The 33rd Annual Meeting of the Society for Medical Decision Making
Oral Abstract Sessions

Saturday, October 22, 2011

PRE-MEETING DINNER SYMPOSIUM

5:30 PM - 9:00 PM: Sat. Oct 22, 2011
Regency CD (Hyatt Regency Chicago)
Session Chairs:

- *Scott B. Cantor, PhD*

Abstracts:

THE DISCOVERY, FINANCING AND EVALUATION OF GENOMIC MEDICINE: IMPLICATIONS FOR THE COMPARATIVE EFFECTIVENESS OF CANCER CARE

5:30 PM - 5:45 PM: Sat. Oct 22, 2011
Regency CD (Hyatt Regency Chicago)
Part of Session: PRE-MEETING DINNER SYMPOSIUM

J. Jack Lee, PhD, MD, DDS, *University of Texas M. D. Anderson Cancer Center , Houston, TX, Tomas J. Philipson, PhD, The Harris School, The University of Chicago, Chicago, IL and Mark J. Ratain, MD, The University of Chicago, Chicago, IL*

This symposium features leading experts in genomic medicine applied to cancer drawn from different disciplines: clinical discovery, trial design, economics, safety and efficacy assessments and comparative effectiveness research. Through formal comments and moderated group discussion, we aim to provide the SMDM audience an introduction to the emerging role each of these disciplines play in the design, implementation and use by decision makers of future comparative effectiveness research on genomic medicines. We will explore the importance of scientific evidence complemented by patient, family and provider perspectives on the practical implications of genomic medicine.

Speakers:
J. Jack Lee, PhD, will discuss adaptive clinical trial design in "personalized" cancer trials.

Tomas J. Philipson, PhD, will discuss the incentives for research and development of personalized medicines from a private pharmaceutical firm's perspective, FDA regulatory assessments, reimbursement and coverage decision making for personalized medicines.

Mark J. Ratain, MD, will discuss drug discovery, establishing the clinical value of personalized medicine, adoption of new tests and medicines from a physician's perspective.

Monday, October 24, 2011

SMDM KEYNOTE PRESENTATION

8:45 AM - 10:00 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)

Abstracts:

BEHAVIORAL ECONOMICS AND CONFLICTS OF INTEREST

8:45 AM - 10:15 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SMDM KEYNOTE PRESENTATION

George Loewenstein, PhD, *Carnegie Mellon University, Pittsburgh, PA*

A conflict of interest is a clash between an individual's professional responsibilities and their personal, typically financial, interests. Traditional economics has not shed much light on conflicts of interest, perhaps in part because it has not recognized the importance of professionalism as a motive in human behavior. In this talk I will present results from a variety of studies that examine the behavioral economics of conflict of interest. Focusing mainly on conflicts of interest in medicine, some of the research shows how people who care deeply about behaving in a professional fashion can be corrupted by economic incentives. Other research shows how disclosing conflicts of interest, far from helping the recipient of information, can backfire, helping the advice-giver and hurting the advice recipient.

TR1. CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

10:30 AM - 12:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Daniel Polsky, PhD*
- *Mark S. Roberts, MD, MPP*

Session Summary:

10:30 AM - 10:48 AM

TR1-1. THE USE OF PERSUASION IN PRIMARY CARE VISITS AND ITS EFFECT ON ADHERENCE TO PHYSICIAN-RECOMMENDED COLORECTAL CANCER SCREENING

10:48 AM - 11:06 AM

TR1-2. FACTORS INFLUENCING PHYSICIANS' THERAPEUTIC DECISION WHEN PRESCRIBING CHEMOTHERAPY: A DISCRETE CHOICE EXPERIMENT

11:06 AM - 11:24 AM

TR1-3. ANXIETY AS AN IMPETUS FOR ACTION: ON THE RELATIVE INFLUENCE OF BREAST CANCER RISK AND BREAST CANCER ANXIETY ON CHEMOPREVENTION DECISIONS

11:24 AM - 11:42 AM

TR1-4. COMMITMENT TO EXERCISE: NUDGED TO EXERCISE? OR TO REVEAL YOUR TRUE COLORS?

11:42 AM - 12:00 PM

TR1-5. MODELING MEDICATION ADHERENCE BEHAVIOR IN COST-EFFECTIVENESS ANALYSIS: THE JUPITER EXAMPLE

Abstracts:

TR1-1. THE USE OF PERSUASION IN PRIMARY CARE VISITS AND ITS EFFECT ON ADHERENCE TO PHYSICIAN-RECOMMENDED COLORECTAL CANCER SCREENING

10:30 AM - 10:48 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

Tracy Wunderlich, MA[1], Greg Cooper, MD[2], George Divine, PhD[1], Susan A. Flocke, PhD[2], Nancy Oja-Tebbe, BS[1], Kurt Stange, MD[2], Laura A. Siminoff[3] and Jennifer Elston Lafata, PhD[3], (1)Henry Ford Health System, Detroit, MI, (2)Case Western Reserve University, Cleveland, OH, (3)Virginia Commonwealth University, Richmond, VA

Purpose: Many approaches used by physicians during the medical encounter have the potential to affect patient adherence to recommendations for preventive health services. Persuasion is one approach defined as a principal method of inducing compliance (Chayes et al. 1995). However, more recent findings suggest that the use of persuasion may be detrimental (Barton et al. 2009). We evaluate the frequency with which physicians use persuasion when recommending colorectal cancer (CRC) screening, patients' perceptions of physician use of persuasion, and how each impacts adherence to physician-recommended CRC screening.

Method: Direct observation of periodic health exams (N=415) in 2007-2009 among primary care patients aged 50-80 due for CRC screening. Qualitative content analyses were used to code office visit audio-recordings for physician use of persuasion (Siminoff et al. 2011). A post-visit survey collected patient perceptions of the use of persuasion by their physician (Burgoon et al. 1984). Post-visit CRC screening use was compiled via claims data. Generalized estimating equations were used to evaluate the association of coded and perceived persuasion with each other as well as with CRC screening.

Result: Content analyses revealed that persuasion occurred in 73% of the visits. Among visits with observer-coded persuasion, most frequently used was argument (45%), followed by argument and refutation combined (21%). Patient perceptions of physician persuasion were significantly ($p<0.05$) associated with coded physician use of persuasion. Regardless of whether persuasion was observer-coded or patient-reported, neither was associated with subsequent CRC screening use.

Conclusion: While persuasion is frequently used when physicians recommend CRC screening and patients acknowledge when their physician attempts to persuade them, our findings indicate that persuasion is not associated with screening use. Further research is needed to better understand patient perceptions of physician persuasion and better ways to communicate recommendations for potentially life-saving preventive services.

TR1-2. FACTORS INFLUENCING PHYSICIANS' THERAPEUTIC DECISION WHEN PRESCRIBING CHEMOTHERAPY: A DISCRETE CHOICE EXPERIMENT

10:48 AM - 11:06 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

Laure Benjamin, MPH, *University of Paris Descartes, School for Public Health (EHESP), GlaxoSmithKline, Marly le Roi, France, François-Emery Cotte, PharmD, PhD, GlaxoSmithKline, Marly le Roi, France, Caroline Philippe, MPH, Qualees, Poissy, France, Florence Mercier, MSc, StatProcess, Port-Mort, France, Thomas Bachelot, MD, Centre Léon Bérard - Inserm U590, Lyon, France and Gwenaëlle Vidal-Trecan, MD, PhD, University of Paris Descartes, Faculty of Medicine, Paris, France*

Purpose: Despite guidelines on cancer management, the increasing availability of targeted therapies has deeply challenged classical patterns of cancer treatment. Our objective was to analyze the relative influence of efficacy, tolerability, adherence and route of chemotherapy administration on medical decision-making.

Method: A Discrete Choice Experiment was performed among 203 French physicians involved in cancer treatment (i.e oncologists, haematologists and physicians qualified in oncology). In a questionnaire of six scenarios, respondents were asked to choose between two treatments which differed with respect to four attributes: efficacy, tolerability, adherence and route of administration. Three of those attributes (efficacy, tolerability and adherence) had two modalities (good vs. moderate) and the later (route of administration) had three modalities (intravenous, oral and oral with a patient support program). To analyze the effect of the therapeutic goal on physicians' preferences, the six scenarios were first presented for curative setting then for palliative setting. The attributes presented in the questionnaire were drawn from a literature review submitted to expert opinion. The effects of each attribute on physicians' preferences were analyzed using conditional logistic regression models.

Result: The efficacy attribute was the predominant criteria in choosing a chemotherapy treatment either in curative setting (moderate vs. good: $\beta=-2.1145$, $p<0.0001$) or in palliative setting (moderate vs. good: $\beta=-$

1.0628, p <0.0001). The route of administration had a positive effect in palliative setting, for which physicians preferred the oral route (β=0.6125, p<.0.003) particularly in the haematologists group. Removing the efficacy attribute of the model, we found that tolerability (moderate vs. good: β=-1.2277, p<0.0001) and adherence had also significant effects on decision (moderate vs. good: β=-1.2228, p<0.0001) but only for curative treatment, and that the oral route with a patient support program remained decisive in palliative setting (β=0.431, p<0.0001).

Conclusion: Our results highlights a consensus on the priority of the efficacy attribute reflecting a good compliance of physicians to guidelines. On condition of equivalent efficacy between two treatments, the oral route of administration was the only criteria considered in palliative setting. This is consistent with the priority to maintain patient's quality of life by staying at home at the advanced-stage of disease. *Financial disclosure: Funding for the study was provided by GlaxoSmithKline and had no influence on the study design, execution and publication of results.*

TR1-3. ANXIETY AS AN IMPETUS FOR ACTION: ON THE RELATIVE INFLUENCE OF BREAST CANCER RISK AND BREAST CANCER ANXIETY ON CHEMOPREVENTION DECISIONS

11:06 AM - 11:24 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

Laura Scherer, PhD[1], Amanda J. Dillard, PhD[2], Peter A. Ubel, MD[3], Dylan Smith, PhD[4], Sarah M. Greene, MPH[5], Jennifer B. McClure, PhD[5], Sharon M. Hensley Alford, PhD[6] and Angela Fagerlin, PhD[7], (1)VA HSR&D and University of Michigan, Ann Arbor, MI, (2)Grand Valley State University, Allendale, MI, (3)Duke University, Durham, NC, (4)Stony Brook University, Stony Brook, NY, (5)Group Health Research Institute, Seattle, WA, (6)Henry Ford Health System, Detroit, MI, (7)Internal Medicine, Ann Arbor, MI

Purpose: Women who are at high risk for breast cancer have the option of taking drugs that can reduce their risk (e.g. Tamoxifen). One question is what factors determine women's interest in chemoprevention. All else equal, women who have higher breast cancer risk should show more interest in chemoprevention. However, women's *anxiety* about breast cancer may also play a significant role in this decision, above and beyond actual or perceived risk.

Method: 623 women who were at above average risk for breast cancer (Gail score > 1.66) were recruited to participate in a test of a decision aid (DA) for Tamoxifen. All women read a decision aid, which provided them with their personalized breast cancer risk (i.e. Gail score), and also provided tailored statistics about the risks and benefits of chemoprevention. Women were asked to report their perceived risk level, as well as their anxiety about developing breast cancer. Finally, women were asked about their interest in chemoprevention.

Result: Actual risk (Gail score) did not predict interest in chemoprevention (p > .05). However, both women's *perception* of risk and *anxiety* about breast cancer significantly predicted interest in chemoprevention. Regression analyses revealed that anxiety was a relatively strong predictor of interest, even when controlling for both actual and perceived risk (b = .31, p < .01). By contrast, perceived risk was a significant yet much smaller predictor of interest, when controlling for actual risk and anxiety (b = .13, p < .01).

Conclusion: In the context of chemoprevention, actual risk does not predict interest in chemoprevention, and perceived risk only weakly predicts interest. By far the strongest predictor of interest in chemoprevention was anxiety about breast cancer: Women with more anxiety were more likely to be interested in chemoprevention, regardless of their actual or perceived risk. These data reveal that anxiety can play an important role in decision-making about chemoprevention, and can potentially bias patients. It could be helpful for DAs to provide information that decreases anxiety in low-risk individuals, so that they do not undergo medical interventions unnecessarily. On the other hand, it may be necessary to modestly *raise* anxiety in high-risk individuals, so that they are moved to act.

TR1-4. COMMITMENT TO EXERCISE: NUDGED TO EXERCISE? OR TO REVEAL YOUR TRUE COLORS?

11:24 AM - 11:42 AM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

Jeremy D. Goldhaber-Fiebert, PhD, *Stanford University, Stanford, CA and Alan M. Garber, MD, PhD, Veterans Affairs Palo Alto Health Care System and Stanford University, Stanford, CA*

Purpose: Regular exercise offers an important solution to the growing burden of obesity-related chronic disease. We evaluated the use of commitment contracts and nudges to promote habitual exercise, focusing on the duration of the contracts and the heterogeneity of individual responses to these behavioral economic devices.

Methods: A randomized controlled trial examined the use of a web-based tool for creating exercise commitment contracts for 3,179 adults (aged 18-77) between September, 2010 and April, 2011. Individuals were randomized to be shown different default contract durations (8 weeks, 12 weeks, or 20 weeks) which they could easily change if they wished. After also choosing the number of exercise sessions per week (frequency) and financial penalty for failing to complete each week, each individual who ultimately signed a contract was followed for the duration of the contract, with weekly reports of their success in meeting exercise goals. For this analysis, follow-up through 13 weeks was available for 1,268 individuals representing 12,574 person-weeks. We analyzed the data using nonlinear multivariable regressions based on a theoretical model of active choice in the context of nudges.

Results: Longer duration nudges increased the mean duration of contracts chosen (13.5 weeks, 14.7 weeks, 18.6 weeks) without altering the likelihood of signing a contract (~70% for all arms), chosen exercise frequency (3.98, 3.93, 3.94 sessions per week), or chosen financial incentives ($6.90, $6.09, $6.81 per week). Based on our active choice model, more than 40% of users were highly susceptible to contract duration nudges, with the greatest effect for individuals interested in contract durations near the nudged defaults. For individuals signing contracts, those nudged to longer contract durations completed statistically more exercise, though this was largely attributable to longer follow-up as success rates did not vary across nudges. Approximately 40% did not complete any exercise sessions (early drop-outs). Early drop-outs were more likely to have accepted the exact nudged duration presented to them.

Conclusions: Individuals can be "nudged" to select contracts with more total exercise. Random use of nudges also causes individuals to reveal two related aspects of their true colors: 1) their activity/passivity of exercise choice; and 2) their likelihood of failing to live up to their exercise commitments. Recognition of such heterogeneity can guide the design of more efficient exercise interventions.

TR1-5. MODELING MEDICATION ADHERENCE BEHAVIOR IN COST-EFFECTIVENESS ANALYSIS: THE JUPITER EXAMPLE

11:42 AM - 12:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 1 - DECISION PSYCHOLOGY AND QUANTITATIVE METHODS

Julia F. Slejko, BA[1], *Patrick W. Sullivan, PhD*[2], *Kavita V. Nair, PhD*[1], *P. Michael Ho, MD, PhD*[3], *Heather D. Anderson, PhD*[1] *and Jonathan D. Campbell, PhD*[1], *(1)University of Colorado School of Pharmacy, Aurora, CO, (2)Regis University, Denver, CO, (3)University of Colorado and US Department of Veterans Affairs, Denver, CO*

Purpose: Because real-world patients may not exhibit the same level of medication adherence seen in clinical trials, the effectiveness of medications in routine practice may differ. Cost-effectiveness analysis (CEA) models often do not incorporate adherence variation. Furthermore, the Markovian assumption does not allow adherence history to affect future event probabilities. We created a framework incorporating adherence history into a Markov model using the example of Justification for the Use of Statins in Prevention: an Intervention Trial Evaluating Rosuvastatin (JUPITER).

Method: Prescription claims records for primary prevention statin users were obtained using the IMS LifeLink Health Plan Claims Database. Yearly adherence was measured as the proportion of days covered (PDC) for three years following statin initiation and was categorized as A0 (PDC=0), A1 ($0 < PDC \leq .33$), A2 ($.33 < PDC \leq .66$), or A3 (PDC>.66). Yearly adherence transitions were incorporated into a Markov microsimulation using TreeAge software. Tracker variables and global matrices stored adherence transitions which were used to adjust statin costs and subsequent probabilities of cardiovascular events over the patient's lifetime. Statin effectiveness was adjusted between 0% (level A0) and 100% (level A3) of trial-based risk reduction. 10,000 microsimulations were used to estimate incremental cost-effectiveness ratios (ICERs) as US dollars per quality-adjusted life-year (QALY). The model was an extension of the authors' previously published JUPITER CEA model in which adherence was not incorporated ("adherence-naïve").

Result: Among 27,862 new statin users, 58% began the first year of statin use in level A3, while 20% and 22% were in levels A2 and A1, respectively. By year three, we found a significant decrease in adherence. 32% of patients were in level A3, 15% in A2, 20% in A1 and 33% in A0. The model incorporating adherence resulted in an ICER of $23,459/QALY while the ICER of the adherence-naïve model was $11,127/QALY. Patient subgroup analysis revealed that the ICER for patients beginning in level A1 was $52,214/QALY while the ICER for patients beginning in level A3 was $17,578/QALY. The ICER for patients remaining in level A3 for three years was $8,347/QALY.

Conclusion: Patient-level simulations that include adherence behavior reveal value differences not seen in a cohort model based on the "average" patient. In the interest of patient-centered outcomes research and personalized medicine, this approach adds insight to how patient subgroups may benefit from adherence-improving interventions.

TR2. CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

10:30 AM - 12:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *Anirban Basu, PhD*
- *David O. Meltzer, MD, PhD*

Session Summary:

10:30 AM - 10:48 AM

TR2-1. COST-EFFECTIVENESS AND PUBLIC HEALTH/BUDGET-IMPACT OF FFR-GUIDED PCI IN MULTIVESSEL PATIENTS IN 6 EUROPEAN COUNTRIES - ANALYSIS ALONG THE FAME TRIAL DATA

10:48 AM - 11:06 AM

TR2-2. EFFECTIVENESS AND COST EFFECTIVENESS OF ORAL PRE-EXPOSURE PROPHYLAXIS FOR INJECTION DRUG USERS IN MIXED HIV EPIDEMICS

11:06 AM - 11:24 AM

TR2-3. INTERNAL VALIDATION AND CALIBRATION OF A MODEL TO FORECAST HIV TREATMENT DEMAND AND CAPACITY IN HAITI

11:24 AM - 11:42 AM

TR2-4. GENE EXPRESSION PROFILING FOR GUIDING ADJUVANT CHEMOTHERAPY DECISIONS IN WOMEN WITH EARLY BREAST CANCER: A COST-EFFECTIVENESS ANALYSIS OF 1000 STRATEGIES FOR THE PROVISION OF ADJUVANT! ONLINE, 21-GENE ASSAY AND CHEMOTHERAPY

11:42 AM - 12:00 PM

TR2-5. ESTIMATING UTILITIES FOR CHRONIC KIDNEY DISEASE IN PATIENTS WITH TYPE 2 DIABETES USING TRANSFORMED SF-36 AND SF-12 RESPONSES: CHALLENGES IN A VETERAN POPULATION

Abstracts:

TR2-1. COST-EFFECTIVENESS AND PUBLIC HEALTH/BUDGET-IMPACT OF FFR-GUIDED PCI IN MULTIVESSEL PATIENTS IN 6 EUROPEAN COUNTRIES - ANALYSIS ALONG THE FAME TRIAL DATA

10:30 AM - 10:48 AM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

Uwe Siebert, MD, MOH, MSc, ScD[1], *Bernhard Bornschein, MD, MPH*[2], *Marjan Arvandi, MS*[2], *Raffaella M. Gothe, MS*[2] *and European Clinical Expert Panel Economic Evaluation FAME Study*[2], *(1)UMIT-Univ. for Health Sciences,Medical Informatics and Technology; Harvard School Public Health, Harvard Medical School, Boston, Hall i.T., Austria, (2)UMIT - University for Health Sciences, Medical Informatics and Technology, Hall i.T., Austria*

Purpose: The FAME Study, an international multicenter RCT (n=1005), demonstrated significant health benefits for patients undergoing multivessel percutaneous coronary intervention (PCI) guided by fractional flow reserve (FFR) measurement compared with PCI guided by angiography alone (ANGIO). The aim of our study was to determine the cost-effectiveness as well as the public health and budget impact for six European countries.

Method: All analyses were performed for patients with multivessel disease comparing FFR vs. ANGIO, based on the original patient-level data of the FAME Study (Tonino et al., NEJM2009). The following analyses were performed for Germany, UK, Italy, France, Belgium and Switzerland. In the prospective cost-effectiveness analyses, we calculated the incremental cost-effectiveness ratios (ICER) in Euro/QALY gained during 1 year adopting the societal perspective. Utilities were measured with country-specific EQ-5D or Torrance-transformed European weights, respectively. Costs were based on country-specific prices and DRGs. The public health and budget impact analysis was based on national PCI registries and performed from the national payer's perspective over a budget period of two years. Variability was estimated using the Bootstrap method (n=5000 samples) and extensive sensitivity analysis.

Result: In the FAME trial, major adverse cardiac events at 1 year occurred in 13.2% of patients in the FFR arm and 18.3% of patients in the ANGIO arm (p=0.02). For all six countries, FFR was cost-saving compared to ANGIO. Bootstrap simulation indicated FFR being cost saving in 52-73% and cost effective in 89-92% at a threshold of 50,000 EUR/QALY gained. Mean savings per patient range from 300 EUR (Germany) to 900 EUR (France). The 2-year public health impact due to the use of FFR ranged was largest for Germany with more than 500 deaths avoided, more than 2000 major cardiac events avoided, and 380 QALYs gained. The 2-year budget impact ranges from less than 1 million to more than 27 million EUR total cost savings depending on the country. Sensitivity analyses showed that prices of FFR pressure wire and drug-eluting stents were most influential, determining whether FFR is cost-effective or cost-saving.

Conclusion: In the health care systems of Germany, UK, Italy, France, Belgium and Switzerland, FFR-guided PCI in patients with multivessel coronary disease substantially reduces cardiac events, improves QALYs and is cost saving.

TR2-2. EFFECTIVENESS AND COST EFFECTIVENESS OF ORAL PRE-EXPOSURE PROPHYLAXIS FOR INJECTION DRUG USERS IN MIXED HIV EPIDEMICS

10:48 AM - 11:06 AM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

Sabina S. Alistar, MS, *Stanford University, Stanford, CA*

Purpose: Pre-exposure prophylaxis with oral antiretroviral treatment (oral PrEP) for HIV-uninfected injection drug users (IDUs) is potentially useful in controlling HIV epidemics with a significant injection drug use component. The role oral PrEP in portfolios of interventions including methadone maintenance therapy (MMT) for drug users and antiretroviral treatment (ART) for infected individuals is unknown. We estimated the effectiveness and cost effectiveness of strategies for using oral PrEP (up to 50% of uninfected IDUs) in various combinations with MMT (25% of IDUs) and ART (80% of all eligible patients) in Ukraine, a representative case for mixed HIV epidemics.

Method: We expanded a previously developed dynamic compartmental model of the HIV epidemic in a population of non-IDUs, IDUs who inject opiates, and IDUs on methadone, adding an oral PrEP program (tenofovir, 50% susceptibility reduction) for uninfected IDUs. The model was populated with data from Ukraine. We modeled 1,000,000 individuals aged 15-49 stratified by HIV status and injection drug use. We analyzed packages of interventions consisting of MMT, ART and oral PrEP. We measured health care costs, quality-adjusted life years (QALYs), HIV prevalence, HIV infections averted, and incremental cost effectiveness.

Result: Without incremental interventions, after 20 years HIV prevalence reached 67.3% in IDUs and 0.9% in non-IDUs. A combination of MMT and oral PrEP for 25% of IDUs lowered HIV prevalence the most in both IDUs (46.2%) and the general population (0.7%). ART (80% access for eligible infected individuals), combined with MMT (25% of IDUs) and oral PrEP (25% of uninfected IDUs) averted the most infections (10,700), followed by ART (80% access) and oral PrEP (50% access), with 8,900 infections averted. The most cost-effective strategy was MMT (25% of IDUs), gaining 76,000 QALYs versus no intervention, at $530/QALY gained. The next most cost-effective strategy consisted of MMT (25% of IDUs) and ART (80% access), at $1,120/QALY gained. Further adding oral PrEP (25% access) was also cost-effective, at $12,240/QALY gained. Oral PrEP alone became cost-effective for annual PrEP costs comparable to annual HIV care costs.

Conclusion: Oral PrEP can be part of cost-effective intervention packages to control HIV epidemics where injection drug use is significant. Where budgets are limited, focusing on MMT and ART access should be the priority. Oral PrEP alone may become highly cost-effective if costs decline significantly.

TR2-3. INTERNAL VALIDATION AND CALIBRATION OF A MODEL TO FORECAST HIV TREATMENT DEMAND AND CAPACITY IN HAITI

11:06 AM - 11:24 AM: Mon. Oct 24, 2011
*Grand Ballroom CD (Hyatt Regency Chicago)*
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

April D. Kimmel, PhD[1], Daniel W. Fitzgerald, MD[1], Macarthur Charles, MD, PhD[1], Alison Edwards, MStat[1], Abdias Marcelin[2], Jean W. Pape, MD[3] and Bruce R. Schackman, PhD[1], (1)Weill Cornell Medical College, New York, NY, (2)Les Centres GHESKIO, Port-au-Prince, Haiti, (3)Les Centres GHESKIO, Weill Cornell Medical College, New York, NY

Purpose: International guidelines recommend early HIV treatment initiation (i.e., at CD4 <350) for HIV-infected individuals in resource-limited settings. However, funding availability for early or deferred HIV treatment (i.e., at CD4 <200) in Haiti is uncertain. We aimed to internally validate and calibrate a user-friendly model of HIV disease in Haiti that will assist policy makers in forecasting treatment need and capacity.

Methods: We used patient-level data from Haitian observational cohorts and a randomized trial conducted in Haiti to develop a computer-based, mathematical model of HIV disease. Incidence density analysis was used to derive model parameters for untreated HIV disease progression (HIV seroconverters cohort, n=41; asymptomatic HIV disease, n=436) and HIV treatment (early 1st-line treatment, n=408, deferred 1st-line treatment, n=910; deferred 2nd-line treatment, n=194). Model predictions were compared to observed data to assess internal validity. Goodness of fit measures included visual assessment of Kaplan-Meier survival curves, comparisons of 5-year event probability, and percentage deviation between the predicted estimates and observed data at discrete time points, averaged over time. When model predictions did not exhibit a good fit due to model structure simplifications that would enhance usability, an internal calibration algorithm was applied to improve goodness of fit between predicted and observed outcomes. The model was implemented in Microsoft Excel, and results evaluated over a 5-and 10-year policy time horizon.

Results: For a cohort of newly HIV-infected individuals with no access to HIV treatment, the model predicts median AIDS-free survival of 9.0 years pre-calibration and 5.6 years post-calibration versus 5.8 years (95% CI 5.1, 7.0) observed (**Figure 1**). For a cohort of patients initiating deferred treatment, the model estimates 23.2% would die by 5 years (versus 23.5% in the observed data), 7.3% would be lost from care (versus 7.8%), and 11.7% would initiate a second treatment regimen (versus 10.8%). In 12 out of 14 comparisons assessing different natural history and treatment-related outcomes, mean percentage deviation between the model predictions and observed data does not exceed 5% over both 5 and 10 years.

Figure 1. Kaplan-Meier AIDS-free survival
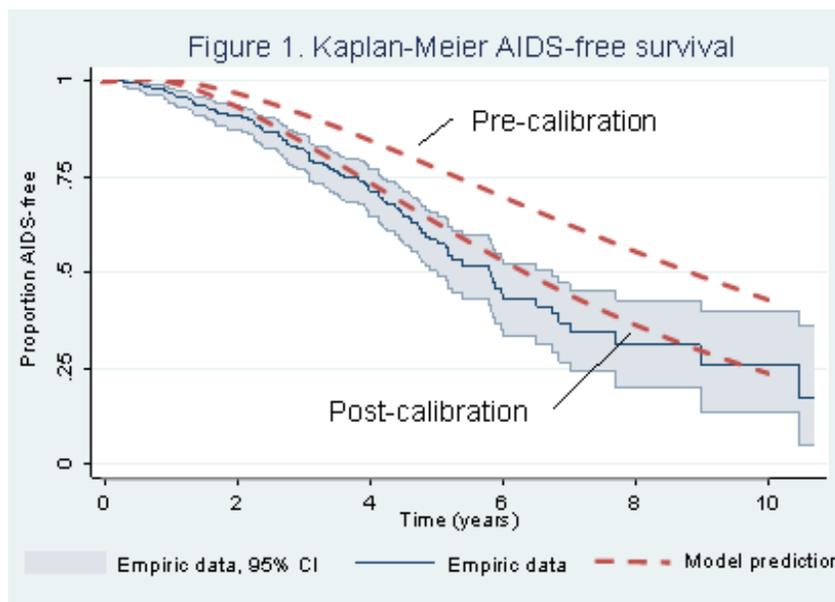
Conclusions: Internal validation and calibration results were sufficient for 5- and10-year health policy decision making. Using local data in a model-building process can improve validity and acceptability of policy models in resource-limited settings.

TR2-4. GENE EXPRESSION PROFILING FOR GUIDING ADJUVANT CHEMOTHERAPY DECISIONS IN WOMEN WITH EARLY BREAST CANCER: A COST-EFFECTIVENESS ANALYSIS OF 1000 STRATEGIES FOR THE PROVISION OF ADJUVANT! ONLINE, 21-GENE ASSAY AND CHEMOTHERAPY

11:24 AM - 11:42 AM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

Mike Paulden, MA., MSc.[1], Jacob Franek, MHSC[2], Ba Pham, MSc[1] and Murray D. Krahn, MD, MSc[1], (1)University of Toronto, Toronto, ON, Canada, (2)Ontario Ministry of Health and Long-Term Care, Toronto, ON, Canada

Purpose: Adjuvant chemotherapy decisions for women with early-stage breast cancer are complex. the 21-gene assay, a gene expression profiling test, is validated at predicting distant recurrence-free response in patients with ER+ LN- early-stage breast cancer. This enables chemotherapy to be better targeted at higher risk patients than is possible through the use of Adjuvant! Online (AOL) or clinical judgement alone. However, existing cost-effectiveness analyses of the 21-gene assay have numerous limitations: in particular, they consider a limited range of strategies and do not separately consider intermediate risk patients identified through either AOL or the 21-gene assay. Our objective was to build an Ontario-based cost-effectiveness analysis which comprehensively addresses these limitations.

Method: We built upon a Markov model developed by Tsoi and colleagues, using data from the NSABP B-14 and B-20 clinical trials. We assumed that AOL and the 21-gene assay may be provided separately or sequentially and considered the chemotherapy decision separately for every possible risk group, resulting in 1000 unique strategies for the provision of AOL, the 21-gene assay and chemotherapy.

Result: The 21-gene assay appears cost-effective for all patients, regardless of a patient's initial AOL risk assessment. The highest ICER is in patients at low AOL risk ($29,000 per QALY), while the 21-gene assay dominates in patients at high AOL risk. Chemotherapy appears cost-effective only in patients at intermediate or high 21-gene assay risk. The highest ICER is in patients at low AOL and intermediate 21-gene assay risk ($64,000 per QALY). Chemotherapy is dominated in patients at low 21-gene assay risk.

Conclusion: The 21-gene assay appears to be cost-effective for all Ontario women with ER+ LN- early-stage breast cancer, regardless of the woman's initial AOL risk assessment. These results have informed the Ontario Health Technology Advisory Committee's recent deliberations regarding the funding of the 21-gene assay in Ontario.

TR2-5. ESTIMATING UTILITIES FOR CHRONIC KIDNEY DISEASE IN PATIENTS WITH TYPE 2 DIABETES USING TRANSFORMED SF-36 AND SF-12 RESPONSES: CHALLENGES IN A VETERAN POPULATION

11:42 AM - 12:00 PM: Mon. Oct 24, 2011
*Grand Ballroom CD (Hyatt Regency Chicago)*
Part of Session: CONCURRENT PRESENTATION OF TOP-RANKED ABSTRACTS - 2 - HEALTH SERVICES, ECONOMICS AND POLICY

Mangala Rajan, MBA[1], Chin-Lin Tseng, DrPH[1], Alfredo Selim, MD, MPH[2], Shirley Qian, MS[2], Lewis Kazis, ScD[2], Leonard Pogach, MD, MBA[1] and **Anushua Sinha, MD, MPH[3]***, (1)East Orange Veterans Administration Medical Center, East Orange, NJ, (2)Boston University, Boston, MA, (3)University of Medicine and Dentistry of New Jersey - New Jersey Medical School, Newark, NJ*

Purpose: To compare four previously-published methods of transforming Short Form 36 and 12 Item Health Surveys (SF-36 /SF-12) data into utilities, using survey responses from veterans with diabetes (DM) and chronic kidney disease (CKD); to determine if these transformations are valid for discriminating utility losses (disutilities) as CKD severity increases; and to estimate the disutility associated with progressive CKD.

Methods: Veterans with DM were selected who responded to the Large Veterans Health Survey in 1999 and divided into those with recent-onset DM (duration of ≤3 years) and prevalent DM (duration >3 years). Surveys were merged with data from the Diabetes Epidemiology Cohort, a well-established longitudinal cohort of veterans with diabetes. ICD-9 and procedure codes determined if respondents were on dialysis or had end-stage renal disease (ESRD). If subjects did not have ESRD/dialysis, serum creatinines were used to stage CKD. Four previously-published SF-36 /SF-12-to-utility transformations (A = SF-12 to SF-6D, B = SF-36 to SF-6D, C = SF-36 to HUI2, D= SF-12 to VR-6D) were used to estimate utilities (U) for each respondent. Generalized linear regression models estimated the disutility associated with each CKD stage, after adjustment for demographics, socio-economics, and co-morbidities.

Results: Of 67,694 diabetic patients, 22,273 had recent-onset and 45,691 patients had prevalent DM. The figure gives mean utilities by each method for recent-onset DM patients; results were similar for prevalent DM. Method A did not discriminate utility by CKD stage, among either recent-onset or prevalent diabetics. The remaining three methods showed a stepwise decline in utility as CKD stage increased. The rank order was consistently U(A)>U(C)>U(B)>U(D). In recent-onset DM, mean disutilities associated with increasing CKD stage differed significantly by transformation method (p<0.0001) and ranged between 0.0017 - 0.0042, -0.0067 - -0.0019, -0.0256 - -0.0041, and -0.0116 - -0.0091 for CKD stages 2, 3, 4/5, and ESRD/dialysis respectively; results were similar for prevalent DM.

Figure. Mean utility values (95% CI), recent-onset DM patients
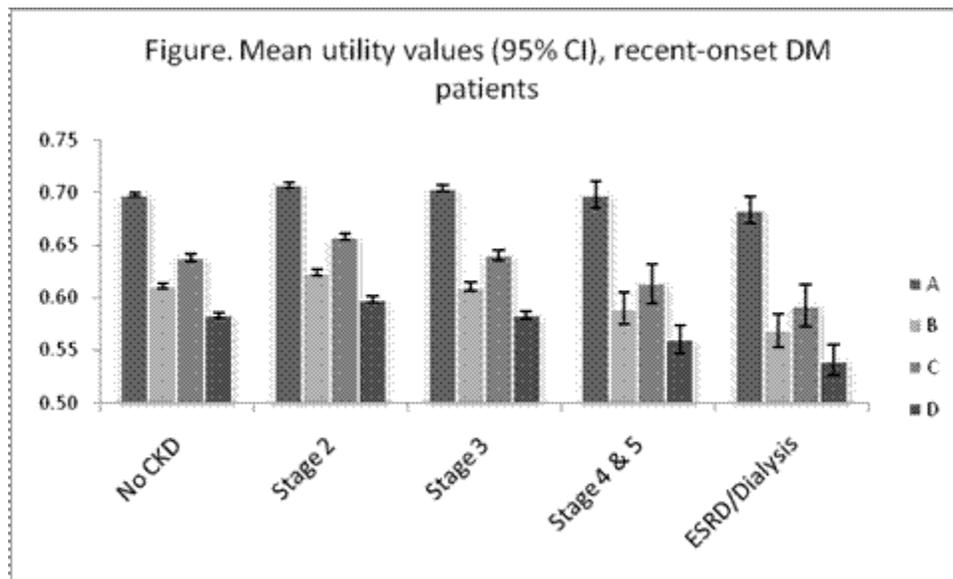
Conclusions: In a cross-sectional analysis of diabetic veterans, systematic differences were found in utilities estimated using four transformations of SF-36 /SF-12 data. In particular, method A may not capture all available SF-36 information, resulting in inconsistent utility estimates relative to other methods. CKD-associated disutility values differed significantly between methods at each CKD stage, suggesting that selection of transformation method requires careful consideration of potential floor and ceiling problems.

CONCURRENT ORAL SESSION A:

1:30 PM - 3:00 PM: Mon. Oct 24, 2011

A. DECISION PSYCHOLOGY LUSTED FINALISTS

1:30 PM - 3:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Sophie Desroches, RD, PhD*
- *Marla L. Clayman, PhD, MPH*

Session Summary:

1:30 PM - 1:45 PM

A-1. PATIENT PARTICIPATION IN DECISION MAKING ABOUT DISEASE MODIFYING ANTI-RHEUMATIC DRUGS: PERCEIVED AND PREFERRED ROLES OF PATIENTS

1:45 PM - 2:00 PM

A-2. INACCURATE EXPECTATIONS? AFFECTIVE FORECASTING IN THE CONTEXT OF ELECTIVE HYSTERECTOMY

2:00 PM - 2:15 PM

A-3. EFFECTS OF DECISION AIDS ON DECISIONAL CONFLICT ASSOCIATED WITH OSTEOARTHRITIS TREATMENT

2:15 PM - 2:30 PM

A-4. THE WEIGHT OF HISTORY: CAPTURING PROSTATE CANCER RISK AND SCREENING POLICIES FOR MEN WITH AND WITHOUT A FAMILY HISTORY USING A POLICY-CAPTURING APPROACH

2:30 PM - 2:45 PM

A-5. ASSESING PATIENTS' INVOLVEMENT IN DECISION-MAKING DURING A NUTRITIONNAL CONSULTATION WITH A DIETITIAN

2:45 PM - 3:00 PM

A-6. REWARD SENSITIVITY, TEMPORAL DISCOUNTING, GENDER AND RISKY HEALTH BEHAVIORS: A FUZZY-TRACE THEORY APPROACH

Abstracts:

A-1. PATIENT PARTICIPATION IN DECISION MAKING ABOUT DISEASE MODIFYING ANTI-RHEUMATIC DRUGS: PERCEIVED AND PREFERRED ROLES OF PATIENTS

1:30 PM - 1:45 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Ingrid Nota, MSc[1], C.H.C. Drossaert, Dr.[1], E. Taal, Dr.[1], B.C. Visser, MSc[2] and M.A.F.J. Van de Laar, Prof., Dr.[1], (1)University of Twente, Enschede, Netherlands, (2)Medisch Spectrum Twente, Enschede, Netherlands

Purpose: This study explores what role patients with rheumatic diseases perceive and prefer to have in decisions about Disease-Modifying Anti-Rheumatic Drugs (DMARD's) and what the concordance between preferred and perceived role in these decisions is.

Methods: Patients (n=519) diagnosed with Rheumatoid Arthritis, Arthritis Psoriatica or Ankylosis Spondylitis from two hospitals in the Netherlands filled out a questionnaire. Questions included perceived

and preferred role in medical decision making in general, and in four specific decision-categories: starting to use traditional DMARD's, starting to inject a DMARD, starting to use biological DMARD's and decrease or stop using DMARD's.

Results: Most respondents perceived that, in current practice, treatment decisions in general were made by the doctor (43%) or by the doctor and patient together (55%). However, the perceived roles varied per decision-category: e.g. most patients (72%) felt that the decision to start using a traditional DMARD was made by the doctor, whereas the decision to decrease or stop using DMARD's was more often perceived as being made by the patients themselves (24%) or by doctor and patient together (38%). The preferred roles were, contrary to the perceived roles, consistent across the decision-categories. Most respondents (59-63%) preferred to share decisions with their doctor. By using a paired sample t-test the concordance between the perceived and preferred role was evaluated. Table 1 shows that there was a significant difference in 4 of 5 decision-categories. Only the decision to decrease or stop using DMARD's had no significant difference between perceived and preferred role.

Table 1 Perceived and preferred role in medical decision making

Decision	Perceived role			Total		Preferred role			Total		Difference[2]
	Doctor (1)	Shared (2)	Patient (3)	Mean	Valid N	Doctor (1)	Shared (2)	Patient (3)	Mean	Valid N	p
MDM in general	43%	55%	1%	1.6	506	31%	61%	8%	1.8	504	.00
Starting to use traditional DMARD	72%	26%	2%	1.3	368	32%	59%	10%	1.8	491	.00
Starting to inject MTX	43%	40%	17%	1.7	162	25%	60%	15%	1.9	466	.02
Starting to use biological DMARD	44%	50%	6%	1.6	149	26%	63%	11%	1.9	471	.00
Decrease or stop DMARD	38%	38%	24%	1.9	314	30%	61%	9%	1.8	489	n.s.

Perceived role includes respondents who ever faced the decision; Preferred role includes all respondents.

[2] Difference = difference between preferred and perceived role, tested with paired sample t-test.

n.s. = not significant

For a considerable group the perceived and preferred participation for decision making in general matched (61%); about one third (29%) perceived less participation than preferred and a minority perceived more participation than preferred. Again, the concordance varied across the decision-categories. Especially for the decision to start with a traditional DMARD, many respondents had experienced less participation than they preferred (54%).

Conclusions: Although patients seem consistent in their preference for participation in various DMARD-decisions, the amount of perceived participation varied across the different decisions. Patients should especially be more involved in decisions about starting to use a traditional DMARD. Patient Decision aids might be helpful tools to increase patient participation.

A-2. INACCURATE EXPECTATIONS? AFFECTIVE FORECASTING IN THE CONTEXT OF ELECTIVE HYSTERECTOMY

1:45 PM - 2:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Jaclyn C. Watkins, M.S.[1]*, Miriam Kuppermann, PhD, MPH*[2]*, Jodi Halpern, MD, PhD*[3] *and Maureen Lahiff, PhD*[3]*, (1)University of California, San Francisco, Berkeley, CA, (2)University of California, San Francisco, San Francisco, CA, (3)University of California, Berkeley, Berkeley, CA*

Purpose: To assess the accuracy of women's emotional expectations of elective hysterectomy as treatment for noncancerous uterine conditions through the lens of affective forecasting.

Methods: This is a secondary analysis of data collected as part of the Study of Pelvic Problems, Hysterectomy, and Intervention Alternatives, a longitudinal study designed to examine the effects of noncancerous uterine conditions on health-related quality of life and to identify predictors of use of and satisfaction with hysterectomy and alternative treatments. Patients who had sought care for bleeding, pain, and/or pressure at one of several Bay Area hospitals were interviewed annually for up to eight years. For this analysis, only women who had a hysterectomy were included (n=159). The primary predictors and outcomes included agreement scores ranging from 1 to 7 on several 1-item attitude measures phrased as expectations prior to hysterectomy and as outcomes post-hysterectomy. Forecasting ability (tendency to accurately estimate, overestimate, or underestimate affective responses) and an overall hysterectomy expectation score were also outcomes.

Results: Compared to their post-hysterctomy scores, before undergoing hysterectomy, participants reported significantly higher agreement with the following statements: "Having a uterus makes/made me feel complete as a woman" (4.08 v. 3.16; p=<0.001), "My uterus is/was important to my sexual enjoyment" (3.51 v. 2.65; p=<0.001), "Having a hysterectomy would make/made me feel violated" (2.77 v. 2.29; p=0.042), and "Having a hysterectomy would make/made me feel older" (3.36 v. 2.65; p=0.006). They showed significantly less agreement with a statement regarding the benefit of hysterectomy as birth control pre-hysterectomy (4.59 v. 5.20; p=0.008). There was no significant change in response to a statement regarding feeling sad about losing fertility (p=0.955). Multinomial logistic regressions revealed few significant associations between forecasting ability and sociodemographic variables. Notable findings include an association between increased age and accuracy of impact of hysterectomy on sexual enjoyment (relative risk ratio=0.82, CI (0.71, 0.93), p=0.003) and between pre-hysterectomy sexual importance and overestimation of hysterectomy's impact on sexual enjoyment (relative risk ratio=1.93, CI (1.23, 3.02), p=0.004).

Conclusions: Women tend to overestimate the impact of perceived negatives associated with hysterectomy, suggesting the presence of forecasting errors. Further exploration of the specific forecasting errors made in the context of elective hysterectomy would aid in the development of more effective decision tools for women considering hysterectomy.

A-3. EFFECTS OF DECISION AIDS ON DECISIONAL CONFLICT ASSOCIATED WITH OSTEOARTHRITIS TREATMENT

2:00 PM - 2:15 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Sofia de Achaval, MS[1], *Liana Fraenkel, MD, MPH*[2], *Vanessa Cox, MS*[1], *Robert J. Volk, PhD*[1] *and Maria E. Suarez-Almazor, MD, PhD*[1], *(1)The University of Texas MD Anderson Cancer Center, Houston, TX, (2)Yale School of Medicine, New Haven, CT*

Purpose: To examine the impact of a decision aid coupled with an adaptive conjoint analysis (ACA) program on decisional conflict in decision making for treatment of osteoarthritis (OA).

Method: A total of 209 patients with OA in one or both knees who had not undergone total knee arthroplasty (TKA), but had thought about it or had talked to their doctor about it participated in the study (mean age 63 years; 68% female; 66% White). Participants were randomly allocated into one of three groups: 1) a control arm brochure, 2) a DVD-based decision aid, and 3) the same DVD-based decision aid plus the ACA program. The primary outcome measure [decisional conflict scale (DCS)] was evaluated using pre/post intervention self-administered questionnaires along with demographic characteristics and impact of OA on quality of life (KOOS). Statistical analysis included descriptive statistics and analysis of variance (ANOVA) to estimate the effect of the intervention on decisional conflict.

Result: Overall, the intervention statistically significantly reduced decisional conflict in all groups (p<0.05). The difference between the pre and post mean subscale scores for the DCS measured change in the expected direction: decision uncertainty decreased, informativeness increased, values clarity increased, support increased and effective decision increased. The largest reduction in decision conflict was observed for participants in the DVD decision aid group. Post hoc analyses indicated a statistically significant difference in pre vs. post-intervention DCS total score comparing the DVD group to the control group and comparing the DVD group to the DVD plus ACA group (p<0.001). The changes in decision conflict for the control compared to the DVD decision aid plus ACA group were not significantly different.

Conclusion: In this study, the addition of an ACA program to a DVD decision aid did not lead to greater reductions in decisional conflict. Long-term effectiveness is yet to be determined and should take into account additional patient and provider preferences.

A-4. THE WEIGHT OF HISTORY: CAPTURING PROSTATE CANCER RISK AND SCREENING POLICIES FOR MEN WITH AND WITHOUT A FAMILY HISTORY USING A POLICY-CAPTURING APPROACH

2:15 PM - 2:30 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Michelle McDowell, BPsych(hons)[1], *Stefano Occhipinti*[1] *and Suzanne Chambers*[2], *(1)Griffith University, Brisbane, Australia, (2)Griffith University, Gold Coast, Australia*

Purpose: To understand how men integrate information about prostate cancer risks and screening guidelines to make judgements about prostate cancer and exploring whether having a first-degree family history influences how this information is integrated.

Method: First-degree relatives of men with prostate cancer (n=32) and men without a family history of prostate cancer (n=50) from Queensland, Australia completed a policy-capturing study. Forty-eight distinct profiles were created based on a full factorial design utilising four cues: family history (none, brother, father, brother and father), age (40's, 50's, 60's), physician discussion (yes, no), and symptoms (presence, absence). Participants rated each profile according to their perception of the stimulus's prostate cancer risk and whether the stimulus should consider prostate cancer screening.

Result: Multi-level modelling analyses were employed to predict the use of information cues on perceived risk ratings and on prostate cancer screening recommendations and to explore family history status as a moderator of these ratings. Family history, older age, and the presence of urinary symptoms in stimulus profiles were associated with greater judgements of prostate cancer risk by all men. First-degree relatives of men with prostate cancer weighted the family history cue lower in their judgements of risk than did men without a family history. There was minimal variability in the endorsement of prostate cancer screening across profiles and most men recommended screening for all stimulus men regardless of the values of information cues.

Conclusion: Family history is an important information cue for all men in determining judgements of prostate cancer risk. However, first-degree relatives weight the family history cue lower than do men without a family history when making judgements about prostate cancer risk where they consider the specific nature of the family history. First-degree relatives of men with prostate cancer consider the broader context of having a relative with prostate cancer and incorporate this information in determining their judgements which may have implications on the informed decision-making process.

A-5. ASSESING PATIENTS' INVOLVEMENT IN DECISION-MAKING DURING A NUTRITIONNAL CONSULTATION WITH A DIETITIAN

2:30 PM - 2:45 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Hugues Vaillancourt, BSc, *France Légaré, MD, PhD, Annie Lapointe, RD, PhD, Sarah-Maude Deschênes, RD and Sophie Desroches, RD, PhD, CHUQ Research Center-Hospital St-François d'Assise, Knowledge Transfer and Health Technology Assessment, Laval University, Québec, QC, Canada*

Purpose: Little is known about shared decision making (SDM) in diet-related healthcare and clinical practice. Therefore, our objective was to assess the extent to which dietitians involve patients in decisions about their dietary treatment.

Method: We recruited dietitians working in hospitals in the Province of Quebec (Canada). Participating dietitians were asked to identify one patient to be seen during an upcoming consultation and in which a value-sensitive, nutritional treatment decision was expected to occur. All patients consulting for a diet-related health condition were eligible to participate. We audiotaped dietitians conducting nutritional consultations with their patients and we transcribed the tapes verbatim. Three trained raters independently evaluated the content of the nutritional consultations with a coding frame based on the 12 items of the French-language version of the OPTION scale, a validated and reliable third-observer instrument designed to assess patients' involvement by examining specific health professional behaviours. Coding was facilitated by the qualitative research software NVivo 8. We assessed internal consistency with Cronbach's alpha and inter-rater reliability with the intraclass correlation coefficient (ICC).

Result: Of 40 dietitians eligible to participate in the study, 19 took part. All dietitians were women aged between 24 to 60 years old (mean age 39.3 ± 11.0 years).Their mean number of years in dietetic practice was 13.5 ± 9.2. We recruited one patient per participating dietitian. Patients (mean age 40.2 ± 25.2) were consulting for a variety of diet-related health conditions including diabetes, cardiovascular disease, and high risk pregnancy. The overall mean OPTION score was 29 ± 8 (range=0 [no involvement] to 100 [high involvement]). Internal consistency and inter-rater reliability were both good (Cronbach's alpha=0.938; ICC=0.65). Dietitians demonstrated the highest standard of skill for exploring patient's expectations about how to manage the problem and the lowest for assessing the patient's preferred approach to receiving

information to assist decision making. Mean duration of consultations was 50±26min. The OPTION score was positively correlated with the duration of consultation (r=0.65,P<0.01).

Conclusion: Results indicate that dietitians' involvement of patients in decisions about their dietary treatment is suboptimal. Interventions to increase patients' involvement in decisions about their dietary treatment are needed and should include the training of dietitians. *This study was funded by a George Bennett postdoctoral grant from the Foundation for Informed Medical Decision Making awarded to SD (FIMDM 2008-2009, grant #0108-1).*

A-6. REWARD SENSITIVITY, TEMPORAL DISCOUNTING, GENDER AND RISKY HEALTH BEHAVIORS: A FUZZY-TRACE THEORY APPROACH

2:45 PM - 3:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION PSYCHOLOGY LUSTED FINALISTS

Evan A. Wilhelms, *Priscila G. Brust, Valerie Reyna, PhD, Seth T. Pardo, MA and Wilson Sui, Cornell University, Ithaca, NY*

Purpose: To examine relations among intuitive processes (i.e., gist), temporal discounting, sensation seeking (reward sensitivity), and risk-taking in health domains such as alcohol use and food choices, and interactions with gender.

Method: Adults (N=966; 67% female; 37% Minority; mean age 20.2) were surveyed anonymously. Temporal discounting questions were presented for 3 commodities (alcohol, candy bars and money), varying immediate magnitude (1 or 6) and magnitude of the commodity one month later (Which would you choose: 1 candy bar now or 3 candy bars in one month?). Discount rates were calculated for each commodity by magnitude condition. Participants also selected the gist of their decisions from five ordinal options (e.g., Now is always better than later.) and responded to the Brief Sensation Seeking Scale (BSSS). Health behaviors included alcohol use (WHO's Alcohol Use Disorders Identification Test, AUDIT), risk-taking (Adolescent Risk Questionnaire, ARQ), and spending behavior (Spendthrift Scale).

Result: In a regression using gist, discounting, sensation seeking, and gender as predictors of risky behaviors, discounting and gender were not significant by themselves, but discounting interacted with gender. Moreover, gist explained unique variance beyond other predictors. Specifically, health behaviors (AUDIT and ARQ) correlated with alcohol discount rates among males, whereas these behaviors correlated with candy discount rates among females. Similarly, alcohol gist correlated with males' risky behaviors, whereas candy gist correlated with females' risky behaviors. Discounting and reward sensitivity also predicted beyond their domains (e.g., alcohol predicted spending).

Conclusion: Consistent with Fuzzy-Trace Theory, unhealthy risk-taking behaviors were predicted by both reward sensitivity (sensation seeking) and information processing based on gist, each accounting for unique variance in health behaviors. In addition, there was a gender-specific effect in which alcohol predicted better for men, but candy bars predicted better for women. These results are consistent with a theoretical mechanism in which the perception of the gist of choices, as well as individual and group differences in reward salience, each account for unique variance in predicting risk taking and unhealthy choices. Implications for public health messages and medical decision making will be discussed.

B. HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

1:30 PM - 3:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *R. Scott Braithwaite, MD, MSc, FACP*
- *S. Maria E. Finnell, MD*

Session Summary:

1:30 PM - 1:45 PM

B-1. ADHERENCE WITH COLORECTAL CANCER SCREENING: DOES THE WAY YOU MODEL IT MATTER?

1:45 PM - 2:00 PM

B-2. A PRAGMATIC APPROACH FOR ASSESSING PREDICTORS OF MEDICATION ADHERENCE

2:00 PM - 2:15 PM

B-3. INVESTMENT AND DISINVESTMENT OF HEALTH TECHNOLOGIES: THE NEED FOR *TWO* COST-EFFECTIVENESS THRESHOLDS

2:15 PM - 2:30 PM

B-4. COMPARATIVE EFFECTIVENESS RESEARCH AND TECHNOLOGICAL ABANDONMENT

2:30 PM - 2:45 PM

B-5. A FRAMEWORK FOR MEASURING THE VALUE OF QUALITY IMPROVEMENT

2:45 PM - 3:00 PM

B-6. HISTORICAL CONTROLS FOR MORTALITY: R.I.P

Abstracts:

B-1. ADHERENCE WITH COLORECTAL CANCER SCREENING: DOES THE WAY YOU MODEL IT MATTER?

1:30 PM - 1:45 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

Jessica Cott Chubiz, MS, Amy B. Knudsen, Ph.D. and G. Scott Gazelle, MD, MPH, PhD, Massachusetts General Hospital, Boston, MA

Purpose: Modeling adherence with colorectal cancer (CRC) screening is challenging due to limited data on longitudinal adherence patterns. We assessed whether the manner in which imperfect adherence is simulated affects model-predicted conclusions about the effectiveness and cost-effectiveness of CRC screening.

Method: Using a previously-developed microsimulation model of CRC, we predicted the fraction of 50-year-olds ever screened as well as the life-years gained (LYG), lifetime costs, and incremental cost-effectiveness ratios (ICERs) for two CRC screening strategies: five-yearly computed tomographic colonography (CTC) and ten-yearly colonoscopy (COL). We considered four approaches for simulating imperfect adherence (based on approaches used in the literature), each of which could be described as assuming 50% adherence: (1) fraction (50%) perfectly adherent and fraction (50%) completely nonadherent; imperfect random adherence at a constant rate (50%) (2) without and (3) with dropout; and (4) heterogeneity in imperfect adherence with constant rates within population subgroup (population average 50%).

Result: The fractions ever screened were 50% for scenarios 1 and 3, and higher for at least one strategy in scenarios 2 and 4 (Table). In scenarios 1 and 3, COL was more effective than CTC, while in scenarios 2 and 4 CTC was more effective. CTC was the most costly strategy in scenarios 1 and 4 and less costly than COL in scenarios 2 and 3. CTC was dominated in scenario 1, COL was dominated in scenarios 2 and 4, and in scenario 3 the ICER of COL vs. CTC was $8,900/LYG.

Conclusion: The manner in which imperfect adherence is simulated affects the model-predicted relative effectiveness, cost, and cost-effectiveness of CTC vs. COL screening for CRC. To clarify the implications of adherence assumptions in the context of repeated screening, we recommend that modelers report the fraction of the population ever screened with each modality, as well as findings assuming perfect adherence. While unrealistic, the latter output enables direct comparison of alternative screening options among those willing to be screened and facilitates comparisons across models.

Table. Fraction ever screened, LYG and lifetime costs per 1000 50-year-olds, and ICERs by adherence scenario and screening strategy

Adherence scenario	Ever screened, %			LYG vs. NS*			Lifetime costs* (millions $)			ICER ($/LYG)		
	NS	COL	CTC	NS	COL	CTC	NS	COL	CTC	NS	COL	CTC
1	0	50	50	0	60	59	2.799	3.123	3.160	--	5,500 vs. NS	Dominated
2	0	83	93	0	74	83	2.799	2.911	2.875	--	Dominated	1,000 vs. NS
3	0	50	50	0	50	40	2.799	2.919	2.831	--	8,900 vs. CTC	900 vs. NS
4	0	50	54	0	51	54	2.799	2.967	2.969	--	Dominated	3,300 vs. NS

*Discounted at 3% annual rate
– indicates least costly and least effective non-dominated strategy; NS = no screening

B-2. A PRAGMATIC APPROACH FOR ASSESSING PREDICTORS OF MEDICATION ADHERENCE

1:45 PM - 2:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

Bijan J. Borah, Ph.D., *College of Medicine, Mayo Clinic, Rochester, MN*

Purpose: Medication adherence among chronic disease patients has been shown to improve outcomes, which in turn results in reduced overall healthcare costs. A comprehensive understanding of the predictors of adherence is essential to formulate targeted strategies for improving adherence. Existing methods have not considered evaluation of heterogeneous impacts of adherence predictors at different parts (quantiles) of the adherence distribution as defined by medication possession ratio. Using the novel econometric framework of unconditional quantile regression (UQR), this study assesses the heterogeneity of impacts of the adherence predictors for an Alzheimer's disease (AD) population.

Method: This retrospective claims analysis identified AD patients from a large US health plan that initiated oral AD therapy (rivastigmine, donepezil, galantamine, or memantine) between 1/1/2006 and 12/31/2007. Baseline characteristics were assessed during the 6-month pre-index period; medication adherence was assessed during the 1-year post-index period. UQR was estimated at 10th, 20th, …, 90th quantiles. Predictors of adherence identified from the data included age, age squared, male gender, interaction of age and gender, indicator of mental health insurance coverage, region, commercial vs. Medicare insurance, log cost, comorbidity, and formulary tier for the AD medication.

Result: Baseline medication count was positively associated with adherence ($p<0.05$) in the upper half of the adherence distribution. Having mental health coverage is negatively associated with adherence in all but the 10th and 20th quantiles but the impact was substantially higher in the first half of the adherence distribution. Baseline (log) cost was positively associated with adherence in the 40th and upper quantiles of the adherence distribution. For patients in the 80th and 90th quantiles, the number of baseline office visits predicted lower adherence. Compared to patients from the East, patients from the South were less likely to be adherent in the 60th and 70th quantiles.

Conclusion: The study results underscore that the predictors can have heterogeneous impacts on different parts of the adherence distributions, that is, predictors of a highly adherent subject differ from a medium- or low-adherent subject. The complete picture of the impacts of the predictors on the entire medication adherence distribution will help the decision-maker to formulate actionable policy to improve adherence.

B-3. INVESTMENT AND DISINVESTMENT OF HEALTH TECHNOLOGIES: THE NEED FOR *TWO* COST-EFFECTIVENESS THRESHOLDS

2:00 PM - 2:15 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

Mike Paulden, MA., MSc., *University of Toronto, Toronto, ON, Canada*

Purpose: The concept of a cost-effectiveness "threshold" has been adopted either explicitly or implicitly by health care decision makers in numerous jurisdictions. This paper demonstrates that, under very weak

assumptions – applicable to all real-world health systems – decision makers ought to instead adopt *two* cost-effectiveness thresholds.

Method: A simple model of a hypothetical health care system is used to demonstrate the appropriate threshold(s) under various assumptions concerning: 1) the size of the health care budget; 2) the extent to which technology, productivity and/or input prices change over time; 3) whether the amount of information available to decision makers changes over time; and 4) the fixity of the set of adopted health care technologies in the short term.

Result: The assumptions which must hold for two thresholds to be appropriate are that: a) there is some fixity in the set of adopted health care technologies in the short term, and b) *either* 1) technology, productivity and/or input prices change over time, or 2) the information available to decision makers changes over time, or both. Where these assumptions hold, one threshold ought to be used when appraising technologies with positive incremental costs (investment decisions), while a different threshold should be used when appraising technologies with negative incremental costs (disinvestment decisions). This is true regardless of the marginality of the technologies under consideration.

Conclusion: This finding has profound implications for the practice of cost-effectiveness analysis, for ongoing and future empirical research into the nature of the threshold, and for health care policy making. It gives a theoretical underpinning to observations that the ICERs of technologies disinvested at the margin differ from those of technologies adopted at the margin. It also has implications for the interpretation of ICERs, for the appropriate calculation of net benefit, and for the conduct of value of information (VOI) analysis.

B-4. COMPARATIVE EFFECTIVENESS RESEARCH AND TECHNOLOGICAL ABANDONMENT

2:15 PM - 2:30 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

David H. Howard, PhD, *Emory University, Atlanta, GA and Yu-Chu Shen, PhD, Naval Postgraduate School, Monterey, CA*

**Comparative Effectiveness Research and Technological Abandonment**

Purpose: When a major study finds that a widely used medical treatment is no better than a less expensive alternative, do physicians stop using it? The COURAGE trial (NEJM 2007) found that percutaneous coronary intervention (PCI) is no better than an inexpensive regimen of medical therapy for patients with stable angina. We examine the impact of COURAGE on PCI use.

Methods: We developed a theoretical model of the impact of comparative effectiveness research on costs. The impact depends on: the difference in prices between comparison treatments, current practice patterns, and the impact of evidence on practice patterns. We hypothesize that physicians paid via fee-for-service will be less responsive to studies that recommend abandoning profitable treatments. We show that under these conditions, the expected value of a potential CER study on costs may be positive (i.e. cost-increasing) even if a finding for the less expensive treatment is more likely. The COURAGE trial affords an opportunity to examine how practice patterns change in response to "negative" results. We examine the impact of COURAGE on use of PCI from 2006 to 2009 using 100% patient discharge samples from hospitals in 5 large

states (AZ, CA, FL, MA, NJ), Veterans Administration (VA) hospitals, and English hospitals. US community cardiologists are paid via fee-for-service. VA and English cardiologists are salaried.

Results: The figure shows trends in PCI volume. PCI volume in patients with stable angina declined by 19% is US community hospitals and 14% in VA hospitals from 2006 to 2007. However, many patients with stable angina continue to receive PCI as primary therapy. There was no decline in PCI volume in England, possibly reflecting lower baseline use, pent-up demand, and expansions in PCI capacity over this period.

Conclusions: Comparative effectiveness research can reduce costs, but savings will not be fully realized if physicians are reluctant to abandon profitable treatments. We do not find support for the hypothesis that fee-for-service medicine blunted the impact of COURAGE in the US. Increasing use of medical therapy may require switching from a procedural-based system to a more integrated approach (e.g., accountable care

Quarterly PCI volume in patients with stable angina in US community, VA, and English hospitals relative to 2006 Q1 levels
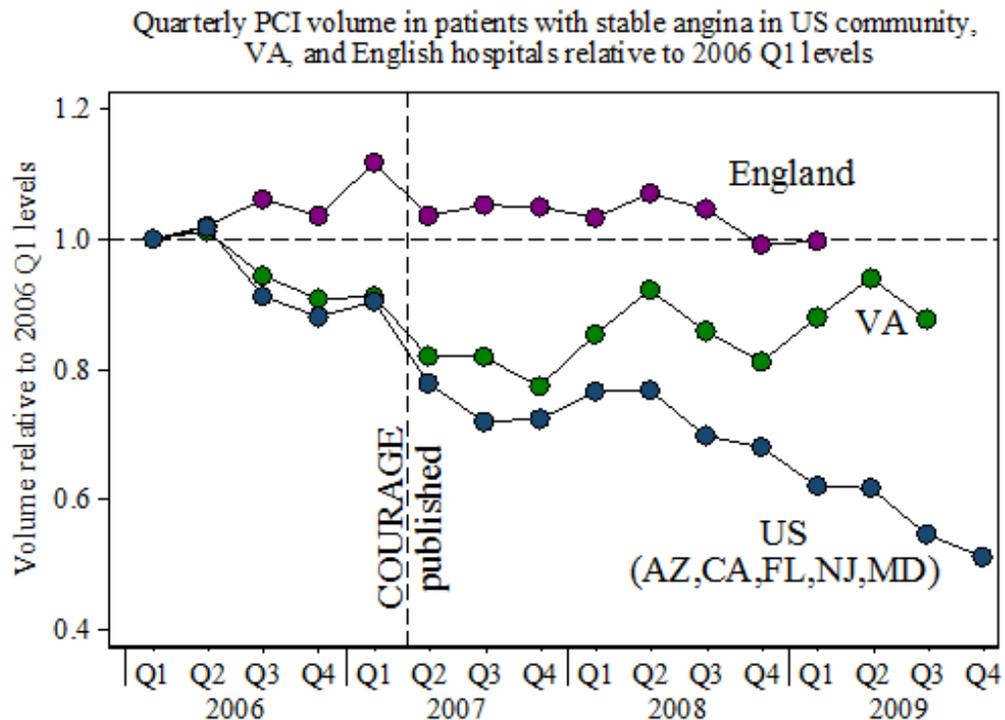
organizations).

B-5. A FRAMEWORK FOR MEASURING THE VALUE OF QUALITY IMPROVEMENT

2:30 PM - 2:45 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

***Michael S. Broder, MD, MSHS[1]**, Irina Yermilov, MD[2], Clifford Ko, MD[2], Melinda Maggard, MD, MSHS[2], Eunice Chang, PhD[1], Tanya G.K. Bentley, PhD[1], Dasha Cherepanov, PhD[1] and Emmett B. Keeler, PhD[3], (1)Partnership for Health Analytic Research, LLC, Beverly Hills, CA, (2)UCLA Center for Surgical Outcomes and Quality, Los Angeles, CA, (3)The RAND Corporation, Santa Monica, CA*

Purpose: Significant resources are allocated to quality improvement (QI), yet little is known about the costs and benefits of QI adherence. We developed a framework for measuring the value of QI activities and provide a worked example using the 2006 Healthcare Effectiveness Data and Information Set (HEDIS) measures.

Method: Our framework identifies the QI measures and setting(s) of interest and synthesizes QI cost-effectiveness data. For each measure, we: (1) quantify current compliance rates; (2) review literature and abstract CE data (incremental cost-effectiveness ratio, ICER); (3) estimate per-person steady-state cost and quality-adjusted-life-year (QALY) impacts; (4) calculate ICERs at current and full compliance levels based on calculated total costs and total QALYs; (5) perform sensitivity analyses to evaluate the impact of model assumptions on results. We applied this framework to 18 widely used US HEDIS measures. We defined full compliance as 95% and considered two types of costs: those of providing the clinical service (e.g., giving the vaccination to a patient in the case of a vaccination-related QI measure) and those of improving QI compliance (e.g., efforts to convince patients to be vaccinated). We assumed that only QI-improvement costs varied with compliance, with these costs in the base-case increasing linearly with compliance and in sensitivity analyses increasing exponentially, decreasing exponentially, and not changing with compliance.

Result: In the worked example, the literature search for cost-effectiveness data of 18 HEDIS measures yielded 1,901 articles; 1,629 were excluded and the remaining 272 articles were reviewed. After applying the framework, we estimated that increasing HEDIS compliance to 95% improved health but increased cost, with our framework-calculated ICERs for the individual HEDIS measures ranging from \$180/QALY (alcohol/drug dependence treatment) to \$39,805/QALY (breast cancer screening), with a median of \$9,791/QALY (glaucoma screening). Overall, optimizing HEDIS compliance to 95% with all 18 measures was estimated to cost \$12.3 billion and to save approximately 6 million QALYs, resulting in a mean ICER \$2,087/QALY.

Conclusion: We demonstrated the utility of our framework for quantifying value of QI programs like HEDIS, showing that improving compliance with such measures can be an efficient way to improve health. This framework can be a useful tool in quantifying and comparing the value of QI activities and health care interventions to aid decision-makers in resource allocation decisions.

B-6. HISTORICAL CONTROLS FOR MORTALITY: R.I.P

2:45 PM - 3:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH TECHNOLOGY AND OUTCOMES RESEARCH

Robert J. Bryg, MD and David J. Bryg, PhD, Olive View-UCLA Medical Center, Sylmar, CA

Purpose: Authors of observational studies frequently compare their results to previously published reports. Mortality is a commonly utilized hard endpoint, and the observational study frequently demonstrates improved survival compared to the selected historical control population. In this study, we sought to determine the variability in mortality rates in published clinical trials of cardiovascular interventions.

Method: After identifying large cardiovascular clinical trials which provided long term follow up and mortality rates, we calculated age and gender adjusted mortality hazard ratios in 621 clinical trial populations utilizing a competing risk model. We then identified median and 25th and 75th percentile of the mortality hazard ratios for 9 common cardiovascular disease states.

Result: On average, patients in clinical trials evaluating stable coronary artery disease (N=165 studies) had mortality that was similar to that of the population as a whole (HR = 0.95), but the inter quartile range (IQR) was 0.76-1.22. More profound differences in IQR were found for acute myocardial infarction (N =102) (HR = 2.98, IQR 1.78-4.08) and primary prevention studies (N = 66) (HR = 0.60, IQR 0.38-0.82). There was at least a 20% difference between the first quartile and the median value for the hazard ratio for all categories studied. In addition, between 1990 and 2010, there is a 65% reduction in mortality rates for both heart failure

(N = 110) and acute myocardial infarction. If a clinically significant difference in mortality is considered to be 20% or more, the observed variation in mortality hazard ratios here is so great that one can always find a control population to provide a favorable comparison. The further back in time one searches, the easier it is to find a "suitable" control population.

Conclusion: Variability in age and gender adjusted mortality hazard ratios, even for similar populations, is profound. Contemporaneously obtained controls are necessary to be valid comparators. Ultimately, the use of historical controls should find its place in history and rest in peace.

BD1. INVITED SESSION: ETHICS AND BEHAVIORAL ECONOMICS in MEDICINE

1:30 PM - 3:00 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Session Chairs:

- *Peter H. Schwartz, MD, PhD*
- *Scott D. Halpern, MD, PhD, MBE*

Session Summary:

1:30 PM – 1:53 PM

BD1-1. INTEGRATING ETHICS INTO THE SCIENCE OF BEHAVIOR CHANGE

1:53 PM - 2:15 PM

BD1-2. ETHICAL DEFENSE OF A NUDGE TOWARDS FECAL OCCULT BLOOD TESTING FOR COLORECTAL CANCER SCREENING

2:15 PM - 2:38 PM

BD1-3. COMPARATIVE ETHICS OF FINANCIAL INCENTIVES FOR HEALTH PROMOTION

2:38 PM – 3:00 PM

BD1-4. ETHICS AND BEHAVIORAL ECONOMICS IN MEDICINE DISCUSSION

Abstracts:

BD1-1. INTEGRATING ETHICS INTO THE SCIENCE OF BEHAVIOR CHANGE

1:30 PM - 1:45 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Part of Session: INVITED SESSION: ETHICS AND BEHAVIORAL ECONOMICS in MEDICINE

Jennifer Blumenthal-Barby, Ph.D., *Baylor College of Medicine, Houston, TX*

Purpose: To articulate and defend normative guidelines for the responsible deployment of behavioral economics and behavioral psychology principles to change health decisions and behaviors.

Method: Systematic review of the literature to identify studies recently done and policies recently developed that use principles from behavioral economics and behavioral psychology to change health decisions and behaviors, followed by conceptual analysis to develop and defend normative guidelines.

Result: Motivated in part by the NIH's designation of The Science of Behavior Change as a Roadmap Initiative, policy makers, researchers, and clinicians are turning increasingly to behavioral economics and behavioral psychology for tools to change individual and group health-related behaviors and decisions. Examples include exploiting the principle of loss aversion through incentives to get people to lose weight and engage in regular cancer screenings, exploiting the principle of the status quo to set defaults to increase HIV screening (CDC policy) and Sickle Cell Trait screening (NCAA policy), exploiting the principle of availability bias to paint vivid images in people's minds to discourage smoking (FDA policy) and full code status for certain patients, and exploiting the power of subconscious cues to prime people to pick healthy foods in restaurants and grocery stores. No corresponding guidelines have been developed to guide the use of these methods to ensure that they are used in an ethically responsible way.

Conclusion: The use of behavioral economics and behavioral psychology principles to change health decisions and behaviors fall into the following main categories: incentives, defaults, salience and affect, norms, and subconscious priming. Incentives must be guided by considerations of amount, kind, and whether they will damage the physician-patient relationship. Default settings and subconscious priming must be guided by considerations of whether it is fairly easy for people to opt-out or avoid and go their own way, and whether the default represents what is in most people's interests from an evidence-based point of view. The use of salience and affect, and also norms, must be guided by considerations of whether what is being presented is true and accurate, and whether there is a justification for appealing to emotion instead of rational argument.

BD1-2. ETHICAL DEFENSE OF A NUDGE TOWARDS FECAL OCCULT BLOOD TESTING FOR COLORECTAL CANCER SCREENING

1:45 PM - 2:00 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Part of Session: INVITED SESSION: ETHICS AND BEHAVIORAL ECONOMICS in MEDICINE

Peter H. Schwartz, MD, PhD, *Indiana University School of Medicine, Indianapolis, IN*

Purpose: Two of the approved screening tests for colorectal cancer (CRC) are colonoscopy performed every ten years and fecal occult blood testing (FOBT) done annually. While FOBT is easier to perform for many patients, it is also less sensitive and specific than colonoscopy for identifying polyps or CRC. As part of a research study that is currently underway, patients view a computer-based presentation about approved CRC screening tests. Half also view a "nudge" to encourage them to undergo stool testing if they are unsure about

which test to choose or are unwilling to have a colonoscopy. The justification for the nudge, consistent with behavioral economics, is to reduce procrastination due to indecision and increase the percentage of patients who get at least some screening. Pilot testing has suggested that the nudge may be effective at increasing interest in FOBT. Critics have raised the following ethical concern: The nudge may lead some patients who would have had screening colonoscopy to get FOBT instead, and some of them will be harmed if FOBT fails to identify a polyp or cancer that would have been detected by colonoscopy.

Method: Conceptual analysis of ethical issues raised by the use of a nudge towards FOBT, and consideration of relevant research on patient decision-making about CRC screening and in behavioral economics.

Result: The possibility that a nudge towards stool testing will harm some patients does not make the nudge unethical, according to widely accepted moral theories. From a Utilitarian perspective, the benefits can be expected to outweigh the harms if the nudge increases uptake of screening. From a Kantian perspective, some patients being harmed does not imply that the nudge is unethical, as long as it does not coerce or mislead individuals. At the same time, justifying the use of a nudge towards FOBT requires demonstrating improvement in outcomes or decision-making. In research studies of the impact of a nudge, the existence of possible harm should be disclosed to potential participants, even if the risk is minimal.

Conclusion: A nudge towards FOBT for CRC screening may be ethically acceptable even if it can be expected to harm some patients. More generally, it can be ethical to utilize nudges towards screening tests or preventive treatments that have lower effectiveness than other approaches.

BD1-3. COMPARATIVE ETHICS OF FINANCIAL INCENTIVES FOR HEALTH PROMOTION

2:00 PM - 2:15 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Part of Session: INVITED SESSION: ETHICS AND BEHAVIORAL ECONOMICS in MEDICINE

Scott D. Halpern, MD, PhD, MBE, *University of Pennsylvania School of Medicine, Philadelphia, PA*

Background: The insufficient success of conventional strategies to promote healthy behaviors suggests the need for novel approaches. Two broad motivations exist for such innovation. First, considerable reductions in productivity and increases in avoidable healthcare costs represent substantial externalities attributable to the unhealthy choices people make for themselves. At least as important are what have been called internalities – in this case, peoples' tendencies to make decisions that are easiest or most gratifying for in the present (e.g., to eat chocolate cake) despite the substantial costs these decisions carry for their future selves. The externalities of present choices provide a rationale for intervention based on social justice; the internalities of present choices provide a rationale for intervention based on beneficence.

Approach: This presentation will analyze the role of health incentives for promoting healthier behaviors – specifically, the use of money to reward (or penalize) individuals or groups for adopting (or failing to adopt) healthier behaviors. I will focus on the theme of comparative ethics – the idea that although all approaches to using or not using incentives for health promotion have ethical pros and cons, on balance some strategies have greater propriety than others.

Conclusions: The presentation will defend three key conclusions. First, incentive programs are not created equally, no more so in their ethics than in their effectiveness, and so judgments of propriety require both specificity and comparative thinking. Second, considering the concerns with incentive programs requires thinking broadly, comparing these concerns with those we might levy against either not intervening, or intervening in different, non-incentive-based ways. Third, a comparative ethics approach suggests the need

for empiricism – a view that the most compelling concerns we might levy against incentive programs rest on empirically testable, but as yet untested, assumptions about such programs' unintended consequences.

BD1-4. ETHICS AND BEHAVIORAL ECONOMICS IN MEDICINE DISCUSSION

2:15 PM - 2:30 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Part of Session: INVITED SESSION: ETHICS AND BEHAVIORAL ECONOMICS in MEDICINE

George Loewenstein, PhD, *Carnegie Mellon University, Pittsburgh, PA*

Discussion/response to the foregoing three presentations.

C. MODELING AND SIMULATION METHODS

1:30 PM - 3:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Session Chairs:

- *James Stahl, MD, CM, MPH*
- *Margaret L. Brandeau, PhD*

Session Summary:

1:30 PM - 1:45 PM

C-1. DEVELOPING A COMPLEX AGENT NETWORK MODEL TO PREDICT HIV AND HCV INCIDENCE IN CANADA

1:45 PM - 2:00 PM

C-2. GETTING THE BEST OF BOTH WORLDS: AN APPROACH FOR MAXIMISING INTERNAL AND EXTERNAL VALIDITY IN COST-EFECTIVENESS STUDIES

2:00 PM - 2:15 PM

C-3. ANALYTICAL SOLUTION METHODS FOR CONTINUOUS-TIME MARKOV AND SEMI-MARKOV MODELS

2:15 PM - 2:30 PM

C-4. TRANSFORMATION OF TRANSITION RATES AND PROBABILITIES IN DISCRETE-TIME MARKOV CHAINS: WHAT ABOUT COMPETING RISKS?

2:30 PM - 2:45 PM

C-5. HALF-CYCLE CORRECTION AND SIMPSON'S METHOD TESTED IN REAL HEALTH ECONOMIC MODELS – DOES IT MATTER WHICH METHOD WE USE?

2:45 PM - 3:00 PM

C-6. ACCOUNTING FOR UNCERTAINTY IN THE AFFECTED POPULATION USED IN VALUE OF INFORMATION ANALYSES: AN APPLICATION IN ADVANCED BILIARY TRACT CANCER

Abstracts:

C-1. DEVELOPING A COMPLEX AGENT NETWORK MODEL TO PREDICT HIV AND HCV INCIDENCE IN CANADA

1:30 PM - 1:45 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

***William W. L. Wong, Ph.D.**[1], Hla-Hla Thein, MD, MPH, PhD[2], Ahmed M. Bayoumi, MD, MSc[3] and Murray D. Krahn, MD, MSc[1], (1)University of Toronto, Toronto, ON, Canada, (2)Dalla Lana School of Public Health, Toronto, ON, Canada, (3)Centre for Research on Inner City Health, the Keenan Research Centre in the Li Ka Shing Knowledge Institute, Toronto, ON, Canada*

Purpose: Population contact networks, such as sexual and drug injection networks, play an important role in the dynamics of Human Immunodeficiency Virus (HIV) and hepatitis C virus (HCV) transmission. We built a complex network model that includes heterosexual, homosexual men, and drug injection networks to provide better understanding of the dynamics of HIV and HCV transmission. This network model facilitates the forecast of HIV and HCV epidemic growth, and thus enhances the accuracy of future cost-effectiveness analyses for HIV and HCV.

Method: By combining multi-agent systems and complex networks, we developed a complex agent network model that accommodates differential selectivity, behavior, and network properties to explain the HIV and HCV epidemic. In our model, agents represent individuals who can have interactions with other individuals. We simulated the entire Canadian population, stratified by age groups, sex, sexual orientation, and immigrant status. Each individual has his/her own injection and sexual behavior. Drug injection behavior was characterized by the injection frequency, and the rate of sharing injecting equipment. Sexual behavior was characterized by sexual activity rate, condom usage rate, the number of sexual partners, and the type of partnership (casual or regular). Heterosexual networks, homosexual men networks, and injection networks were created to describe the contact patterns between individual. We estimated parameters from literature-derived estimates of Canadian demographic, epidemiological, sexual and injection behavior data. Historical Canadian HIV and HCV data were used for validation.

Result: The simulated number of new HIV and HCV infections were compared with the historical reported cases in Canada. Our initial results showed a similar trend to the reported cases in Canada. In the next 10 years, our model projected that a total of 41,900 individuals would be newly infected with HIV, of whom 30.8% were infected through the heterosexual contact, 59.2% through homosexual contact, and 10.0% through sharing of injection drug paraphernalia. The model also projected that 85,300 individuals would be newly infected with HCV through the drug injection network in the next 10 years.

Conclusion: Our network model showed good calibration between historical Canadian HIV and HCV data and the simulation results. This complex network model reflects dynamics of HIV and HCV transmission, which enables forecasting of the epidemiology of HIV and HCV for policy-level decision making in Canada.

C-2. GETTING THE BEST OF BOTH WORLDS: AN APPROACH FOR MAXIMISING INTERNAL AND EXTERNAL VALIDITY IN COST-EFECTIVENESS STUDIES

1:45 PM - 2:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

Jasjeet S. Sekhon, PhD, UC-Berkeley, Berkeley, CA, Erin Hartman, MA, University of California, Berkeley, CA and Richard Grieve, PhD, London School of Hygiene and Tropical Medicine, London, United Kingdom

Purpose: Cost-effectiveness analyses (CEA) may use RCTs to maximise internal validity. However, when RCTs include patients and centres atypical of those in routine clinical practice, CEA results may be subject to sample selection bias. To reduce this bias, observational data can be used to reweight the trial-based estimates. We present an approach to assess the assumptions behind any reweighting strategy, illustrated with a case study of high policy-relevance.

Method: We decompose sample selection bias into observable or unobservable differences between the RCT and the setting of interest. We consider alternative ways of reweighting the RCT estimates, to the population's characteristics. The first estimation strategy, reweights according to Inverse Probability of Treatment Weighting (IPW), where 'treatment' is inclusion in the RCT. The second strategy uses maximum entropy (MaxEnt) weighting along with matching. Either approach makes the identifying assumption that selection into the RCT is conditional on observable characteristics. We consider this critical underlying assumption with novel placebo tests. These test the non-equivalence of reweighted outcomes following treatment in the RCT, versus outcomes after treatment in the population. Passing these tests implies that the identifying assumption holds, and there is sufficient power to detect outcome differences across settings. We consider this approach in a UK CEA of Pulmonary Artery Catherization (PAC) using an RCT (n=1,014), and observational data on PAC use in routine practice (n=1,000). Across both settings, 40 baseline covariates were identically recorded. Differences across settings were reported, for example in the proportion admitted to non-teaching hospitals (RCT: 80%; population: 60%). We used IPW and MaxEnt to reweight the RCT estimates. We report cost-effectiveness overall, and for subgroups defined *a priori.*

Result: The overall incremental net benefit (INB) of PAC from the RCT was -£7,900 (95% CI from -£18,500 to £2,600), the corresponding estimates reweighted for the general population were, -£10,000 (-18,500 to -£2000) [IPW] and £1,500 (-£6,700 to £9,900) [MaxEnt]. For non-teaching hospitals, the INBs were £900 (-£12,100 to £14,000) [RCT], £200 (-£9,900 to £10,300) [IPW] and £18,800 (£8,400 to £29,200) [MaxEnt]. IPW failed placebo tests both overall and for the non-teaching hospital subgroup, whereas MaxEnt passed the corresponding tests.

Conclusion: This approach can help maximise the external validity of RCT-based CEA. The placebo tests presented are useful for choosing amongst competing weighting strategies.

C-3. ANALYTICAL SOLUTION METHODS FOR CONTINUOUS-TIME MARKOV AND SEMI-MARKOV MODELS

2:00 PM - 2:15 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

Joost van Rosmalen, PhD, *Erasmus MC, University Medical Center, Rotterdam, Netherlands*

Purpose: To show how continuous-time Markov and semi-Markov models can be analyzed without simulation, based on matrix algebra and stochastic process methods.

Method: Markov and semi-Markov decision models are widely used for cost-effectiveness analysis in health-economic evaluation. These models are often evaluated in discrete time using cohort analysis or in continuous time using microsimulation. However, both approaches have limitations. Cohort analysis is based on the assumption that at most 1 event can occur per cycle and requires ad-hoc methods to avoid biased cost-effectiveness estimates. Microsimulation introduces simulation error and can be computationally intensive, especially when used for model calibration and probabilistic sensitivity analysis. We use matrix algebra and stochastic process methods to derive analytical solutions for continuous-time Markov models. We also show how semi-Markov models can be approximated by Markov models, so that semi-Markov models can also be analyzed without microsimulation.

Result: Using Kolmogorov's differential equations, we find analytical solutions for the expected distribution of patients over the health states in Markov chain models, and the expected time spent in each state. These mathematical results enable us to analytically calculate the expected costs and health effects of continuous-time Markov chain models. This method can be interpreted as a continuous-time version of the fundamental matrix solution. This method can also be used to account for age-specific transition rates and discounting, which was not possible using the original fundamental matrix solution. Finally, we show how the concept of tunnel states can be generalized so that semi-Markov models (i.e., with any type of sojourn time distribution) can be approximated by Markov models with any degree of accuracy. Computational tests confirm that this approach is feasible; it is possible to compute the costs and health effects in continuous-time Markov models with hundreds of states within a few seconds.

Conclusion: Continuous-time Markov and semi-Markov models are a versatile tool for estimating the health and economic effects of medical interventions. Currently, these models are almost always evaluated using microsimulation. However, analytical solution methods exist and can easily be implemented. Analytical solutions can simplify the optimization methods used for model calibration and can reduce the computation time needed for probabilistic sensitivity analyses.

C-4. TRANSFORMATION OF TRANSITION RATES AND PROBABILITIES IN DISCRETE-TIME MARKOV CHAINS: WHAT ABOUT COMPETING RISKS?

2:15 PM - 2:30 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

Jagpreet Chhatwal, PhD, *University of Pittsburgh, Graduate School of Public Health, Pittsburgh, PA and Elamin H. Elbasha, Merck Research Laboratories, North Wales, PA*

Purpose: The widely used formula $\hat{a}_i = 1-(1-p_i)^{s/t}$ for converting a probability p_i over time interval t into a transition probability $\hat{a}_i$ for a Markov model with cycle length s ignores competing risks. We demonstrate anomalies with this approach and derive formulas that take into account the dynamics of competing risks and compute the bias resulting from using the traditional approach in a liver disease Markov model.

Methods: The three-state model with competing risks consists of patients starting at decompensated-cirrhosis (DeCirr), and moving tote of 0.03) cost and quality-adjusted life years (QALYs) using the corrected formula and the traditional approach.

Results: The formulas for converting t-interval probabilities into cycle-length s transition probabilities are shown in Figure 1b. The "uncorrected" approach gave $\hat{a}_1=0.0013$, $\hat{a}_2=0.0029$, and $\hat{a}_3=0.0106$, whereas the "corrected" approach yielded $\tilde{a}_1=0.0019$, $\tilde{a}_2=0.0025$, and $\tilde{a}_3=0.0106$. The n-step ($n=52.18$) transition probability matrix (TPM) of weekly cycle-length did not yield back the original annual TPM with the "uncorrected" approach. The estimated total cost using the "uncorrected" and "corrected" approach were $45,870 and $53,594, respectively (bias= − 17%), and QALYs were 2.69 and 2.68, respectively (bias=1%) (Table 1).

Conclusions: The traditional approach of converting interval probabilities into different cycle lengths ignores competing rdel structures.

Figure 1a. Markov model of advanced liver disease

DeCirr
Annual cost = $5,363
Utility weight = 0.61

$p_1 = 0.068$

HCC
Annual cost = $50,896
Utility weight = 0.55

$p_2 = 0.140$

$p_3 = 0.427$

Death
Annual cost = $0
Utility weight = 0

Figure 1b. Formula considering competing risk

$$\tilde{a}_1 = \frac{p_1[(1-p_3)^{s/t}-(1-p_1-p_2)^{s/t}]}{p_1+p_2-p_3},$$

$$\tilde{a}_2 = \frac{p_1[1-(1-p_3)^{s/t}]+(p_2-p_3)[1-(1-p_1-p_2)^{s/t}]}{p_1+p_2-p_3},$$

$$\tilde{a}_3 = 1-(1-p_3)^{s/t}$$
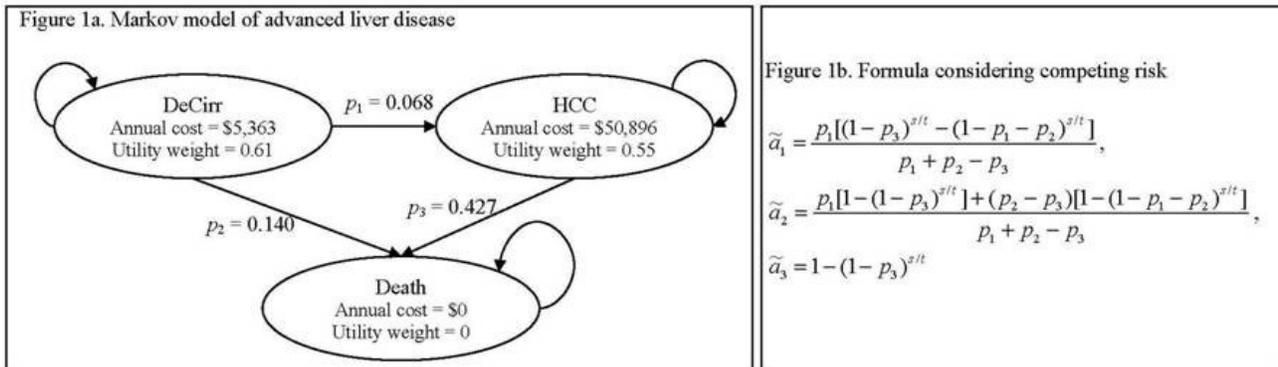
Table 1: Cumulative incidence of HCC, liver-related death, discounted costs, discounted QALYs and bias using the traditional approach.

	Year	5	10	15	20	Lifetime
HCC	Uncorrected	2,128	2,836	3,069	3,147	3,185
	Corrected	2,946	3,869	4,157	4,246	4,287
	Bias	-817	-1,033	-1,087	-1,100	-1,102
	(%)	(-38.4%)	(-36.4%)	(-35.4%)	(-35.0%)	(-34.6%)
Deaths	Uncorrected	6,113	8,681	9,562	9,855	10,000
	Corrected	6,094	8,735	9,603	9,876	10,000
	Bias	20	-54	-41	-21	0
	(%)	(0.3%)	(-0.6%)	(-0.4%)	(-0.2%)	(0%)
Costs	Uncorrected	$28,474	$40,685	$44,380	$45,445	$45,870
	Corrected	$33,298	$47,829	$52,028	$53,172	$53,594
	Bias	-$4,824	-$7,144	-$7,648	-$7,728	-$7,724
	(%)	(-16.9%)	(-17.6%)	(-17.2%)	(-17.0%)	(-16.8%)
QALYs	Uncorrected	1.88	2.46	2.63	2.68	2.69
	Corrected	1.89	2.46	2.62	2.66	2.68
	Bias	-0.02	-0.01	0.01	0.01	0.01
	(%)	(-0.9%)	(-0.2%)	(0.2%)	(0.4%)	(0.5%)

C-5. HALF-CYCLE CORRECTION AND SIMPSON'S METHOD TESTED IN REAL HEALTH ECONOMIC MODELS – DOES IT MATTER WHICH METHOD WE USE?

2:30 PM - 2:45 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

Torbjørn Wisløff, M.Sc.[1], *Gunhild Hagen, MPhil*[1] *and Kim Rand-Hendriksen, Cand.Psychol*[2], *(1)Norwegian Knowledge Centre for the Health Services, Oslo, Norway, (2)Akershus University Hospital, Lørenskog, Norway*

Purpose: To test the practical impact of replacing half-cycle correction with Simpson's method in Markov models of cost-effectiveness.

Method: Markov models are frequently used in cost-effectiveness modeling, particularly when modeling chronic diseases. In Markov models, time is handled as a series of discrete cycles, where events of interest are counted either at the beginning or end of each cycle. In real life, these events can occur at any time within each cycle, hence, this is best represented as a continuous probability function. This means we are actually interested in the integral of a continuous function even though events are counted either at the start or end of the cycles. Uncorrected, Markov models systematically overestimate (events at cycle start) or underestimate (events at cycle end) event frequency. The most common adjustment in health economic modeling is half-cycle correction; shifting cycle estimates by half a period. While this method reduces model bias, it has been criticized both at the SMDM meeting in 2009, and in an MDM paper for being a poor approximation to the integration problem. Opponents to half-cycle correction suggest using Simpson's method, an old mathematical approximation to estimating the integral of a continuous line represented by discrete points. We have used three recently developed health economic models to test whether replacing half-cycle correction with Simpson's method makes a practical difference. All models are Markov models with several events and health states modeling cost-utility in a lifetime perspective. We ran the three models for a number of different scenarios and interventions.

Result: Results varied from -17.2% to 0.19% in terms of incremental costs for Simpson's method compared to half-cycle correction. In terms of differences in quality-adjusted life-years, results varied between -0.75% and 0.67%.   Differences in net health benefit varied between -0.06% and 0.21%, while differences in incremental net health benefit varied between -1.56% and 12.7%. INHB did not change from positive to negative or vice versa in any comparisons.

Conclusion: In our analyses, cost differences varied substantially between half-cycle correction and Simpson's method. In terms of quality-adjusted life-years, differences were small in our models. Conclusions did not change in any of our analyses, however changes in incremental net health benefit was not negligible, suggesting that conclusions could be altered under specific circumstances.

C-6. ACCOUNTING FOR UNCERTAINTY IN THE AFFECTED POPULATION USED IN VALUE OF INFORMATION ANALYSES: AN APPLICATION IN ADVANCED BILIARY TRACT CANCER

2:45 PM - 3:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: MODELING AND SIMULATION METHODS

Joshua A. Roth, MHA *and Josh J. Carlson, PhD, University of Washington, Seattle, WA*

Purpose: To demonstrate the impact and utility of accounting for technology diffusion and uncertainty in calculating the affected population for value of information analysis through a case study in advanced biliary tract cancer.

Method: We modified a previously published decision-analytic model to estimate the expected value of perfect information (EVPI) for two treatment strategies in advanced biliary tract cancer: 1) gemcitabine and cisplatin 2) standard care, with all patients receiving gemcitabine alone. The model utilized standard methods to calculate the per-patient EVPI, but incorporated a stochastic method for calculating the population EVPI, representing the uncertainty in the estimated technology lifetime, disease incidence, and technology diffusion rate. Model parameters and uncertainty ranges were derived from the ABC-02 Trial, published literature, and government sources. We used SEER incidence estimates, a 5 to 15% annual diffusion rate, a 5 to 15-year range for technology use, and a willingness-to-pay threshold of $150,000/QALY. We compared three population EVPI estimates, 1) instant technology diffusion (base-case), 2) gradual deterministic diffusion, and 3) gradual diffusion with uncertainty in affected population parameters.

Result: The gemcitabine+cisplatin strategy produced greater net-benefit than standard care in 89% of simulations and the average consequence of selecting the wrong strategy was $7,900. In the base case, the population EVPI for an affected population of 67,000 over a 10-year horizon was $58.2 M. Incorporating a gradual deterministic rate of diffusion changed the estimate to $29.6 M. Finally, incorporating uncertainty provided a credible interval to the population EVPI ($29.6 M; CI: $11.1 to $48.8 M).

Conclusion: This case study demonstrates the potential impact and utility of incorporating a stochastic method for calculating the affected population in value of research analyses relative to the current deterministic standard and its assumptions regarding technology diffusion. This approach builds on standard methods by representing real world uncertainty about the technology lifetime, incidence estimates, and rate of technology diffusion. This approach may be particularly useful when different study designs may lead to different rates of technology diffusion or when there is substantial variation in annual incidence estimates over the lifetime of the technology (e.g. when changing screening/diagnostic practices may lead to variable disease incidence). These methods can also be applied to other value of information analyses (e.g. value of sample information), and can increase the informational yield of such estimations.

BD2. INVITED SESSION: ISPOR-SMDM MODELING GOOD RESEARCH PRACTICES TASK FORCE UPDATE

4:30 PM - 6:00 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)

Abstracts:

BD2-1. TASK FORCE UPDATE

4:30 PM - 4:45 PM: Mon. Oct 24, 2011
Columbus Hall AB (Hyatt Regency Chicago)
Part of Session: INVITED SESSION: ISPOR-SMDM MODELING GOOD RESEARCH PRACTICES TASK FORCE UPDATE

J. Jaime Caro, MDCM, FRCPC, FACP, *United BioSource Corporation, Lexington, MA*

This ISPOR-SMDM Joint Modeling Good Research Practices Task Force will provide a guidance for: a) delineating the approach and design of modeling studies and the identification and preparation of required data, b) selecting a modeling technique, c) implementing and validating the model, d) addressing uncertainty around model results, e) reporting the modeling study results to assure transparency, and f) using model-based study results to inform decision-making. Since there are multiple issues to be addressed by this Modeling Task Force, and to assure each issue is adequately addressed including defining preferred practices for different modeling techniques.

The goal is to ensure that good research practices on modeling techniques remain useful for all current modeling techniques as well as to foster the use of model-based results to inform health care decisions, a Modeling Good Research Practices Task Force was created to address (1) advances in modeling, (2) approaches to evaluating variability in models, and (3) transparency in reporting of models.

D. SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

4:30 PM - 6:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Sarah T. Hawley, PhD, MPH*
- *David Katz, MD, MSc*

Session Summary:

4:30 PM - 4:45 PM

D-1. TOWARD MINIMUM STANDARDS FOR THE CERTIFICATION OF PATIENT DECISION AIDS: A CORRELATION ANALYSIS AND MODIFIED DELPHI CONSENSUS PROCESS

4:45 PM - 5:00 PM

D-2. WHO IS GUIDING DECISIONS ABOUT WHETHER TO PERFORM PEDIATRIC GASTRIC FUNDOPLICATION?

5:00 PM - 5:15 PM

D-3. BELIEFS ABOUT COMMUNICATING WITH A PHYSICIAN ABOUT MEDICAL DECISIONS: DISTINGUISHING BETWEEN EXCHANGING INFORMATION AND MAKING A CHOICE

5:15 PM - 5:30 PM

D-4. IMPLEMENTING SHARED DECISION MAKING IN A MULTICULTURAL PRACTICE: A COLLABORATIVE PRIMARY CARE-HEALTH EDUCATOR APPROACH

5:30 PM - 5:45 PM

D-5. FACILITATORS AND BARRIERS TO IMPLEMENTING SHARED DECISION MAKING IN A PRIMARY CARE DEMONSTRATION

5:45 PM - 6:00 PM

D-6. EVALUATING ASSOCIATIONS BETWEEN PATIENT PREFERENCES FOR COLORECTAL CANCER SCREENING TESTS AND THE CONTENT OF PATIENT-PHYSICIAN DISCUSSIONS

Abstracts:

D-1. TOWARD MINIMUM STANDARDS FOR THE CERTIFICATION OF PATIENT DECISION AIDS: A CORRELATION ANALYSIS AND MODIFIED DELPHI CONSENSUS PROCESS

4:30 PM - 4:45 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

*Natalie Joseph-Williams[1], Robert Newcombe[1], Mary Politi, Ph.D.[2], Marie Anne Durand[1], Stephanie Sivell, BA, MPhil[1], Dawn Stacey, PhD[3], Annette M. O'Connor, PhD[4], Robert J. Volk, PhD[5], Adrian Edwards, MB, PhD[1], Carol Bennett, MSc[6], Michael Pignone, MD, MPH[7], Richard Thomson, MD[8] and **Glyn Elwyn, BA, MB, BCh, MSc, PhD, FRCGP**[1], (1)Cardiff University, Cardiff, United Kingdom, (2)Washington University in St. Louis, St. Louis, MO, (3)Ottawa Health Research Institute, Ottawa, ON, Canada, (4)University of Ottawa, Ottawa, ON, Canada, (5)The University of Texas MD Anderson Cancer Center, Houston, TX, (6)Ottawa Hospital Research Institute, Ottawa, ON, Canada, (7)University of North Carolina at Chapel Hill, Chapel Hill, NC, (8)University of Newcastle upon Tyne, Newcastle upon Tyne, United Kingdom*

Purpose: IPDAS developed an instrument (IPDASi) to assess the quality of patient decision aids (PDAs). There have been calls in the US for these tools to be certified. The aims were to: (1) correlate IPDASi scores with outcome measurements in RCTs (included in Cochrane systematic review of PDAs); (2) conduct a Delphi consensus process for expert agreement on minimum standards for PDAs, based on IPDASi items.

Method: Aim 1: The PDAs were included if the RCT measured at least one of the following outcomes: knowledge, accurate risk perceptions, preference congruence with choice (attributes of decision), participation in decision-making or satisfaction with decision-making process (attributes of decision process). IPDASi quality scores were produced (two independent raters per PDA). Correlation analyses were conducted between adjusted mean global IPDASi scores and effect sizes. Aim 2: Two-stage Delphi voting process considered the inclusion of IPDASi items as minimum standards. Item mean scores and qualitative comments were analysed, followed by expert multidisciplinary group discussion.

Result: Aim 1: 31 PDAs were included in the sample, 26 were accessible for evaluation. A significant correlation was found between quality scores and accurate patient risk perceptions (rho = 0.8, p = 0.02). No other correlations were significant, but the positive direction of all but one outcome correlation provides support for the view that PDA quality scores, as judged by IPDASi, is associated with better outcomes in RCTs. Aim 2: 101 people voted in round 1; 87/101 (88%) voted in round 2. The 47 items in IPDASi v3.0 were reduced to 45 items (3 items combined) and were placed in three categories, namely: qualifying criteria (6 items); certification criteria (11 items) and quality criteria (28 items). The following operationalisation was adopted: 1) qualifying criteria would be assessed on a binary (yes or no) scale; to qualify, i.e. be considered for certification, tools should meet all these 6 criteria; 2) certification criteria would be scored on a 4-point Likert (agreement) scale and tools should score positively to meet a certification threshold (minimum standards); 3) quality criteria would be scored on a 4 point Likert (agreement) scale.

Conclusion: To ensure 'fitness for use' and for the protection of patients, this study provides minimum standards criteria for PDAs, standards that need to be tested and ratified.

D-2. WHO IS GUIDING DECISIONS ABOUT WHETHER TO PERFORM PEDIATRIC GASTRIC FUNDOPLICATION?

4:45 PM - 5:00 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

***David Fox, MD**[1]*, *E. Campagna, MS[2], J. Barnard, MA[2], J. Bruny[3], D. Partrick[3] and A. Kempe, MD, MPH[4], (1)University of Colorado, Denver, Aurora, CO, (2)Children's Outcomes Research Program, Denver, CO, (3)Children's Hospital, Denver, Denver, CO, (4)Children's Outcome Research Program, Denver, CO*

Purpose: The decision about whether to perform or not perform a gastric fundoplication has enormous clinical and cost implications. Children who are having a gastrostomy procedure are often considered candidates for fundoplication, yet there is no clinical consensus as to who needs a fundoplication. Our purpose was to examine subjective and objective factors influencing the decision of pediatric surgeons to perform or not perform a gastric fundoplication in children undergoing a gastrostomy procedure.

Method: A pre-operative self-administered 34 item questionnaire on objective and subjective decisional influences was completed by the attending pediatric surgeon on two groups of patients: those having a gastrostomy with a fundoplication, and those having a gastrostomy without a fundoplication. All six surgeons who perform fundoplication at a major children's hospital participated.

Result: From July 1, 2009 through June 30, 2010, 169 patients met eligibility criteria and 161 surveys (95%) were completed. The mean age of the patients was 2.9 years (median=0.8 years), 59% were male, 57% had Medicaid, and 62% were neurologically impaired. Of the cohort, 66% were referred as an inpatient, and >50% had at least two pediatric subspecialists involved in their care. For 86% of cases the surgeons reported that the input of another physician had somewhat or a lot of influence on their decision about fundoplication. Specifically, they mentioned the input of several pediatric specialists: Neonatologists (24%), Hospitalists (25%), Pulmonologists (18%), Primary Care Physicians (16%), and Gastroenterologists (9%). The opinion of parents contributed somewhat or a lot to the decision 72% of the time. Among the 89% of the cohort that had an upper GI contrast study, surgeons stated that the results had a lot of influence 45% of the time. Multivariable logistic regression showed the following factors were associated with the patient receiving a fundoplication, involvement of a pulmonologist (OR 1.7, 95% CI: 1.1-2.6), neonatologist (OR 1.9, 95% CI: 1.3-2.9) and PCP (OR 0.6, 95% CI: 0.4-0.9).

Conclusion: Most decisions to perform a fundoplication occur in the inpatient setting and are impacted by a variety of objective and subjective factors, most notably the opinions of other physicians. The high level of input that pediatric subspecialists have on the decision and the patterns of referral to the surgeons have important implications for the development and implementation of a shared decision making tool.

D-3. BELIEFS ABOUT COMMUNICATING WITH A PHYSICIAN ABOUT MEDICAL DECISIONS: DISTINGUISHING BETWEEN EXCHANGING INFORMATION AND MAKING A CHOICE

5:00 PM - 5:15 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

Dominick Frosch, PhD[1], *Caroline Tietbohl, BA*[1]*, France Legare, MD, PhD, CCFP, F*[2] *and Glyn Elwyn, MD, PhD*[3]*, (1)Palo Alto Medical Foundation Research Institute, Palo Alto, CA, (2)Laval University, Quebec, QC, Canada, (3)Cardiff University, Cardiff, United Kingdom*

Purpose: Considerable scholarship has focused on physician communication skills for shared decision making, but little is known about why patients are sometimes reluctant to engage in a collaborative dialogue with physicians.

Method: An online panel of respondents (N=1,340; Mean age = 56.5, SD=9.9) read a vignette describing a treatment decision making scenario focused on moderate coronary artery disease. The vignette emphasized that three treatment options exist with equivalent long-term mortality outcomes. Respondents answered theory-based questions, building on Fishbein's Integrative Model, focused on three key communication behaviors that facilitate shared decision making: (1) asking questions, (2) discussing preferences and (3) disagreeing with a recommendation. The first two are necessary for exchanging information. We asked about "disagreeing with a recommendation" as a potentially necessary assertive behavior if a physician's recommendation is incongruent with patient preferences. Questions focused on respondents' intention to engage in these behaviors in response to the scenario, their beliefs about the likely outcomes of doing so, and who would approve or disapprove of these actions. Data were analyzed with analysis of variance.

Result: Respondents had significantly lower intentions to disagree with a recommendation not congruent with their preferences (M=3.1, SD=1.5) than to ask questions (M=6.5, SD=.95) or discuss preferences (M=6.5, SD=.92; $p<.0001$). Intentions to disagree were highest among those indicating a preference for autonomous decision making ($p<.0001$). Intentions to ask questions ($p<.003$) and discuss preferences ($p<.0001$) were highest among those indicating a preference for shared decision making. Disagreeing was perceived as more likely to result in the physician viewing the patient as "difficult" ($p<.0001$), harming the therapeutic relationship ($p<.0001$), and lowering the likelihood of getting the "treatment that results in outcomes I prefer" ($p<.0001$). Respondents indicated that medical staff would be less likely to approve of asking questions ($p<.0001$), discussing preferences ($p<.0001$) or disagreeing with a physician ($p<.0001$) than spouses, family members or friends.

Conclusion: Results from this survey indicate that patients have little difficulty envisioning exchanging information with their physicians, but are much less likely to envision disagreeing with a preference incongruent recommendation. Paradoxically, respondents felt that disagreeing would lower the likelihood of getting their preferred treatment. Combined with the perception that medical staff are less supportive of active patient communication, these results provide evidence of considerable medical-cultural barriers to shared decision making.

D-4. IMPLEMENTING SHARED DECISION MAKING IN A MULTICULTURAL PRACTICE: A COLLABORATIVE PRIMARY CARE-HEALTH EDUCATOR APPROACH

5:15 PM - 5:30 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

Ruby Spicer[1], *Mary Bitterauf*[1], *Caryn Radziucz*[2], *Catherine Fredricks*[2], *Jennifer Aronson*[2], *Neil Korsen*[1] *and Kathleen Fairfield*[2], *(1)MaineHealth, Portland, ME, (2)Maine Medical Center, Portland, ME*

Purpose: It is widely recognized that use of decision aids (DAs) and decision support in clinical practice results in greater knowledge, participation in decision making, and decision comfort for patients. To increase patient engagement and effective self-care at MMC Medical Clinic, which serves a vulnerable multicultural, multilingual population (49% Medicaid, 9% Medicare, 16% dual eligible, 16% free care; >30% refugee/ESL), we implemented a collaborative shared decision making (SDM) program.

Method: Primary care providers partnered with an onsite Learning Resource Center (LRC) health educator to order DVD-based decision aids (DAs) in an effort to: (1) inform patients regarding screening, treatment, and self-care options for selected conditions; and (2) create a structured SDM process to elicit patient values and preferences regarding these options. Following referral of patients to the LRC, the SDM-trained health educator provided one-on-one encounters for DA viewing and decision support regarding diabetes, prostate and colorectal cancer screening, back pain, and depression. The SDM process included identification of eligible patients; creation of an electronic DA order enabling the health educator to contact consenting patients; an approximately one-hour DA viewing consult with the educator and sometimes an interpreter; completion of DA pretests and posttests; and documentation of the LRC encounter. Pretest and posttest data were gathered beginning in July 2010, and were used to identify key follow-up issues and assess patient satisfaction with the SDM process.

Result:

	MMC Clinic (n=45 patients)	All SDM pilot practices (n=154 patients)
Less than HS education	27%	12%
Watched all of DA DVD	87%	62%
DA perceived as "very/extremely useful" for clarifying values	73%	54%
Change in certainty about health care decisions: before and after SDM	18% → 59%	26% → 47%
"Very/extremely important" for providers to give DAs to patients	87%	64%

Conclusion: Our experience shows that primary care providers, health educators, and interpreters can work together to engage "hard to reach" multicultural, multilingual populations in shared decision making.

Despite challenges to integrating SDM into routine clinical practice including systematic identification of patients to use DAs, efficient tracking and sharing of SDM process data, and limited provider time for quality improvement activities, we recommend that providers who care for multicultural populations adopt innovative SDM strategies to ensure that patients' values and preferences are central to health care decision making.

D-5. FACILITATORS AND BARRIERS TO IMPLEMENTING SHARED DECISION MAKING IN A PRIMARY CARE DEMONSTRATION

5:30 PM - 5:45 PM: Mon. Oct 24, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SHARED DECISION MAKING AND PATIENT-PHYSICIAN COMMUNICATION

Mark W. Friedberg, MD, MPP[1], Kristin Van Busum, MPH[1], Richard Wexler, MD[2] and Eric C. Schneider, MD, MSc[1], (1)RAND Corporation, Boston, MA, (2)The Foundation for Informed Medical Decision Making, Boston, MA

Purpose: To identify facilitators and barriers to implementing shared decision making (SDM) in primary care.

Method: We conducted 23 semi-structured interviews with leaders and clinicians from nine primary care practice sites participating in a current SDM implementation demonstration. Using a guide developed with input from demonstration conveners, interviewers queried respondents about their sites' processes for integrating decision aids (DAs) into ongoing clinical operations, focusing on facilitators and barriers to operational tasks such as engaging clinicians, distributing DAs, and tracking patients through subsequent steps of SDM. Researchers inductively analyzed interview responses for recurrent themes.

Result: *Facilitators.* All respondents reported that SDM was consistent with their sites' professional cultures, and most identified "champions" who engaged other clinicians in DA use. To facilitate DA distribution, some sites developed protocols that empowered non-physician staff: "The most successful sites…developed workflows that take the physician out of making the decision [about DA distribution]." To identify DA-eligible patients, these sites leveraged existing data (e.g., patient demographic characteristics, for screening decisions) and clinical processes (e.g., specialist referrals, for surgical decisions). When identifying DA-eligible patients required case-by-case physician judgment, single-click DA order entry and DA viewing by physicians facilitated greater distribution. *Barriers.* Physicians' lack of prior SDM training was a barrier to participation: "Physicians felt that they were already doing shared decision making [before introducing DAs]." Physician DA ordering, though sometimes necessary for patient identification, limited distribution in multiple sites: "As long as you have the physicians in the middle of [DA ordering] they have too many other things on their plate to reliably ensure this would happen every time…in a 10-15 minute appointment." Medical record systems (paper or electronic) posed significant barriers to tracking patients through the SDM process. For example, nearly all sites' records lacked indicators for which patients had received DAs, mechanisms for communicating patient-reported values and preferences, and registry functions to follow patients' progress towards their decisions (e.g., to determine whether patients had timely post-DA decision making conversations with providers).

Conclusion: Even among highly motivated demonstration sites, there are significant educational, operational, and informatics challenges to implementing SDM in primary care. Empowering non-physicians may enhance distribution reliability for some DAs. However, improving post-DA follow-through may require better mechanisms for tracking patients and facilitating information exchange between patients and clinicians.

D-6. EVALUATING ASSOCIATIONS BETWEEN PATIENT PREFERENCES FOR COLORECTAL CANCER SCREENING TESTS AND THE CONTENT OF PATIENT-PHYSICIAN DISCUSSIONS

Sarah E. Lillie, MPH[1], Sarah T. Hawley, PhD, MPH[2], Nancy Oja-Tebbe, BS[3], Tracy Wunderlich, MA[3] and Jennifer Elston Lafata, PhD[4], (1)University of Michigan, Ann Arbor, MI, (2)University of Michigan, Ann Arbor VA Health System, Ann Arbor, MI, (3)Henry Ford Health System, Detroit, MI, (4)Virginia Commonwealth University, Richmond, VA

Purpose: 1) to explore variations in patient-physician conversations about colorectal cancer screening modality preferences and screening modality recommendation by their physician during an annual well visit; 2) to determine whether patients' intent to follow up on a colorectal cancer screening recommendation is associated with patients' preferred screening modality and physician recommendations.

Method: Eligible patients were aged 50-80, insured, and due for colorectal cancer screening at a scheduled well visit with an internal or family medicine physician practicing in Southeast Michigan. Study enrollment included a pre- and post-visit interview and office visit audio-recording. Enrolled patients' (N=415) colorectal cancer screening modality preferences were identified using attribute rankings in the pre-visit interview. Self-reported intent to follow up on screening recommendation was evaluated with a post-visit interview (N=361).

Result: At baseline 48% of patients indicated a preference for colonoscopy, 30% for FOBT, and 22% had no clear preference. Most (69%) expressed a preference for a shared decision-making approach to colorectal cancer screening. However during the visit only 14% of patients expressed a clear colorectal cancer screening test preference to their physician, and this preference was generally for FOBT (70% of those who expressed a preference). In cases where patients expressed preferences for either FOBT or colonoscopy, these preferences were acknowledged by the physician 93% of the time. The most recommended test by physicians was colonoscopy; it was discussed in all visits, and recommended in 99% of visits. A test other than colonoscopy was mentioned in 47% of visits and recommended in 30% of visits; this other test was most often FOBT. When multiple screening modalities were discussed during the appointment, physicians typically (70% of these visits) offered the patients a choice among them. Following their appointment, an overwhelming majority (95%) of patients reported they were likely to follow up on the screening recommendation. Patient modality preferences and physician modality recommendations were not associated with the intent to be screened, possibly due to a ceiling effect.

Conclusion: Patients continue to have preferences for different colorectal cancer screening options. On the other hand, physicians appear to be overwhelmingly recommending colonoscopy screening, despite their willingness to acknowledge patient modality preferences if they are raised during appointments. Further efforts to encourage patients to clarify their preferences may improve colorectal cancer screening decision making.

E. HEALTH ECONOMICS LUSTED FINALISTS

4:30 PM - 6:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *Heather Taffet Gold, PhD*
- *Myriam G.M. Hunink, PhD, MD*

Session Summary:

4:30 PM - 4:45 PM

E-1. THE COST-EFFECTIVENESS OF SYMPTOM-BASED TESTING AND ROUTINE SCREENING FOR ACUTE HIV INFECTION IN MEN WHO HAVE SEX WITH MEN IN THE UNITED STATES

4:45 PM - 5:00 PM

E-2. THE COST-EFFECTIVENESS OF A SUPERVISED CONSUMPTION SITE IN TORONTO, CANADA

5:00 PM - 5:15 PM

E-3. OPTIMAL HIV TESTING BY RISK GROUP

5:15 PM - 5:30 PM

E-4. COST-EFFECTIVENESS OF RISK-FACTOR GUIDED AND UNIVERSAL SCREENING FOR CHRONIC HEPATITIS C INFECTION IN THE U.S

5:30 PM - 5:45 PM

E-5. THE COST-EFFECTIVENESS OF PREEXPOSURE PROPHYLAXIS FOR HIV PREVENTION IN MEN WHO HAVE SEX WITH MEN IN THE UNITED STATES

5:45 PM - 6:00 PM

E-6. SOCIAL INTERACTION MODULES IN EPIDEMIC MODELS FOR THE SIMULATION OF INFECTIOUS DISEASES AND EVALUATION OF INTERVENTIONS

Abstracts:

E-1. THE COST-EFFECTIVENESS OF SYMPTOM-BASED TESTING AND ROUTINE SCREENING FOR ACUTE HIV INFECTION IN MEN WHO HAVE SEX WITH MEN IN THE UNITED STATES

4:30 PM - 4:45 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Jessie L. Juusola, MS[1], *Margaret L. Brandeau, PhD*[1], *Elisa F. Long, PhD*[2], *Douglas K. Owens, MD, MS*[3] *and Eran Bendavid, MD*[1], *(1)Stanford University, Stanford, CA, (2)Yale University, New Haven, CT, (3)Veterans Affairs Palo Alto Health Care System and Stanford University, Stanford, CA*

Purpose: Acute HIV infection often causes influenza-like illness (ILI) and is associated with high infectivity. Antiretroviral therapy (ART) substantially decreases infectivity and could reduce transmission if people with acute HIV infection could be identified promptly. We estimated the effectiveness and cost-effectiveness of strategies to identify and treat acute HIV infection in men who have sex with men (MSM) in the US.

Method: We developed a dynamic model of the HIV epidemic among MSM aged 13-64 in the US. We estimated the number of new infections, quality-adjusted life-years (QALYs), and costs for three testing approaches: viral load (VL) testing for individuals with ILI, expanded screening with antibody testing, and expanded screening with antibody and VL testing. We included treatment with ART for individuals identified as acutely infected.

Result: At the present rate of HIV-antibody testing, we estimated that 538,000 new infections will occur among MSM over the next 20 years. Expanding antibody screening coverage to 90% of MSM annually reduces new infections by 2.8% and costs $12,582 per QALY gained. Symptom-based VL testing is more expensive than expanded annual antibody testing, but is more effective and costs $22,786 per QALY gained. Combining expanded annual antibody screening with symptom-based VL testing prevents twice as many infections compared to expanded antibody screening alone, at a cost of $29,923 per QALY gained. Adding VL testing to all annual HIV antibody tests costs more than $100,000 per QALY gained.

Conclusion: Among MSM, use of HIV VL testing in persons with ILI prevents more infections than does expansion of annual antibody screening alone and is inexpensive relative to other screening interventions. Clinicians should consider VL testing in MSM with ILI, in addition to encouraging annual HIV antibody screening.

E-2. THE COST-EFFECTIVENESS OF A SUPERVISED CONSUMPTION SITE IN TORONTO, CANADA

4:45 PM - 5:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Eva Enns, MS[1], *Gregory S. Zaric, Ph.D*[2], *Jennifer A. Jairam, MSc*[3], *Gillian Kolla, MPH*[4], *Carol Strike, Ph.D, MSc*[4] *and Ahmed M. Bayoumi, MD, MSc*[5], *(1)Stanford University, Stanford, CA, (2)University of Western Ontario, London, ON, Canada, (3)St. Michael's Hospital, Toronto, ON, Canada, (4)University of*

Toronto, Toronto, ON, Canada, (5)Centre for Research on Inner City Health, the Keenan Research Centre in the Li Ka Shing Knowledge Institute, Toronto, ON, Canada

Purpose: A supervised consumption site is a legally sanctioned facility where people can consume illicit drugs under the supervision of trained staff, with the objectives of reducing the spread of blood borne infections, limiting other harms associated with drug use, and promoting safer sex practices. We evaluated the cost effectiveness of establishing one or more sites in Toronto, Canada.

Method: We developed a dynamic compartmental model of the Toronto population, accounting for the spread of Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV) among non drug-users, crack cocaine smokers, and injecting drug users. We estimated model parameters from administrative health databases, a survey of Toronto drug users, and published literature. The model was calibrated to known epidemiological data. For the base case, we assumed that the site would have a similar impact on needle sharing behaviors (70% reduction) as was observed at a site in Vancouver, Canada. Outcomes were direct healthcare costs, quality adjusted life years (QALYs), and HIV and HCV infections averted over 10 years. Costs and benefits were discounted at 3% per year. We evaluated the cost effectiveness of multiple sites by estimating the incremental costs and QALYs accrued with each additional site. We assumed that sites would be located in the highest drug using neighborhoods and estimated site usage from drug users' self-reported maximum distance that they would be willing to travel to a site.

Result: If a single site were established in Toronto, we estimated that 9% of drug users would inject in the site for a cost-effectiveness ratio of $13,800/QALY gained compared to no site. Compared to one site, establishing two sites would increase usage to 17% and was associated with a gain of 320 QALYs and an incremental cost of $4.97 million, resulting in an incremental cost-effectiveness ratio of $17,200/QALY. At a willingness to pay threshold of $50,000/QALY, it would be cost-effective to establish up to three sites (incremental cost-effectiveness ratio of $45,800/QALY).

Conclusion: The establishment of supervised consumption sites in Toronto, Canada likely represents good value for money. Given the dispersed nature of drug use in Toronto, it may be cost-effective to establish three supervised consumption sites, depending on actual site usage.

E-3. OPTIMAL HIV TESTING BY RISK GROUP

5:00 PM - 5:15 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Aaron Lucas, MS, BA *and Benjamin Armbruster, PhD, BS, Northwestern University, Evanston, IL*

Purpose: The CDC currently recommends one-time and annual HIV testing regimens for low-risk and high-risk individuals respectively. Since these recommendations were released in 2006, early initiation of highly active antiretroviral therapy (HAART) has become more common. In light of these developments we re-analyze the optimal HIV testing regimen.

Method: We build a simple mathematical model to find the optimal testing frequency for various risk groups, using annual incidence rates as proxies for risk. We focus on high-risk (1% annual incidence), moderate-risk (0.1% annual incidence) and low-risk (0.01% annual incidence) individuals. The key parameter in our model is the incremental net monetary loss (INML) of delaying detection of an HIV infection by one year. This parameter incorporates both monetary and health care costs. We calculate the optimal testing frequency for three values for INML, $4,000, $1000, and $150. We estimate an INML of

$4,000 from a scenario of early HAART initiation and consider an INML of $1000 to be a more conservative value.

Result: With an INML of $4,000, the optimal time between tests is 4 years for low-risk groups, 1.2 years for moderate-risk groups, and 0.4 years for high-risk groups. For an INML of $1,000, the optimal time between tests is 8 years, 2.4 years, and 0.8 years for low, moderate, and high-risk groups. The current CDC guidelines are close to the frequencies that would be optimal with an INML equal to $150, an implausibly low value. For an INML of $150, the optimal time between tests is 20 years for low-risk groups and 2 years for high-risk groups.

Conclusion: With a reasonable INML, our model suggests that HIV testing for low-risk individuals should be more frequent than the one-time testing currently recommended by the CDC.

E-4. COST-EFFECTIVENESS OF RISK-FACTOR GUIDED AND UNIVERSAL SCREENING FOR CHRONIC HEPATITIS C INFECTION IN THE U.S

5:15 PM - 5:30 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Shan Liu, S.M., *Lauren E. Cipriano, BSc, BA, PhD, Candidate and Jeremy D. Goldhaber-Fiebert, PhD, Stanford University, Stanford, CA*

Purpose: Over 3 million Americans are infected with chronic hepatitis C (HCV), a serious liver disease. Current U.S. guidelines recommend no screening in the general population. There is disagreement among advisory bodies regarding screening of high-risk individuals. We assessed the cost-effectiveness of universal and risk-factor guided HCV screening for asymptomatic U.S. adults (40-60 years old) at a routine medical visit.

Methods: We developed a decision-analytic Markov model that included the natural history of chronic HCV (genotype 1, 2, or 3) and advanced liver disease. We assessed the lifetime costs (2010 USD), quality adjusted life-years (QALYs) gained, and incremental cost-effectiveness ratios (ICERs) of three screening strategies: no screening, risk-factor guided screening, and universal screening. Risk factors included combinations of history of drug use, blood transfusion prior to 1992, and sexual behaviors. Analyses of the (1999-2008) National Health and Nutrition Examination Survey data provided gender- and age-specific HCV and risk factor prevalence estimates among HCV negative and positive individuals. Those individuals identified via screening who are HCV positive and eligible for treatment receive either standard therapy (peginterferon alfa and ribavirin) in the base case or standard therapy in combination with a recently-developed protease inhibitor as a scenario analysis.

Results: For men, universal screening has an ICER of $42,900/QALY compared to no screening. In order for risk-factor guided screening to be cost-effective, ≥80% of high-risk individuals must truthfully report their status. Even if all high-risk individuals reported truthfully, universal screening is still cost-effective ($47,400/QALY). For women, universal screening has an ICER of $69,100/QALY compared to no screening. Risk-based screening has an ICER approaching $100,000/QALY even if 80% of high-risk individuals truthfully reported. Newer treatments improve incremental cost-effectiveness ratios relative to

standard therapy. Screening is less cost-effective for individuals above age 50 because HCV prevalence peaks around 50 years. Low treatment acceptance, disutility of knowing one's HCV status, and high treatment costs erode screening cost-effectiveness.

Conclusions: Universal screening is likely cost-effective for both men and women at a willingness to pay threshold of $100,000/QALY. The efficiency of risk-factor guided screening depends strongly on efficiently identifying most high-risk individuals. These findings suggest that existing U.S. HCV screening guidelines should be reconsidered.

E-5. THE COST-EFFECTIVENESS OF PREEXPOSURE PROPHYLAXIS FOR HIV PREVENTION IN MEN WHO HAVE SEX WITH MEN IN THE UNITED STATES

5:30 PM - 5:45 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Jessie L. Juusola, MS[1], *Margaret L. Brandeau, PhD*[1], *Douglas K. Owens, MD, MS*[2] *and Eran Bendavid, MD*[1], *(1)Stanford University, Stanford, CA, (2)Veterans Affairs Palo Alto Health Care System and Stanford University, Stanford, CA*

Purpose: In a recent randomized controlled trial, daily oral preexposure chemoprophylaxis (PrEP) has been shown to be very effective for HIV prevention in men who have sex with men (MSM), and the US Centers for Disease Control and Prevention (CDC) recently provided interim guidance for its use among MSM who are at high risk for sexual acquisition of HIV. Previous studies failed to reach a consistent estimate of its cost-effectiveness.

Method: We used an epidemic modeling framework combined with detailed economic analysis to estimate costs and health outcomes for various PrEP strategies. We developed a dynamic model of the HIV epidemic among MSM aged 13-64 in the US, with annual HIV incidence of 0.8% in the base case, representing an average across the US. We assumed in the base case that PrEP reduces HIV infection risk by 73%, as seen among MSM reporting high adherence to PrEP. We estimated the number of new infections, quality-adjusted life-years (QALYs), costs, and incremental cost-effectiveness ratio for each strategy.

Result: If PrEP is initiated in 20% of the MSM population in the US, we estimate a reduction in new HIV infections of 21% and a gain of 893,000 QALYs over 20 years at a cost of $103,000 per QALY, given an effectiveness of 73%. Initiating PrEP in a larger proportion of the MSM population averts more infections but at increasing cost per QALY gained (more than $120,000 per QALY gained when at least 60% of the population is placed on PrEP). If PrEP is 44% effective in reducing infection risk, new HIV infections are reduced by 13% and PrEP costs $168,000 per QALY gained. PrEP has a more favorable incremental cost-effectiveness ratio in sub-groups of MSM with higher incidence, costing less than $50,000 per QALY gained when annual incidence is greater than 1.5%.

Conclusion: Use of PrEP for HIV prevention in the general MSM population is modestly expensive, but PrEP may be cost-effective by conventional standards in high-risk sub-groups of MSM.

E-6. SOCIAL INTERACTION MODULES IN EPIDEMIC MODELS FOR THE SIMULATION OF INFECTIOUS DISEASES AND EVALUATION OF INTERVENTIONS

5:45 PM - 6:00 PM: Mon. Oct 24, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS

Christoph Urach[1], *Günther Zauner*[2], *Niki Popper*[2], *Gottfried Endel*[3], *Irmgard Schiller-Frühwirth*[3] *and Felix Breitenecker*[1], (1)Vienna University of Technology, Vienna, Austria, (2)Dwh Simulation Services, Vienna, Austria, (3)Main Association of Austrian Social Security Institutions, Vienna, Austria

Purpose: Calculating cases of illnesses caused by droplet infections and evaluating the influence of interventions requires dynamic simulation models. The aim of the work is to develop a module to simulate social interaction in epidemic disease propagation and show that models using such complex structures can provide different and more accurate results than calculations neglecting social networks.

Method: Data from EU-project POLYMOD (SP22-CT-2004-502084) about contacts between people and their location is thoroughly analyzed. We use agent-based modeling to create the social interaction sub model due to the very inhomogeneous contact structure as well as the necessity to create a flexible, extensible module. Data from Statistik Austria and structural knowledge about places is used to create different work places, schools, households and places for leisure activities. Each place type has its own structure. For example the place type school defines a structure which consist of several classes with pupils and teachers which change classes according to their movement rules. The social interaction model uses many realizations of the place type school with different parameters for school and class sizes as well as the age structure of the pupils according to data from Statistik Austria. The spread of the disease happens through contacts between infected and susceptible people who are at the same place at the same time.

Result: Social networks are established through places where people meet regularly. The model does not only allow simulating the quickness of the spread of diseases but also locate places where many potential infectious contacts occur. It also helps identifying key people who are responsible for many infections as well as simulating the outcome of interventions. Actual this social module is used in a model for influenza. At some places and especially in schools many infections occur. Simulating scenarios where teachers are vaccinated or schools are closed show that the pace of the epidemic can be slowed down.

Conclusion: Spread of diseases through contacts between individuals can be more properly assessed when simulating contact places. Especially the evaluation and simulation of interventions which target only certain population groups or locations and therefore affect some people more than others benefit from social interaction models. Due to the modular design the contact model can be adapted and used for other droplet infections.

F. BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

4:30 PM - 6:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Session Chairs:

- *Alan Schwartz, PhD*
- *Angela Fagerlin, PhD*

4:30 PM - 4:45 PM

F-1. TRADING OFF LIFE STYLE OPTIONS TO REDUCE THE RISK OF CHD IN NORTHERN IRELAND

4:45 PM - 5:00 PM

F-2. IGNORANCE IS BLISS: WHY DO PATIENTS AT RISK FOR HUNTINGTON DISEASE AVOID GENETIC TESTING?

5:00 PM - 5:15 PM

F-3. METABOLIC MECHANISMS OF INTERTEMPORAL CHOICE: BLOOD GLUCOSE AND DELAY DISCOUNTING

5:15 PM - 5:30 PM

F-4. A RANDOMIZED TRIAL OF DEFAULT OPTIONS IN ADVANCE DIRECTIVES FOR PATIENTS WITH TERMINAL LUNG DISEASES

5:30 PM - 5:45 PM

F-5. "NUDGING" PATIENTS TOWARDS ACCEPTING STRONG RECOMMENDATIONS

5:45 PM - 6:00 PM

F-6. CAN THE RESULTS OF LABORATORY BASED MESSAGE FRAMING EXPERIMENTS BE GENERALIZED TO PATIENTS?

Abstracts:

F-1. TRADING OFF LIFE STYLE OPTIONS TO REDUCE THE RISK OF CHD IN NORTHERN IRELAND

4:30 PM - 4:45 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

Alberto Longo, PhD, *Jose Grisolia and W. George Hutchinson, Professor, Queen's University Belfast, Belfast, Northern Ireland*

Purpose: To assess the Willingness To Pay (WTP) to reduce Coronary Heart Disease (CHD) risk and to assess the Value of a Statistical Life (VSL) for CHD risk reductions from changing dietary habits and amount of physical activity in the Northern Ireland.

Method: A stratified sample of 519 persons representative of the Northern Ireland population aged 40-65 were administered with a Choice Experiments (CE) questionnaire through computer assisted personal interviews, conducted in the house of the respondents, during January – March 2011. Respondents were queried about their medical history, eating habits, and levels of physical activity to present them with their own CHD risk in the next ten years. Respondents were then shown ten CE questions where they were asked to trade off their current lifestyle with hypothetical lifestyle options, described by reduction in unhealthy food items, increase in the consumption of fruit and vegetables, increase in the amount of physical activity, reduction in the risk of a heart attack, and increase in weekly expenditures. We use Mixed logit models to analyze the CE data.

Result: Respondents are on average willing to pay £0.03/minute per week for increasing their amount of Physical Activity, which is equal to £5.18 to reach the recommended amount of 30 minutes of Physical Activity 5 times/week. Respondents need to be compensated, as they have a WTP equal to £-0.01/gram of fat per week, for reducing fat content from diet and replacing fatty items with fruit and vegetables. Respondents are also willing to pay £0.81 per week for reducing their own CHD risk by 1% over the next 10 years. When controlling for income, BMI, and health status, we find that respondents with higher BMI levels are willing to pay more for increasing their amount of physical activity, and need to receive higher compensations for reducing fat content from their diets. Considering a 3.5% discount rate, the VSL is equal to £610,944.

Conclusion: A policy to reduce obesity should invest more public money in programs that promote physical activity, rather than making unhealthy food less attractive. Our results show that people with high BMI levels are more likely to choose a lifestyle option characterized by increased levels of physical activity, rather than by a food basked that entails a sacrifice in terms of reduced fat content.

F-2. IGNORANCE IS BLISS: WHY DO PATIENTS AT RISK FOR HUNTINGTON DISEASE AVOID GENETIC TESTING?

4:45 PM - 5:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

Lorens A. Helmchen, Ph.D., *George Mason University, Fairfax, VA and Avraham Stoler, Ph.D., De Paul University, Chicago, IL*

Purpose: To examine why so few individuals at risk of Huntington disease (HD) seek genetic testing and why the propensity to test increases with the belief of carrying the gene.

Methods: HD is an inherited disorder generally characterized by the adult onset of impaired movement and cognitive decline that commonly leads to institutional care and eventually death within 20 years. A genetic test that can confirm or rule out with near-certainty whether an individual will develop HD is inexpensive and widely available. As the disease has no cure, the test does not help improve treatment but it can guide individuals in their decisions about education, marriage, fertility, savings, and retirement. Given the disease's

substantial mortality and morbidity impact, neo-classical models predict that individuals at risk of HD value genetic testing highly, yet fewer than 10% opt for the test. Moreover, the propensity to test has been observed to increase with individuals' belief that they will develop HD, contradicting neo-classical predictions. Using survey data from 64 untested individuals at risk of HD (mean age: 44 years; 42% male; 84% white; mean years of education: 14.5), we test whether respondents' stated advantages and disadvantages of testing for HD reveal an asymmetry between the perceived loss in utility of confirming the eventual onset of HD and the perceived utility gain of ruling it out. We also test whether the stated advantages and disadvantages of testing vary with respondents' experience of symptoms, which inform their beliefs about HD.

Results: 53% of respondents feared "depression after confirming HD", while only 5% of respondents explicitly mentioned the possibility of "feeling much better" after ruling it out. Moreover, after controlling for respondent demographics, symptomatic respondents were substantially and significantly less likely than non-symptomatic respondents to fear depression after confirming HD (-36 percentage points, p=0.006), while respondents rarely considered the possibility of "feeling much better" as an advantage of testing regardless of symptom onset (-4 percentage points, p=0.439). We show that a simple modification of the neo-classical model in which individuals assign greater weight to losses relative to gains can account for these survey response patterns.

Conclusion: Survey responses of individuals at risk of HD are consistent with Prospect Theory, in which subjects systematically overweight the losses relative to the gains of genetic testing.

F-3. METABOLIC MECHANISMS OF INTERTEMPORAL CHOICE: BLOOD GLUCOSE AND DELAY DISCOUNTING

5:00 PM - 5:15 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

X.T. Wang, Ph.D.[1], Shu Li, Ph.D.[2] and Lilin Rao[2], (1)University of South Dakota, Vermillion, SD, (2)Chinese Academy of Sciences, Beijing, China

Purpose: In two studies, we examined metabolic mechanisms of intertemporal choice within a synthetic framework of life-history theory and risk sensitive foraging theory. In a previous study (Wang & Dvorak, 2010) we identified a novel link between blood glucose (GB) levels and delay (future) discounting. People discount the future when they prefer a smaller and sooner (SS) reward to a larger but later (LL) reward when making intertemporal choices. We found that a sugar drink reduced delay discounting, making the LL options more attractive whereas a diet drink increased delay discounting, making the SS options more preferable. Based on these findings, we predict that when the body energy budget is low, the delay discounting rate would increase to get immediate supply, and vice versa.

Method: In Study 1, we examined the effects of varying BG levels on delay discounting in natural conditions measured by subjective ratings of hunger and actual temporal distance from the last meal. In Study 2, we checked the BG levels of the participants before making a hypothetical investment decision of allocating a certain amount of tax return for immediate use vs. short-term or/and long-term saving. We also examined the issue of resource allocation. The participants were asked to answer questions about contents and intension of a conversion between a man and a woman portrayed in a photo.

Result: The results from Study 1showed that the temporal distance but not subjective hunger perception was significantly and positively correlated with delay discounting. Results from Study 2 showed that the

participants with higher BG levels were more likely to save the money for future use. The participants who were low in the BG levels were more likely to interpret the conversation in terms of sexual nature.

Conclusion: Fluctuating blood glucose levels continuously inform the brain about body energy budget, and allow the brain to regulate intertemporal choice adaptively by adjusting delay discounting rate and by making trade-offs between survival-related calorie intake and reproduction-related mating processes.

F-4. A RANDOMIZED TRIAL OF DEFAULT OPTIONS IN ADVANCE DIRECTIVES FOR PATIENTS WITH TERMINAL LUNG DISEASES

5:15 PM - 5:30 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

Scott D. Halpern, MD, PhD, MBE[1], *Kevin Volpp, MD, PhD*[1], *George Lowenstein, PhD*[2], *Elizabeth Cooney, MPH*[1], *Tatiana Silva, MPA*[1], *Robert M. Arnold, MD*[3], *Derek C. Angus, MD, MPH, FRCP*[3] *and Cindy L. Bryce, PhD*[3], *(1)University of Pennsylvania School of Medicine, Philadelphia, PA, (2)Carnegie Mellon University, Pittsburgh, PA, (3)University of Pittsburgh School of Medicine, Pittsburgh, PA*

Purpose: To examine how default options affect chronically ill patients' goals of care and elections to receive specific interventions when completing real advance directives (ADs).

Methods: Randomized trial of patients with non-curable lung diseases recruited from pulmonary and oncology clinics. Patients were assigned with equal probabilities to complete (1) an opt-out AD (modeled on the Allegheny County Medical Society's advocated form) in which the default goal of care prioritized extending life "even if that means I may have more pain and suffering," and patients could opt out individually from 5 interventions (e.g., mechanical ventilation); (2) an opt-in AD in which the default goal of care prioritized comfort "even if that means not living as long" and patients could opt into 5 interventions; or (3) a neutral AD in which patients not making active choices effectively were choosing not to specify a plan of care or intervention preference.

Results: Among 130 patients enrolled, 38 (29%) completed an AD that was signed by their surrogates and incorporated into their medical records. Non-completion rates were similar across the 3 arms (all $p > 0.5$), and intention-to-treat analyses produced results similar to the per-protocol analyses reported here. Patients completing opt-in ADs (78%) were the most likely to select the comfort-oriented plan of care, followed by patients completing neutral ADs (57%) and opt-out ADs (20%) ($p < 0.001$ for trend). Patients completing opt-in rather than opt-out AD's were more likely to choose to forgo ICU admission, dialysis, and feeding tube insertion (all $p < 0.05$); corresponding but non-significant findings were noted for mechanical ventilation ($p = 0.074$) and cardiopulmonary resuscitation ($p = 0.088$). Patients completing neutral ADs had probabilities of forgoing each service that were intermediate between those for patients completing opt-in and opt-out ADs.

Conclusions: Building on prior research in hypothetical settings, this study provides the first randomized evidence that default options influence real healthcare decisions. Future research is needed to identify methods for increasing AD completion and to quantify how altering the choices patients make in ADs influence their receipt of wanted and unwanted healthcare services, costs of care, and satisfaction with care.

F-5. "NUDGING" PATIENTS TOWARDS ACCEPTING STRONG RECOMMENDATIONS

5:30 PM - 5:45 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

Liana Fraenkel, MD, MPH, *Yale School of Medicine, New Haven, CT, Ellen Peters, Ph.D., Decision Research, Eugene, OR and Valerie Reyna, PhD, Cornell University, Ithaca, NY*

Purpose: American College of Rheumatology guidelines "strongly recommend" aggressive care with disease modifying anti-rheumatic drugs (DMARDs) in order to achieve and maintain tight control in rheumatoid arthritis (RA). Despite the widespread endorsement of this approach, data suggest that many patients are not effectively treated. There are currently no proven mechanisms to effectively inform patients and enable them to process the complex information involving decisions related to escalating care. The objective of this study is to develop a decision tool to effectively inform and "nudge" RA patients with active disease to accept additional therapy.

Methods: We first performed a systematic review to generate the outcome data and risk estimates required for the tool. A Delphi panel of experts was used to determine which AEs should be represented to all subjects to ensure informed consent. Additional information can be accessed through links for those desiring additional information. Probabilistic information is presented using theoretically motivated manipulations; e.g.: bar graphs to emphasize relative benefits and pie charts to emphasize the denominator. Participants perform a Best-Worst scaling exercise after viewing the informational content to clarify their priorities. We conducted a pre-post test pilot study to assess the feasibility, acceptability, and preliminary evidence of the tool's efficacy in improving informed choice.

Results: We interviewed 104 subjects; mean age (SD) = 62 (12); 84% female, 86% White; median duration of RA =13 years (range 1-61). Knowledge (sum of correct responses to 20 questions) and willingness to take a biologic (11-point numeric rating scale) significantly improved after viewing the tool (mean differences 3.1 and 1.4 respectively, both $p < 0.0001$). Decisional conflict (informed and value subscales) also significantly decreased (mean differences 20.4 and 20.7, both $p<0.001$). Increased willingness to take a biologic was greater among younger adults and those with a college education. Improvement in knowledge was seen across ages and educational backgrounds. Over 90% of participants ratings; related to the quality and quantity of information were very good or excellent. 89% found the tool to be very helpful and all would recommend it for patients with RA.

Conclusion: A tool designed based on the principles of Fuzzy Trace theory to nudge patients towards accepting "strong recommendations" increased knowledge, decreased decisional conflict, and increased patient willingness to escalate care in a pre-post test setting.

F-6. CAN THE RESULTS OF LABORATORY BASED MESSAGE FRAMING EXPERIMENTS BE GENERALIZED TO PATIENTS?

5:45 PM - 6:00 PM: Mon. Oct 24, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMIC AND DECISION PSYCHOLOGY APPROACHES TO CHOICE

Richard W. Martin, MD, MA[1], *Patience J. Gallagher, B.S.*[2] *and Donald J. Tellinghuisen, PhD*[2],
(1)Michigan State University, Grand Rapids, MI, (2)Calvin College, Grand Rapids, MI

Purpose: To explore the validity of generalizing the results from first year psychology students in message framing laboratory experiments to patient decision aid design.

Method: 91 first year psychology students and 91 rheumatoid arthritis (RA) patients participated in a prospective randomized, single blind, factorial experimental design evaluating the effect of four information formats on: satisfaction with risk communication and verbatim and gist recall of a hypothetical drug's ability to slow the rate of progression of structural joint damage (SJD). The study was conducted in 2 different settings using similar experimental procedures. College students enrolled in an introductory psychology class were evaluated in a traditional experimental laboratory setting. Patients were evaluated in a conference room adjacent to the clinic waiting room following a routinely scheduled clinic visit.

Result: Demographics of students and patients were respectively: Mean age 19.4 years (18-25) vs. 61.7 years (18-86), female gender 50.5 vs. 60.0%, minority ethnicity 1.1 vs. 5.4%. Less than high school graduate 0 vs. 10.0%, low or marginal health literacy N/A vs. 4.4%. Patients had a mean duration of disease of 9.6 year (range < 1 -30) and previous had used a mean of 3 disease modifying drugs (range 1-8). A two-way ANOVA performed on mean satisfaction with risk communication scores did not disclose a significant effect of participant type [$F (1, 174) = .109$, $p = .742$, p2 = .001)]. Participants across conditions overestimated the rate of progression by 19 percentage points (M response of 34.4%, SD 29.7). The two-way ANOVA of mean verbatim recall indicated a significant effect of information format, $F (3, 174) = 2.774$, $p < 0.023$, p2 = .053. The main effect of participant type however was not significant, $F (1, 174) = .003$, $p = .955$, p2 > .001.

Conclusion: Graphic elements improved the understanding of disease progression in participants unfamiliar with the disease as well as in RA patients. Our results indicate that testing decision aid components with non-patients may provide data generalizable to patient populations from more convenient samples than patients. We demonstrate that it is not only feasible to conduct message framing experiments with patients in a clinical setting, but that they were very interested in contributing to the development of medication patient decision aids.

Tuesday, October 25, 2011

BD3. INVITED SESSION: TBD 3

10:00 AM - 11:30 AM: Tue. Oct 25, 2011
Columbus Hall AB (Hyatt Regency Chicago)

G. VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

10:00 AM - 11:30 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Anne M. Stiggelbout, PhD*
- *Margaret M. Byrne, PhD*

Session Summary:

10:00 AM - 10:15 AM

G-1. EFFECT OF CHRONIC CONDITIONS ON THE VALUATION OF HYPOTHETICAL EQ-5D HEALTH STATES

10:15 AM - 10:30 AM

G-2. COMPARATIVE PERFORMANCE OF CONJOINT ANALYSIS, TIME TRADE OFF, AND RATING SCALE METHODS OF PREFERENCE ASSESSMENT: PILOT DATA FROM A STUDY OF MEN AT RISK FOR PROSTATE CANCER

10:30 AM - 10:45 AM

G-3. PREDICTING UTILITY SCORES FOR PROSTATE CANCER: MAPPING THE PROSTATE CANCER INDEX TO THE PATIENT ORIENTED PROSTATE UTILITY SCALE (PORPUS)

10:45 AM - 11:00 AM

G-4. SPILLOVER DISUTILITY OF CHRONIC CONDITIONS IN US: MENTAL DISORDERS HAVE GREATEST EFFECT ON FAMILY MEMBERS

11:00 AM - 11:15 AM

G-5. PREFERENCES FOR BREAST CANCER CHEMOPREVENTION

11:15 AM - 11:30 AM

G-6. ATTRIBUTE PROCESSING IN CHOICE EXPERIMENTS: A METHODOLOGICAL EXPLORATION

Abstracts:

G-1. EFFECT OF CHRONIC CONDITIONS ON THE VALUATION OF HYPOTHETICAL EQ-5D HEALTH STATES

10:00 AM - 10:15 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Rima Tawk, PhD, *James W. Shaw, PhD and A. Simon Pickard, PhD, University of Illinois at Chicago, Chicago, IL*

Purpose: There is evidence that patient preferences are systematically higher than societal preferences for a patient's self-reported health state, possibly due to adaption to chronic illness by patients. It is less clear whether stated preferences for hypothetical health states differ between persons with and without specific conditions. The aim of this study was to determine if presence of specific chronic conditions affected the values estimated for hypothetical EQ-5D health states.

Methods: Data were taken from the US Valuation of EQ-5D Health States. Study participants (N = 3,773) comprised a probability sample of the US adult population in 2002. Each participant valued 12 of a subset of 45 of the 243 EQ-5D health states in a TTO exercise and reported on the presence or absence of 18 chronic conditions. A novel conceptual model was developed to explain the direct and indirect effects of illness experience on values for hypothetical health states. The analyses focused on six conditions: arthritis, diabetes, depression, congestive heart failure, cancer, and allergic rhinitis. Multivariable linear regression was used to estimate differences in health state preferences among persons with a given condition alone, that condition plus one or more other conditions, one or more other conditions, or no chronic conditions while controlling for the satisfaction attributed to own health, other interpersonal differences, and the perceived severity of the valued states. All analyses accounted for the complex sampling design of the US EQ-5D valuation study.

Results: There were no statistically significant differences in mean health state preferences among the four condition-related strata for any of the six chronic conditions. No trend towards adaptation was suggested among those with specific conditions as the direction of the relationship was inconsistent. The strongest predictors of health state preferences were race/ethnicity, age, and marital status.

Conclusions: Results suggest self-reported chronic conditions have a trivial impact on preferences for hypothetical health states while race/ethnicity has a strong effect, consistent with results of a previous study. These results have important implications for researchers who seek to use patient preferences to generate preference-weighting algorithms for condition-specific health state classifiers. However, due to data limitations, including reliance on self-reported data and lack of data on severity/treatment of disease, further investigation is needed.

G-2. COMPARATIVE PERFORMANCE OF CONJOINT ANALYSIS, TIME TRADE OFF, AND RATING SCALE METHODS OF PREFERENCE ASSESSMENT: PILOT DATA FROM A STUDY OF MEN AT RISK FOR PROSTATE CANCER

10:15 AM - 10:30 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Christopher S. Saigal, MD, MPH[1], *Ely Dahan, PhD*[1], *Kate Crespi, PhD*[1], *Sylvia Lambrechts, MPH, MA*[1], *Elizabeth Garcia, BS*[1] *and Robert M. Kaplan, PhD*[2], *(1)UCLA, Los Angeles, CA, (2)University of California Los Angeles, Los Angeles, CA*

Purpose: Existing "gold standard" preference assessment methods may suffer from problems with validity and reliability. Conjoint analysis, a method of consumer preference measurement, may have superior comparative performance characteristics. We aimed to conduct a randomized comparison of methods in men at risk for prostate cancer.

Method: Men who had undergone treatment for localized prostate cancer were interviewed individually to identify attributes of prostate cancer treatment that were critical to patients. Using these attributes, we developed 3 preference assessment applications: rating scale (RS), time trade-off, (TTO) or conjoint analysis-

based (CA). These applications were first piloted in men who had been treated for prostate cancer. We then randomized men who had undergone prostate biopsy with negative results to preference assessment with the CA and either TTO or RS applications.   Validity of preference measurement was compared by assessing the ability of the utility functions derived from each application to successfully predict the patient's preference for novel multi-attribute health states that he had not yet seen or rated. We compared the internal consistency and predictive validity of each method at the individual level as well as the perceived difficulty and effectiveness of each task. We compared the most important treatment attributes identified by each method.

Result: 17 subjects have been randomized to date. Average age was 64 years, range 55 – 71, 29% were Caucasian, 47% were African-American, 25% other. Educational attainment was 12% High School, 53% some college, 35% college graduate.   The CA and RS methods had high internal consistency compared with TTO (average $r2$ of 85% (CA), 86% (RS) and 44% (TTO). Utility functions derived from CA and RS were superior at prediction of preference for novel multi-attribute health states compared with that of TTO.   The most important three attributes to patients as determined using CA were effect on urinary function, sexual function and surgery avoidance. These differed from those identified using RS and TTO in the inclusion of surgery avoidance instead of bowel function. Patients felt CA was the most difficult method, but also the most effective at expressing their values.

Conclusion: Conjoint analysis is a feasible method of preference assessment in men at risk for prostate cancer, and is viewed as effective by such patients. Both RS and CA outperform TTO based on preliminary results**.**

G-3. PREDICTING UTILITY SCORES FOR PROSTATE CANCER: MAPPING THE PROSTATE CANCER INDEX TO THE PATIENT ORIENTED PROSTATE UTILITY SCALE (PORPUS)

10:30 AM - 10:45 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Murray D. Krahn, MD, MSc, University of Toronto, Toronto, ON, Canada, Karen E. Bremner, BSc, University Health Network, Toronto, ON, Canada, Nicholas Mitsakakis, MSc, PHD, Toronto Health Economics and Technology Assessment Collaborative, Toronto, ON, Canada and Leslie S. Wilson, PhD, University of California San Francisco, San Francisco, CA

Purpose: The Patient Oriented Prostate Utility Scale (PORPUS-U) is a 10-item disease-specific multiattribute utility instrument with utility weights from prostate cancer patients. The Prostate Cancer Index (PCI) is a descriptive quality of life instrument producing function and bother scores ranging from 0 (poor outcome) to 100 (good outcome) for urinary, sexual, and bowel problems. The study objective was to develop a function to predict utility scores from PCI scores.

Method: We used patient-level data from previous studies in which the PCI and PORPUS were administered concurrently. Study 1 included 248 prostate cancer patients from an outpatient clinic interviewed on 3 occasions within 18 months. Study 2 included 676 community-dwelling prostate cancer patients who completed the questionnaires by mail. The derivation sample (Study 2) was used to fit three linear regression models, chosen based on previous work. Study 1 data were used to validate the models. PCI scores were divided by 100 to range from 0 to 1. One model used the original PORPUS-U scores, and two used log-transformed PORPUS-U scores, one with a hierarchy constraint and one without. Also, all models were run with and without patient age. Model selection was performed with PORPUS-U score as the dependent

variable and PCI score as the covariate, using stepwise selection and 5-fold cross validation. The predictive ability of the models was assessed.

Result: The best-fitting model used the log-transformed PORPUS-U with no hierarchy constraint. Inclusion of age did not improve the model. Scores were untransformed for validation, and Dunn's smearing estimator applied to correct potential bias in the estimate. The r-squared was 0.72. The RMSE ranged from 0.041 to 0.061 for the 3 validation datasets.   We compared the observed PORPUS-U scores to scores predicted from PCI responses. The mean predicted and observed scores were similar (eg., 0.966 vs 0.956). The mean predicted scores were also similar across quartiles of observed scores but slightly overestimated the lowest 5% of observed PORPUS-U scores.

Conclusion: We developed an algorithm to predict PORPUS-U utility scores from PCI scores. This facilitates the estimation of patient-derived utilities for clinical and health economic studies from the many published studies using the PCI. This is also, to our knowledge, the only attempt to map a disease-specific quality of life instrument to a disease-specific utility measure.

G-4. SPILLOVER DISUTILITY OF CHRONIC CONDITIONS IN US: MENTAL DISORDERS HAVE GREATEST EFFECT ON FAMILY MEMBERS

10:45 AM - 11:00 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Eve Wittenberg, PhD, MPP, *Heller School for Social Policy and Mgmt., Waltham, MA and Lisa Prosser, PhD, University of Michigan, Ann Arbor, MI*

Purpose: Caregivers report diminished quality of life and negative physical effects of caring for ill individuals. This study measured the spillover disutility of chronic conditions on household members in the US.

Method: Medical Expenditures Panel Survey (MEPS) data from 2000-2003 were analyzed to identify the independent effect of the presence of individuals with categories of chronic conditions (by ICD 9 codes) on household members' utility scores. Bivariate regressions of categories of conditions on adults' utility scores were conducted to identify those which significantly affected utility for inclusion in the multivariable model. A two-stage, multivariable regression model was built to predict EuroQol-5D index weights (EQ-5D) based on the presence of mental health and non-mental health chronic conditions within the household while controlling for other known predictors of utility (including own health status).

Result: In bivariate analyses, mental disorders was the only category of household chronic conditions that significantly affected adults' utility scores, so multivariable models included mental and non-mental disorders as categories of conditions. In the first-stage, logistic model, the presence of at least one child in the household with a chronic mental health condition decreased the odds of a co-habiting adult reporting perfect health by 28% (OR for EQ-5D score of 1.0=0.72, 95%CI=0.62,0.82); the presence of an adult in the household with a chronic mental health condition decreased the odds of other adults reporting perfect health by 34% (OR=0.66, 95%CI=0.59,0.73). In the second-stage, linear model, among adults reporting less-than-perfect health (EQ-5D score<1.0), the presence of a child or adult with a mental health condition in the household reduced their EQ-5D score by 0.02 (95%CI =-0.03,-0.01 for both). In comparison, chronic non-mental health conditions among children and adults in the household reduced co-habiting adults' odds of reporting perfect health by 12-13% (95%CI for child= 0.81,0.94, for adult=0.82,0.92), and among those

reporting less-than-perfect health, a child with non-mental health condition had no spillover effect on adults and an adult reduced others' EQ-5D score by 0.01 (95%CI=-0.01,0).

Conclusion: In a US national sample, all health conditions produced spillover disutility on household members, but mental disorders more substantially affected parents, spouses and other adults in the household. Benefits of mental health interventions may be more accurately captured by including the spillover effects of these conditions on family members.

G-5. PREFERENCES FOR BREAST CANCER CHEMOPREVENTION

11:00 AM - 11:15 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Sarah T. Hawley, PhD, MPH[1], Holly Witteman, PhD[2], Andrea Fuhrel-Forbis[2], Christine Holmberg, DPhil, MPH, MA[3], Peter A. Ubel, MD[4] and Angela Fagerlin, PhD[5], (1)University of Michigan, Ann Arbor VA Health System, Ann Arbor, MI, (2)University of Michigan, Ann Arbor, MI, (3)Berlin School of Public Health, Berlin, Germany, (4)Duke University, Durham, NC, (5)Internal Medicine, Ann Arbor, MI

Purpose: To assess women's preferences for breast cancer chemoprevention (i.e., tamoxifen or raloxifene) using conjoint analysis.

Methods: Eight attributes related to taking a pill to prevent breast cancer were identified and assigned levels (lifetime risk of breast cancer, length of time the pill must be taken, breast cancer risk reduction, risk of endometrial cancer, risk of blood clots, risk of hormone symptoms, risk reduction of bone fractures, and availability of a biomarker). The SAS conjoint analysis program was used to develop a balanced and efficient design consisting of 36 scenarios. Each scenario presented a hypothetical pill description, including each of the 8 attributes with different levels, and asked respondents to indicate how likely they would be to take that pill on a scale of 0 (not at all likely) to 9 (very likely). A randomized block design was used to equally divide the 36 scenarios. An Internet sample of women aged 40-74 was invited to complete one set of 18 scenarios plus a dominant scenario. The responses were combined and conjoint analysis was used to generate attribute importance scores and part-worth utilities of each level.

Results: The 1365 respondents had a mean age of 57 and 78% were white. The mean value for likelihood of taking the pill was 5.5 (SD 3.2) for the dominant scenario and ranged from 2.1 (SD 2.4)-5.7 (SD 2.4) for other scenarios. The order of attribute importance was lifetime risk (17.4%), time (17%), risk of blood clots (12.3%), risk of endometrial cancer (12%), breast cancer risk reduction (11.2%), biomarker availability (10.9%), reduction in bone fracture risk (9.7%) and risk of hormone symptoms (9.7%). Part-worth utility values indicated that women preferred a pill with the following features: 90% breast cancer risk reduction, had a biomarker, no additional risks for all side effects, and could be taken for 1 year.

Conclusions: There was low interest in taking a pill as a means of preventing breast cancer in this Internet sample even when the pill had high benefits and low risks. The similarity of attribute importance values suggests that all were somewhat important, with lifetime risk of breast cancer and serious, but rare, side effects being most important. Further research evaluating associations between preferences and chemoprevention adherence in high risk patients is needed.

G-6. ATTRIBUTE PROCESSING IN CHOICE EXPERIMENTS: A METHODOLOGICAL EXPLORATION

11:15 AM - 11:30 AM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: VALUES, PREFERENCE ELICITATION AND UTILITY ASSESSMENT

Kirsten Howard, PhD and Glenn P. Salkeld, PhD, The University of Sydney, Sydney, Australia

Purpose: In analysing DCE, we typically assume that individual respondents evaluate each and every attribute offered in each alternative, and choose their most preferred. This study explores the effect of respondent attribute processing, using 'attribute importance', on parameter estimation, model fit and marginal rates of substitution (MRS), in colorectal cancer screening

Methods: The survey, a fractional factorial design of a two-alternative, unlabeled experiment, was mailed to a sample of 1920 subjects in NSW, Australia. Attributes included: test accuracy for cancer and for large polyps, false positive rate, cost, dietary & medication restrictions and sample collection. The importance of each attributes was assessed using a Likert scale, where 1= very important and 5 = not important at all, dichotomised for analysis (1-2 = important, 3-5= not important/neutral). Two analyses were conducted where it was assumed that 1) all attributes are attended to and influence choices (usual analysis practice); and 2) attributes were stratified by their importance on the Likert scale, using interaction terms to indicate whether attributes were important, or not. Mixed logit models were used to estimate preferences.

Results: 1152 from 1920 surveys (60%) were returned. Both choice models significantly predicted respondent test preferences. In comparing models, Model 2 was significantly better than Model 1 (chi-square equal to 485.4 (with 6 degrees of freedom, $p<0.00001$). There was also an improvement in McFadden's pseudo R^2 with Model 2; the reduction in AIC moving from Model 1 to Model 2 indicated that this improvement remained even after penalising for the loss of parsimonious specification. Respondents who reported the attribute was important to them had significantly higher parameter estimates compared to those who considered the attribute not important or neutral. This was consistent across all attributes, and also resulted in significant differences in MRS and WTP.

Conclusions: Rather than assuming all attributes are equally attended to by respondents, our analysis suggests that taking account of respondent-reported attribute importance (as a proxy for attribute processing) may result in models that better explain respondent's choice behaviour and preferences. This issue and other attribute processing strategies should be further explored in different settings and data sets

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H. COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

10:00 AM - 11:30 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *Matt Stevenson, PhD*
- *Allison B. Rosen, MD, ScD*

Session Summary:

10:00 AM - 10:15 AM

H-1. COST-EFFECTIVENESS OF PRIMARY HUMAN PAPILLOMAVIRUS (HPV) TESTING IN NORWAY

10:15 AM - 10:30 AM

H-2. COST-EFFECTIVENESS OF USING TRANEXAMIC ACID INFUSION IN TRAUMA PATIENTS WITH SIGNIFICANT HEMORRHAGE

10:30 AM - 10:45 AM

H-3. COST-EFFECTIVENESS OF OMALIZUMAB FOR THE TREATMENT OF ADULTS WITH MODERATE TO SEVERE PERSISTENT ASTHMA: RESULTS FROM A RANDOMIZED CONTROLLED TRIAL IN JAPAN

10:45 AM - 11:00 AM

H-4. COST-EFFECTIVENESS OF SCREENING STRATEGIES FOR PEDIATRIC DYSGLYCEMIA

11:00 AM - 11:15 AM

H-5. A PORTFOLIO APPROACH TO HIV CONTROL IN SOUTH AFRICA

11:15 AM - 11:30 AM

H-6. USE OF DEDICATED WINGS TO MAXIMIZE INSTITUTIONAL OBJECTIVES UNDER STRAINED BED CAPACITY

Abstracts:

H-1. COST-EFFECTIVENESS OF PRIMARY HUMAN PAPILLOMAVIRUS (HPV) TESTING IN NORWAY

10:00 AM - 10:15 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

Emily Burger, MPhil[1], Jesse D. Ortendahl, BS[2], Stephen Sy, BS[2], Ivar Sønbø Kristiansen, MD, PhD, MPH[1] and Jane J. Kim, PhD[2], (1)University of Oslo, Oslo, Norway, (2)Harvard School of Public Health, Boston, MA

Purpose: Since 1991, the Norwegian Coordinated Cervical Cancer Screening Program has invited women to cytology-based screening every three years. Although a reduction in cervical cancer has been observed, it remains among the top three most frequent cancers for women aged 25-49 and may be further reduced by new screening technologies. In addition, vaccination against human papillomavirus, the necessary cause of cervical cancer, may impact optimal screening strategies. We evaluated the cost-effectiveness of alternative primary screening strategies for vaccinated and unvaccinated women to inform policy recommendations in Norway.

Method: We used likelihood-based methods to calibrate a first-order Monte Carlo simulation model to reflect the natural history of HPV-induced cervical cancer in Norway. The current screening strategy involving cytology only was compared to a strategy involving cytology at younger ages, followed by a switch to primary HPV-based screening, an option being actively considered by the Norwegian government. Pre-switch screening strategies included varying the management protocols for mildly abnormal results. Post-switch screening strategies included varying the age at which women switch to primary HPV testing (31 or 34 years), screening interval (3-6 years), and triage strategies for women with HPV-positive results. All costs were considered from the societal perspective. Additional sensitivity analysis included varying screening laboratory costs to reflect potential discrepancies between published reimbursement rates and true economic costs.

Result: Current cytology-only screening was less effective and more costly than proposed strategies that involve switching to primary HPV testing in older ages. For unvaccinated women, switching at age 31 to primary HPV testing every 4 years with cytology as a triage for HPV-positive results was most cost effective at 460,000NOK/YLS (≈$72,000/YLS) given a Norwegian cost-effectiveness threshold of approximately 500,000NOK/YLS (≈$78,000/YLS). For vaccinated women, the preferred screening strategy was the same, but with intervals widened to every 6-years after the switch age of 31. Strategies involving immediate diagnostic referral of young women with mildly abnormal cytology results were not cost-effective. By using published reimbursement rates for laboratory costs that were lower than our base-case estimates, we found that the optimal strategy for vaccinated women allowed for more intensive follow-up of HPV-positive women.

Conclusion: Strategies involving a switch to HPV testing for primary screening in older women is expected to be cost-effective, compared with current screening recommendations in Norway.

H-2. COST-EFFECTIVENESS OF USING TRANEXAMIC ACID INFUSION IN TRAUMA PATIENTS WITH SIGNIFICANT HEMORRHAGE

10:15 AM - 10:30 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

María Clara Mendoza Arango, MD[1], *Shihchen Kuo, RPh, MSCP*[1], *Carlos H. Morales Uribe, MD, MS*[2], *Juan C. Puyana, MD*[1] *and Kenneth J. Smith, MD, MS*[1], *(1)University of Pittsburgh, Pittsburgh, PA, (2)University of Antioquia, Medellin, Colombia*

Purpose: Tranexamic acid (TXA) is an antifibrinolytic agent that decreased mortality in trauma patients with increased bleeding risk. We sought to determine cost effectiveness of general implementation of this pharmacological strategy in trauma patients with significant bleeding.

Methods: We developed a decision-analytical model to compare implementation of TXA infusion with no TXA infusion in trauma patients, modeling the clinical and economic consequences of these strategies in

patients with significant bleeding risk early in their post-trauma care. Events included in the model were death, bleeding, vascular occlusion, drug-related adverse events and post-injury health status. Intervention costs fluctuations were modeled from the least expensive generic drug to the most expensive therapeutic brand; other costs were assumed to be equal between strategies, potentially biasing against TXA. Probabilities mainly came from the CRASH-2 study, a large placebo controlled trial of the effects of early administration of a short course of TXA on death, vascular occlusive events, and the receipt of blood transfusion. This trial recruited 20,211 patients from 274 hospitals in 40 countries. Health state utilities were obtained from medical literature, reflecting the effect of possible adverse events due to antifibrinolytic treatment. The time horizon for the model was one year. Sensitivity analyses were performed to identify variables whose variation impacted base case model results.

Results: In the base case analysis, TXA gained 0.0381 more quality-adjusted life-years (QALYs) at an added cost of $160, or $4,199/QALY. In sensitivity analyses, TXA cost $2,205/QALY when drug costs were at the lower limit ($84, base case $160) and cost $32,018/QALY at the upper limit ($1,220). Results were also sensitive to variation of adverse events risk related to TXA, with the incremental cost-effectiveness ratio increasing to $65,570/QALY when this risk was fixed at 80% (base case 5%).

Conclusions: Our results favor TXA therapy in trauma patients over no TXA. The economic benefit of TXA is substantial in an analysis biasing against its use. Based on favorable clinical trial and economic analysis data, adoption of TXA in trauma treatment protocols should be recommended. *Funded by FIC NIH grant D43 TW007560 01

H-3. COST-EFFECTIVENESS OF OMALIZUMAB FOR THE TREATMENT OF ADULTS WITH MODERATE TO SEVERE PERSISTENT ASTHMA: RESULTS FROM A RANDOMIZED CONTROLLED TRIAL IN JAPAN

10:30 AM - 10:45 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
*Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION*

***Toshitaka Morishima, MD**, Hiroshi Ikai, MD, PhD and Yuichi Imanaka, MD, PhD, Kyoto University Graduate School of Medicine, Kyoto, Japan*

Purpose: Omalizumab, a recombinant humanized monoclonal anti-IgE antibody, reduces risk of exacerbations and improves health-related quality of life (HRQoL) among patients with moderate to severe persistent asthma. Several economic evaluations of omalizumab have been reported previously. Our objective was to evaluate cost-effectiveness of omalizumab, using results of a randomized controlled trial which enrolled Asian population for the first time and was conducted in Japan.

Method: We developed a Marcov model comparing omalizumab plus standard therapy with standard therapy alone, on the basis of efficacy data from the randomized placebo-controlled double-blind trial and cost data of Japan. Our model had a lifetime horizon in which five-year omalizumab plus standard therapy was followed by standard therapy alone. The study cohort matched the clinical trial population with an average age of 50 and 50% men. Omalizumab provides different benefits for patients with persistent asthma, although no predictive factor for response has been found. Non-responders who represented little effect of omalizumab reverted back to standard therapy after 16-week omalizumab therapy. We assumed that patients could transition every week among symptom-free state, day-to-day state, and exacerbation state, and that patients in asthma-related hospitalization state were at risk of dying from asthma exacerbation. We derived preference-based utility values from another study examining relationship between asthma control level and HRQoL

because the clinical trial in Japan failed to measure HRQoL convertible into utilities. Costs from a societal perspective included estimates for drugs, medical resource uses, and lost productivity.

Result: The mean lifetime discounted costs and quality-adjusted life years (QALYs) were $118,000 and 16.097 for omalizumab plus standard therapy, and $47,000 and 16.003 for standard therapy alone. The incremental cost-effectiveness ratio (ICER) was $751,000/QALY. One-way sensitivity analyses indicated that the results were sensitive to asthma-related mortality, exacerbation rates, symptom-free rates, and omalizumab price.

Conclusion: The result of the base case analysis suggested that omalizumab was not cost-effective given a willingness to pay of $54,000 in Japan. However, omalizumab possesses a unique mechanism and is required for the treatment of persistent asthma. The cost-effectiveness of omalizumab would be improved if the price of omalizumab is cut down and omalizumab therapy is confined to patients with higher asthma mortality or exacerbation risk.

H-4. COST-EFFECTIVENESS OF SCREENING STRATEGIES FOR PEDIATRIC DYSGLYCEMIA

10:45 AM - 11:00 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

Joyce Lee, MD, MPH and *Achamyeleh Gebremariam, MS, University of Michigan, Ann Arbor, MI*

Purpose: To evaluate the effectiveness and cost-effectiveness of four screening strategies for identifying overweight and obese adolescents with dysglycemia (prediabetes or diabetes) from a single-payer and societal perspective.

Method: We assumed that 2.5 million US children qualify for screening, with a 15% prevalence of dysglycemia(n=375,000 children). Test performance was based on a clinical study of nonfasting test performance. We calculated direct costs (testing costs) using Medicare reimbursement rates, and indirect costs (patient time costs) using data from the Bureau of Labor Statistics. Costs were expressed in $US2010. The 4 strategies considered included: (1)2-hour oral glucose tolerance test (2-hr OGTT)(positive greater than or equal to 140 mg/dl) only, or nonfasting initial screening tests [(2)HbA1c greater than or equal to 5.7%); (3)random glucose(positive greater than or equal to 100 mg/dl); or (4)1-hour glucose tolerance test(1-hr OGTT) (positive greater than or equal to 110 mg/dl)], followed by a 2-hr OGTT only if the initial test is positive. Outcomes included the proportion of cases identified, total screening costs, and cost per case identified. We also conducted sensitivity analyses assuming a 50% lower adherence for the 2-hr OGTT only strategy, and increases or decreases in the prevalence of dysglycemia(±25%).

Result: Compared with the other strategies, HbA1c was associated with a lower number of true positives, a higher number of missed cases, and higher total costs and a higher cost per case detected (direct and direct combined with indirect). This is highlighted in the figure which shows the "efficiency frontier", plotting effectiveness (% of cases of dysglycemia missed) against efficiency (cost per case). An ideal test is located near the origin. Although the 2-hr OGTT only strategy had high effectiveness and a lower cost per case identified, when we assumed only 50% adherence, screening effectiveness dropped to 50% with lower overall costs, but the same cost per case identified. At higher and lower estimates of prevalence, test effectiveness and overall costs did not change, but the cost per case increased or decreased by 25%.

Conclusion: HbA1c was an inferior test compared with the other test strategies. 1-hr OGTT and random glucose were intermediate regarding efficiency and effectiveness, and therefore may be viable strategies for dysglycemia screening in adolescents.
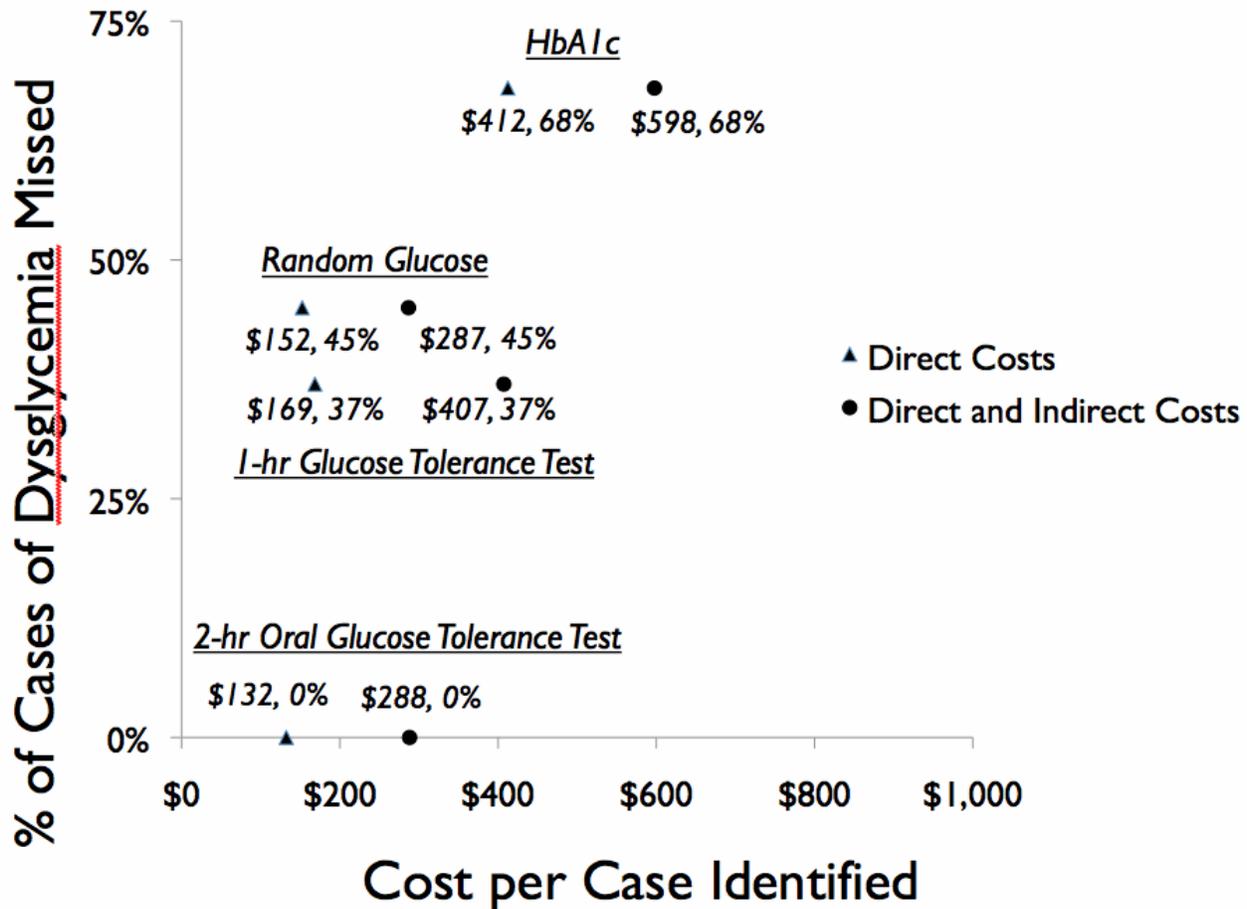
H-5. A PORTFOLIO APPROACH TO HIV CONTROL IN SOUTH AFRICA

11:00 AM - 11:15 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

***Elisa F. Long, PhD**, Yale University, New Haven, CT and Robert R. Stavert, MD, MBA, Yale School of Medicine, New Haven, CT*

Purpose: With more than 400,000 annual new HIV infections in South Africa, scaling up prevention is an urgent priority. Many experts believe a portfolio of interventions is the best strategy for controlling the epidemic. We aimed to evaluate the cost-effectiveness of HIV intervention portfolios in South Africa, to maximize health benefits given limited resources.

Methods: We developed a dynamic HIV transmission model to evaluate combinations of HIV screening, antiretroviral therapy (2010 guidelines), male circumcision, vaccination, and vaginal microbicide use. The model includes disease transmission, progression, morbidity, and mortality among adults aged 15-49 in South Africa. Initial conditions were based on demographic, epidemiologic, and behavioral data, and

parameters were adjusted using trial data on intervention efficacy. Three trials in sub-Saharan Africa indicated that male circumcision reduced transmission in heterosexual men by 48-60%; a 2009 Thailand trial found a vaccine regimen conferring 31% protection; a 2010 South Africa vaginal tenofovir microbicide trial indicated a 39% transmission reduction in women. Calculated outcomes include incidence, prevalence, quality-adjusted life years (QALYs), and cost-effectiveness. We extended our deterministic results to include a Monte Carlo simulation and probabilistic cost-effectiveness analysis to account for uncertainty in each intervention's efficacy.

Results: Under the status quo, 1.43 million (men) and 1.64 million (women) new infections occur over 10 years. Increased male circumcision is cost-saving, reducing infections by 19% (men) and 7% (women). Broad use of a vaginal microbicide reduces incidence by 30% (women) and 11% (men) due to reduced secondary transmission, for $750/QALY assuming an annual microbicide cost of $100. Extensive vaccination reduces cases by 26%, for $880/QALY assuming $500 per vaccination series. A program offering circumcision, microbicides, and vaccination has diminishing returns, preventing 43% of cases. Alternatively, increased screening and antiretroviral therapy reduces incidence by 45%, for $800/QALY. A portfolio with all five interventions averts 69% of infections, and is cost-effective at $1,860/QALY. Monte Carlo simulation results suggest that such a strategy costs <$5,000/QALY in 87% of trials, and <$10,000/QALY in 94% of trials.

Conclusions: A comprehensive portfolio of expanded HIV screening, antiretroviral therapy, male circumcision, vaccination, and microbicide use prevents the greatest number of infections and is cost-effective. Male circumcision is cost-saving, but differentially benefits men. Given resource constraints, the model can help identify the optimal portfolio of interventions.
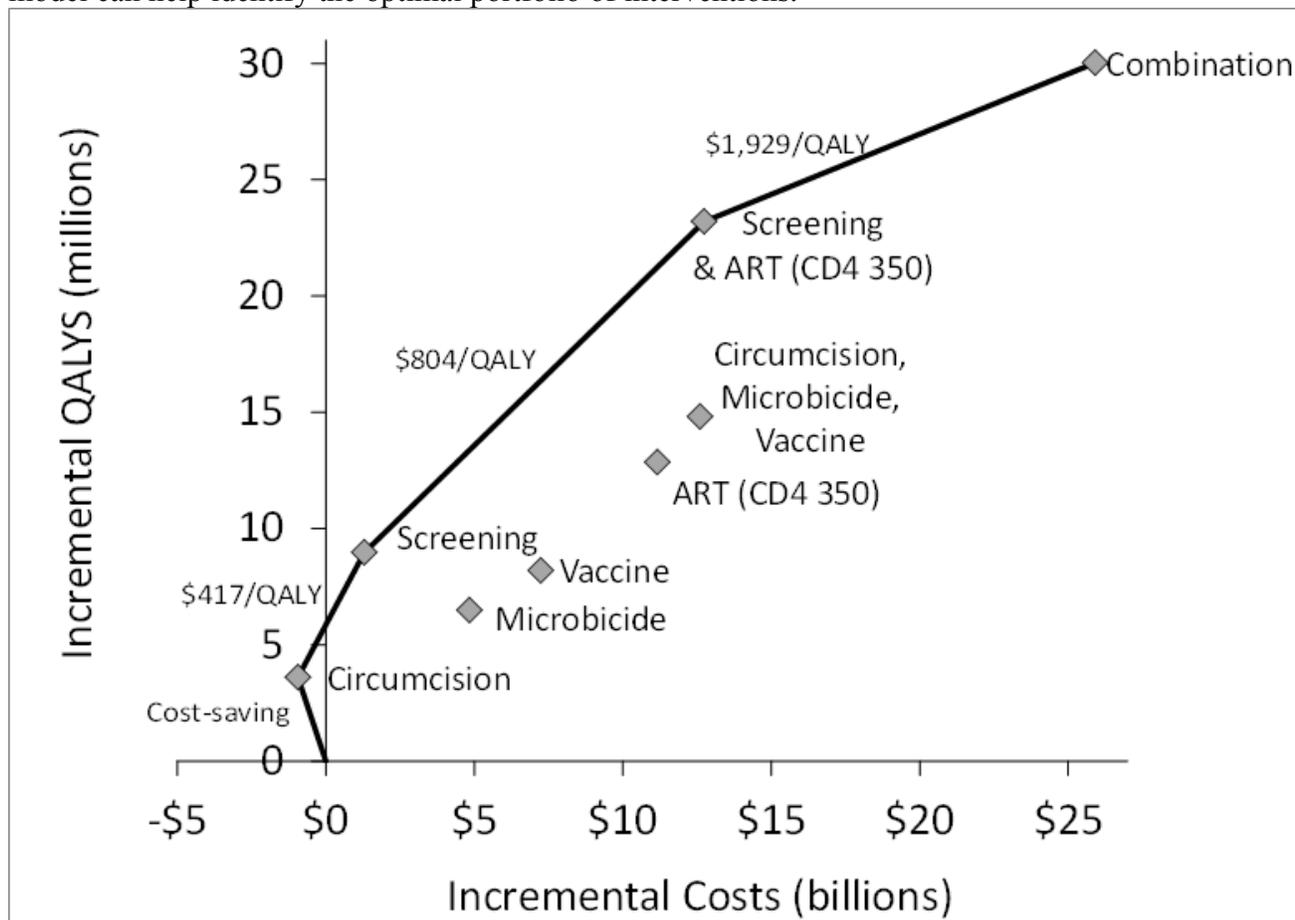
H-6. USE OF DEDICATED WINGS TO MAXIMIZE INSTITUTIONAL OBJECTIVES UNDER STRAINED BED CAPACITY

11:15 AM - 11:30 AM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: COST-EFFECTIVENESS ANALYSIS AND ECONOMIC EVALUATION

Thomas J. Best, MSc, *Burhaneddin Sandikci, PhD, David O. Meltzer, MD, PhD and Donald D. Eisenstein, PhD, The University of Chicago, Chicago, IL*

Purpose: Many teaching hospitals with strained inpatient bed capacity struggle to maintain a mix of patients that satisfies their teaching, research, and financial needs. Even an increase in bed capacity is unlikely to address the patient mix problem. We investigate one such hospital that received special dispensation from the government to partition its inpatient beds into wings. Each wing is allocated a fixed number of beds and is restricted to a fixed set of clinical specialties. An admission request is granted only if a bed is available in the appropriate wing. We develop a modeling framework to investigate how best to form wings so as to optimize some function of patient mix.

Method: A dynamic programming (DP) model is formulated to optimize the wing configurations from the perspective of the hospital administrator. The model assumes a heterogeneous patient population that demands hospital services in a stochastic manner. The model maximizes the average DRG (Diagnosis Related Grouping) relative weights of admitted patients. Parameters are calibrated with data from the hospital and from national databases. In addition, we model length-of-stays as decreasing when a wing becomes more heavily demanded. This model of length-of-stays is supported with empirical evidence. The associated DP is too large to solve using standard methods. However, we are able to exploit special structures of the model that enables us to obtain near optimal solutions very quickly.

Result: If the total demand for hospital beds per day is, on average, sufficiently less than bed capacity, then the optimal solution is to avoid forming specialized wings. As average total demand for beds increases it becomes more advantageous to form multiple wings. In particular, our model shows that forming wings when the hospital services are heavily demanded will increase the average DRG relative weight, decrease the average overall occupancy, yet increase the number of patients admitted. The increase in patient flow is due to a decrease in length-of-stays for highly utilized wings.

Conclusion: Forming wings can be an effective strategy to deal with strained bed capacity. Our dynamic programming model informs hospital administrators about how to form wings that achieve a patient mix that better matches the mission of the hospital. The solutions are fast to obtain and easy to communicate.

I. INNOVATIVE METHODS LUSTED FINALISTS

10:00 AM - 11:30 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Session Chairs:

- *Jeremy D. Goldhaber-Fiebert, PhD*
- *A. David Paltiel, PhD*

10:00 AM - 10:15 AM

I-1. APPLYING DOUBLY ROBUST METHODS IN THE CONTEXT OF COST-EFFECTIVENESS ANALYSIS

10:15 AM - 10:30 AM

I-2. DECISIONS, DECISIONS: CAN DIRECT-SEARCH OPTIMIZATION OF CONTINUOUS DECISION VARIABLES RESULT IN SUBSTANTIAL WELFARE GAINS COMPARED TO USUAL METHODS?

10:30 AM - 10:45 AM

I-3. APPLYING THE PAYOFF TIME FRAMEWORK TO CAROTID DISEASE MANAGEMENT

10:45 AM - 11:00 AM

I-4. EVALUATING THE ROLE OF ASPIRIN FOR CARDIOVASCULAR RISK MANAGEMENT FOR PATIENTS WITH TYPE 2 DIABETES

11:00 AM - 11:15 AM

I-5. USING AGENT-BASED SIMULATION TO EVALUATE POLICIES FOR CLOSTRIDIUM DIFFICILE INFECTION CONTROL IN A HOSPITAL

11:15 AM - 11:30 AM

I-6. EXPECTED UTILITY MODEL USED TO COMPARE THE VALUE OF SCREENING VERSUS DIAGNOSTIC MAMMOGRAPHY

Abstracts:

I-1. APPLYING DOUBLY ROBUST METHODS IN THE CONTEXT OF COST-EFFECTIVENESS ANALYSIS

10:00 AM - 10:15 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

Noemi Kreif[1], Richard Grieve, PhD[1], Rosalba Radice, PhD[1], Susan Gruber[2] and Jasjeet S. Sekhon, PhD[2], (1)London School of Hygiene and Tropical Medicine, London, United Kingdom, (2)UC-Berkeley, Berkeley, CA

Purpose: For cost-effectiveness analyses (CEA) that use observational data the key methodological challenge is to minimize selection bias. Propensity score (Pscore) methods can reduce selection bias due to observable differences between treatment groups; but the true Pscore model is generally unknown. Doubly robust (DR) methods exploit information in the Pscore and the response models, and provide unbiased estimates if either model is correctly specified. These methods hold promise for CEA, where selection bias needs to be minimized for the cost as well as the effectiveness endpoint. DR methods have not been examined before in this context.

Method: One implementation of DR methods is inverse probability of treatment weighting (AIPTW). The simple IPTW estimator weights observed cost and effectiveness endpoints with the inverse of the Pscore, to estimate incremental costs and effectiveness. AIPTW extends this by adjusting the formula with weighted predictions from the regression models of the respective endpoints. If a response model is correctly specified, adding this term can reduce bias. The adjustment also stabilises extreme Pscore weights, which can improve the precision of the IPTW estimator.

   To compare the methods in a CEA, we evaluate Drotrecogin alfa activated (DrotAA), a pharmaceutical intervention for critically ill patients with severe sepsis. We use data from a published observational study (n=1,898). Potential confounders were selected a priori (e.g. age, APACHE II severity score). Higher order terms and interaction terms were considered, and regression models for both cost and effectiveness were selected by cross-validation. A two-part model was chosen for the QALY and a generalized linear model with gamma distribution for the costs. To maintain correlation between costs and effects, confidence intervals (CI) were constructed by nonparametric bootstrapping.

Result: The incremental net benefit (INB) (λ=£20,000 per QALY) for DrotAA following IPTW was -£4796 (95% CI: - 23927 to 14969). After applying AIPTW, the estimated INB was £4936. Stabilizing the extreme Pscore weights led to tighter CI (-3867 to 12229).

Conclusion: DR methods avoid relying solely on a correctly specified Pscore or response model, and can lead to different point estimates and narrower CI than IPTW. Recent work shows that DR methods, eg. collaborative targeted maximum likelihood, can minimize bias and be efficient even if neither the Pscore or response models are correct, offering further flexibility in CEA.

I-2. DECISIONS, DECISIONS: CAN DIRECT-SEARCH OPTIMIZATION OF CONTINUOUS DECISION VARIABLES RESULT IN SUBSTANTIAL WELFARE GAINS COMPARED TO USUAL METHODS?

10:15 AM - 10:30 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

Ankur Pandya, MPH, Harvard University, Boston, MA, Thomas Gaziano, MD, MSc, Harvard Medical School, Boston, MA and Milton C. Weinstein, PhD, Harvard School of Public Health, Boston, MA

Purpose: In cost-effectiveness analyses (CEAs) involving continuous decision variables (such as screening rates or treatment thresholds), the strategies being evaluated are generally pre-specified using arbitrary thresholds or round numbers. The objective of this study was to evaluate the potential gains in welfare,

defined by average net monetary benefit (NMB), from direct-search optimization of continuous decision variables (cardiovascular disease [CVD] screening/treatment thresholds) compared to solely focusing on pre-specified strategies.

Method: We used a CVD micro-simulation model to estimate the lifetime health benefits (quality-adjusted life years [QALYs]) and screening, treatment, and event costs under various multi-staged screening/treatment strategies for a representative cohort of 10,000 adults (aged 25-74 years) in the U.S. without history of CVD. Screening/treatment strategies were defined by the numbers of individuals receiving non-laboratory-based or cholesterol-based risk assessment, and by the proportions of individuals ultimately receiving lipid-lowering and/or blood pressure treatment. In total, 36 age- and sex-specific continuous decision variables collectively defined any screening/treatment strategy. Fifty pre-specified strategies were determined based on commonly-used treatment thresholds and/or plausible screening/treatment cutoffs that spanned a considerable range of the decision variable space. These strategies were compared to an optimized set of decision variables that was determined using the Nelder-Mead algorithm, a direct-search method that aimed to maximize average NMB (discounted at 3%, using a willingness-to-pay [WTP] value of $100,000/QALY). Common random numbers were employed to produce stable results across model runs.

Result: Among the pre-specified strategies, the optimal option under conventional incremental CEA rules yielded discounted per-person averages of 20.422 QALYs, costs of $12,734, and average NMB of $2.0295 million. The corresponding results from the direct-search optimization were 20.419 QALYs, costs of $11,456, and average NMB of $2.0305 million. Extrapolated to the relevant U.S. population eligible for primary CVD prevention (~136 million adults), the total difference in average NMB between these approaches would be >$130 billion.

Conclusion: We found that direct-search optimization of multistage CVD screening/treatment thresholds resulted in meaningful gains in welfare (average NMB) compared to a traditional CEA of pre-specified strategies. Future CEA studies involving many (>10) continuous decision variables might also benefit from employing direct-search or other optimization algorithms, although the gains in NMB should be weighed against potential losses from increased complexity of model results and subsequent clinical guidance (i.e., nuanced screening/treatment guidelines).

I-3. APPLYING THE PAYOFF TIME FRAMEWORK TO CAROTID DISEASE MANAGEMENT

10:30 AM - 10:45 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

Theodore H. Yuo, MD[1], *R. Scott Braithwaite, MD, MSc, FACP[2], Chung-Chou H. Chang, PhD[3], Kevin L. Kraemer, MD, MSc[3] and Mark S. Roberts, MD, MPP[4], (1)RAND-University of Pittsburgh Health Institute, Pittsburgh, PA, (2)New York University School of Medicine, New York, NY, (3)University of Pittsburgh School of Medicine, Pittsburgh, PA, (4)University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA*

Purpose: Asymptomatic carotid artery stenosis is associated with stroke, and while surgery to correct stenosis can reduce stroke risk, surgery can sometimes cause stroke immediately, leading to a net loss of benefit, especially in patient populations with a high baseline mortality rate. We model the relationship between immediate risk, long term benefit, and life expectancy in order to generate a simple, clinically relevant formula that can aid decisions about carotid surgery.

Method: We use the recently articulated concept of the "payoff time" to compare initial risks of surgery with subsequent benefits. Quality-adjusted life-years (QALYs) lost initially due to surgery are an "investment" that is recouped over time. If the patient cohort has a short life expectancy, this investment is not recovered. We sought simple closed-forms that defined the relationship between perioperative stroke risk (P), annual rate of stroke without surgery (r_0), annual rate of stroke after surgery conditional on not having had a perioperative stroke (r_1), utility levels assigned to the baseline state (u_b) and the stroked state (u_s), and life expectancy ($1/\lambda$), assuming the declining exponential approximation of life expectancy (DEALE). Numeric models, using parameters from the published literature, were constructed to verify mathematical solutions.

Result: In order for there to be a finite payoff time for carotid surgery to correct an asymptomatic stenosis, there is a minimum critical life expectancy (MCLE=$1/\lambda^*$), given by the following equation: $1/\lambda^* = P/(r_0-r_1)$. This relationship is independent of the utilities assigned to the health states, if a simple rank ordering exists where $u_b > u_s$. For clinically relevant values in asymptomatic patients (P=3%, r_0=1%, r_1=0.5%), the MCLE is 6 years, which is longer than published guidelines regarding patient selection for this intervention. Figure 1 demonstrates that for a representative $1/\lambda$>MCLE, total cumulative QALYs associated with surgery, as compared to non-operative management, are greater than zero, but for a representative $1/\lambda$<MCLE, total cumulative QALYs are negative.
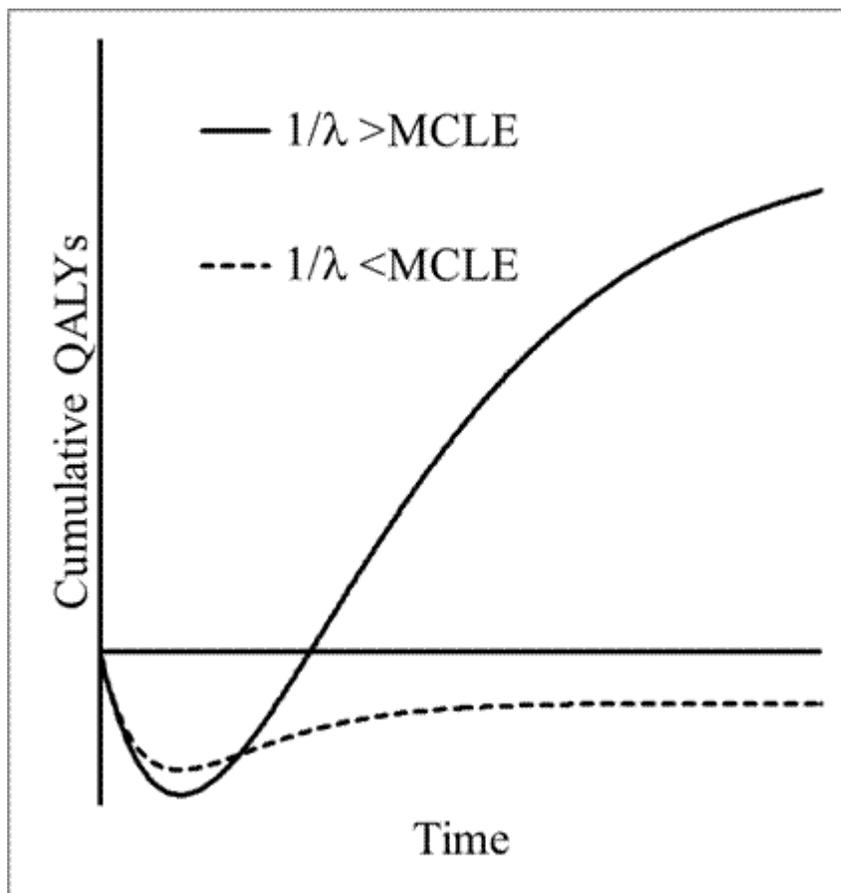
\s *Figure 1*

Conclusion: For patients with asymptomatic carotid disease, the payoff time framework specifies a MCLE=$1/\lambda^*$=$P/(r_0-r_1)$ as the life expectancy threshold that determines if there is any benefit from surgery.

The MCLE is approximately 6 years, suggesting that many clinically relevant populations with asymptomatic carotid disease and short life expectancy do not benefit from surgery because they suffer too much perioperative harm compared to the benefit they receive.

I-4. EVALUATING THE ROLE OF ASPIRIN FOR CARDIOVASCULAR RISK MANAGEMENT FOR PATIENTS WITH TYPE 2 DIABETES

10:45 AM - 11:00 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

Jennifer E. Mason, MS[1], Yuanhui Zhang[1], Brian T. Denton, PhD[1], Nilay D. Shah, PhD[2] and Steven Smith, MD[3], (1)North Carolina State University, Raleigh, NC, (2)Mayo Clinic, Rochester, MN, (3)Mayo Clinic College of Medicine, Rochester, MN

Purpose: To evaluate the role of aspirin together with the combined management of hyperlipidemia and hypertension in patients with type 2 diabetes.

Method: We present a Markov decision process model to determine the optimal start times for the combination of aspirin and the most common cholesterol and blood pressure medications for patients with type 2 diabetes. Health states were defined by cholesterol, blood pressure, A1c, and other risk factors used by the United Kingdom Prospective Diabetes Study risk model. Transition probabilities and treatment effects were estimated from a longitudinal clinical dataset from the Mayo Clinic electronic medical record. Cost parameters and disutilities were taken from secondary sources. The objective of the model was to maximize expected rewards over the course of the patient's lifetime. Rewards were defined by the difference in benefits of increased quality-adjusted life years (QALYs) to first event (including stroke, CHD, gastrointestinal bleed, and death from all causes) based on a societal willingness-to-pay factor, minus costs of medication. One-way sensitivity analysis was performed for the risk reduction factors for stroke and CHD, and the probability of gastrointestinal bleed.

Result: We computed the optimal treatment guidelines assuming availability of aspirin, statins, fibrates, ACE Inhibitors, Thiazides, and Beta-Blockers. For the base case the average incremental effect of adding aspirin is an increase of 0.736 QALYS and a decrease of $291 for males, and an increase of 0.434 QALYs and a decrease of $675 for females. Depending on individual CHD and stroke risk, females should initiate aspirin between the ages of 40 and 48; males should initiate aspirin at age 40, regardless of risk. Relative to the baseline, varying risk reduction for stroke from 0.85 to 1.06 resulted in a change in QALYs from 0.212 to -0.228. Varying risk reduction for CHD from 0.75 to 0.90 resulted in a change in QALYs from 0.215 to -0.230. Varying annual probability of gastrointestinal bleed from 0.0002 to 0.0005 resulted in a change in QALYs from 0.057 to -0.104. Across all cases the latest start times for males and females are 45 and 54 respectively.

Conclusion: Aspirin is beneficial for all patients with type 2 diabetes. The optimal time for initiation depends on the patient's individual risk level and assumptions about aspirin effectiveness and risk of gastrointestinal bleeding.

I-5. USING AGENT-BASED SIMULATION TO EVALUATE POLICIES FOR CLOSTRIDIUM DIFFICILE INFECTION CONTROL IN A HOSPITAL

11:00 AM - 11:15 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

James V. Codella, MEng, University of Wisconsin Madison, Madison, WI, Nasia Safdar, MD, University of Wisconsin School of Medicine and Public Health, Madison, WI and Oguzhan Alagoz, PhD, University of Wisconsin-Madison, Madison, WI

Purpose: *Clostridium difficile* infection (CDI) affects 500,000 Americans every year, and is responsible for nearly 20,000 deaths annually. Although there are guidelines to control CDI outbreaks in a hospital, there is a strong need to develop rigorous methods to assess the efficacy of these strategies. The purpose of this study is to evaluate the performance of strategies to mitigate disease spread in a hospital.

Method: We propose an agent-based simulation to model the effects of infection control strategies to minimize disease transmission rates, CDI-related mortality, and exposure. Agent-based simulation is ideal for studying the interaction between patients that results in disease transmission, because it tracks the behavior of patients, health-care staff, and visitors in the hospital. Patients arrive to the hospital, stay for a random duration, and then leave the system. During their stay, patients may develop CDI or contract CDI from other infected or exposed individuals in the hospital. We analyze the efficacy of various infection control strategies including prophylactic vancomycin treatment, patient isolation, routine bleach disinfection of rooms, and increased hand hygiene measures, and how these strategies affect outcomes such as infection rates and length of stay (LOS). We use data from admissions records from the Wisconsin Hospital Association, which include data from hospitals in the state of Wisconsin from January 2007 to June 2010, covering over two million hospital admissions.

Result: Comparing individual strategies to the base case (no strategy), our preliminary results are as follows: Vancomycin treatment leads to a 12.9% reduction in average LOS over all patients, 8.9% less CDI cases, and 5.5% fewer relapse CDI. Infected patient isolation leads to a 14.3% reduction in LOS, 4% fewer CDI cases, and 29.1% fewer relapse CDI. Routine bleach disinfection leads to a 16.6% reduction in LOS, 6.3% fewer CDI cases, and 31% fewer relapse CDI. Increased hand hygiene leads to a 6.1% reduction in LOS, 5% fewer CDI cases, and 10.9% fewer relapse CDI. Finally, a comprehensive strategy leads to 59.7% reduction in average LOS, a 25.2% reduction in new CDI, and a 74.1% reduction in relapse CDI.

Conclusion: Our agent-based model provides a rigorous analytical method for evaluating the efficacy of a customized strategy for combating CDI outbreaks in a hospital, thus leading to shorter LOS, fewer infections, and fewer relapses.

I-6. EXPECTED UTILITY MODEL USED TO COMPARE THE VALUE OF SCREENING VERSUS DIAGNOSTIC MAMMOGRAPHY

11:15 AM - 11:30 AM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: INNOVATIVE METHODS LUSTED FINALISTS

Yirong Wu, PhD[1], David J. Vanness, Ph.D.[2], Mehmet Ayvaci, MS[1], Oguzhan Alagoz, PhD[1] and Elizabeth S. Burnside, MD, MPH, MS[1], (1)University of Wisconsin-Madison, Madison, WI, (2)Department of Population Health Sciences, Madison, WI

Purpose: To develop a maximum expected utility (MEU) model for assessing the value of diagnostic tests, and use this model to evaluate screening versus diagnostic mammography.

Method: We collected the records of 2,378 consecutive patients who underwent screening and follow-up diagnostic mammographic examinations from 2005-2008, which contained demographic risk factors and mammographic findings. Based on these features, we used a Bayesian network (BN) to estimate the risk of

malignancy, constructed a receiver operating characteristic (ROC) curve using the BN estimated probabilities, and determined the optimal operating point at which expected utility was maximized. We first trained and tested two BNs (one screening and one diagnostic) using the tree augmented naïve Bayes (TAN) algorithm and 10-fold cross-validation. We generated ROC curves and calculated area under each ROC curve (AUC). Then, we assigned utility values for each category of findings (True Negative (TN), False Positive (FP), False Negative (FN) and True Positive (TP)) as follows. TN findings were chosen as our baseline and assigned a utility of zero. Based on the literature, the utility of FP was assigned a loss of ten days due to physical discomfort and anxiety. We used the previously developed and validated University of Wisconsin Breast Cancer Simulation (UWBCS) model to estimate the utility of FN as a loss of 2.52 years. We assumed the utility of TP was $U(FN) \times (1-\alpha)$, $0 \leq \alpha \leq 1$, where α is an unknown parameter representing the overall effectiveness of breast cancer treatment. Finally, we found MEU at the optimal operating point on the ROC curve that intersected the line with slope $[(U(TN)-U(FP))/(U(TP)-U(FN))] \times [(1-p)/p]$, where p is prevalence of breast cancer.

Result: Diagnostic mammography was overall more accurate than screening mammography (AUC: 0.936 *vs*. 0.773, *p*<0.001). The MEU of both diagnostic and screening mammography increased as α increased. MEU of diagnostic mammography exceeded that of screening mammography for all values of α, with the difference approximately equal to 0.012 when $\alpha \geq 0.5$.

Conclusion: Diagnostic mammography has higher accuracy and MEU when compared to screening mammography. Our analysis indicates that MEU methods can provide a framework to assess the value of diagnostic tests in other clinical areas, making use of the relative consequences of correct and incorrect diagnosis.

BD4. INVITED SESSION: TBD 4

1:00 PM - 2:30 PM: Tue. Oct 25, 2011
Columbus Hall AB (Hyatt Regency Chicago)

J. RISK COMMUNICATION AND RISK PERCEPTION

1:00 PM - 2:30 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Christine M. Duffy, MD, MPH*
- *William Dale, MD, PhD*

Session Summary:

1:00 PM - 1:15 PM

J-1. THE EFFECT OF NARRATIVE CONTENT AND EMOTIONAL VALENCE ON DECISIONS ABOUT TREATMENTS FOR EARLY STAGE BREAST CANCER

1:15 PM - 1:30 PM

J-2. AVATARS AND ANIMATION OF RANDOMNESS IN RISK GRAPHICS HELP PEOPLE BETTER UNDERSTAND THEIR RISK OF CARDIOVASCULAR DISEASE

1:30 PM - 1:45 PM

J-3. LITERACY AND IRRATIONAL DECISIONS: BIAS FROM BELIEFS, NOT FROM COMPREHENSION

1:45 PM - 2:00 PM

J-4. DISGUSTING MEDICAL OUTCOMES FEEL MORE LIKELY THAN THEY REALLY ARE

2:00 PM - 2:15 PM

J-5. INTEGERS ARE BETTER: ADDING DECIMALS TO RISK ESTIMATES MAKES THEM LESS BELIEVABLE AND HARDER TO REMEMBER

2:15 PM - 2:30 PM

J-6. FEASIBILITY OF A WEB-BASED TREATMENT DECISION TOOL FOR OLDER PATIENTS WITH DIABETES

Abstracts:

J-1. THE EFFECT OF NARRATIVE CONTENT AND EMOTIONAL VALENCE ON DECISIONS ABOUT TREATMENTS FOR EARLY STAGE BREAST CANCER

1:00 PM - 1:15 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: RISK COMMUNICATION AND RISK PERCEPTION

Victoria A. Shaffer, PhD, *University of Missouri-Columbia, Columbia, MO, Lukas Hulsey, BS, Wichita State University, Wichita, KS and Brian J. Zikmund-Fisher, PhD, University of Michigan, Ann Arbor, MI*

Purpose: To examine the effect of narrative content and emotional valence on decisions about treatments for early stage breast cancer.

Method: 263 women were asked to imagine they had been diagnosed with early stage breast cancer, needed to choose between two surgical treatments (lumpectomy with radiation versus mastectomy), and were provided with one of five computer-administered sets of information about these two surgeries. In the control condition, participants viewed a table containing descriptions of the surgeries, the length of recovery time, need for radiation, and other decision relevant facts. In the four remaining conditions, participants viewed the

same table plus four videotaped narratives, which varied in structure by a 2 (narrative content: process or experience) x 2 (emotional valence: positive or mixed) factorial design. Process narratives discussed the factors a woman considered when making her surgical decision, whereas experience narratives described what it was like to go through the surgery itself. Two narrative conditions used only positive narratives while the other two contained equal numbers of positive and negative narratives. After reviewing all materials, participants were asked to make a hypothetical treatment decision and complete several measures of reactions to the narratives and confidence in the decision process. Participants also completed the Subjective Numeracy Scale, the Need for Cognition scale, the Decision Quality Index and the Decision Conflict Scale.

Result: Providing narratives to participants had no effect on treatment decisions; approximately two-thirds of participants in all groups preferred lumpectomy and radiation. However, participants in the narrative conditions reported somewhat less uncertainty than participants in the control condition, $F(1, 261) = 3.66$, $p = .057$. Experience narratives were better than process narratives at increasing decisional confidence, feelings of preparedness, and the ability to imagine what it would be like to have a lumpectomy $Fs(1, 205) > 4.65$, $ps < .05$. The mix of positive and negative narratives was perceived to be more emotional, $t(206) = -2.78$, $p = .006$, and produced a greater connection to the breast cancer survivors, $t(206) = -1.96$, $p = .05$, than positive narratives alone.

Conclusion: While providing narratives did not change participants' treatment intentions, narratives appeared to lower decisional uncertainty, and a mixture of positive and negative experience narratives may be most helpful to decision makers.

J-2. AVATARS AND ANIMATION OF RANDOMNESS IN RISK GRAPHICS HELP PEOPLE BETTER UNDERSTAND THEIR RISK OF CARDIOVASCULAR DISEASE

1:15 PM - 1:30 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: RISK COMMUNICATION AND RISK PERCEPTION

Holly O. Witteman, PhD[1], Andrea Fuhrel-Forbis[1], Mark Dickson, MA[1], Harindra C. Wijeysundera, MD[2] and Brian J. Zikmund-Fisher, PhD[1], (1)University of Michigan, Ann Arbor, MI, (2)Schulich Heart Center, Sunnybrook Health Sciences Center, Toronto, ON, Canada

Purpose: To test whether using 1) an avatar (a figure representing an individual) and 2) animations of randomness in a pictograph help people better understand a personal health risk by explicitly showing 1) how population-based statistics apply to individuals and 2) the random element of risk estimates.

Methods: 3676 adults in a demographically diverse US-based online sample (mean age 53, 55% female, 78% white, 54% no college degree) with no history of cardiovascular disease entered their personal health information in a validated model that calculates 10-year risk of general cardiovascular disease (CVD risk). The median 10-year risk of CVD within this population was 8% (interquartile range 11%). Risk levels were classified as low if <5% (24% of participants), moderate if 5-9% (32%) and high if 10% or higher (45%). Participants were randomized to different versions of an animated pictograph showing their CVD risk. Pictographs either included an avatar or not, and were either standard versions that grouped all event rectangles together or versions that first displayed event rectangles randomly distributed in the pictograph before transitioning to a standard version. Participants answered a brief set of questions about their risk perceptions (how large or small the risk feels and how likely do they think they are to have CVD in the next ten years) and their behavioral intentions in the next 30 days. At the conclusion of the survey, participants were asked to recall their risk estimate.

Results: Using an avatar in the graphic increased perceptions of CVD likelihood for those at moderate and high risk ($F_{(1,2792)}=8.45$, $p=.004$), but not for those at low risk. Using animated randomness made lower risks feel smaller and less likely, and higher risks feel larger ($F_{(2,3623)}=3.40$, $p=.03$) and more likely ($F_{(2,3669)}=4.28$, $p=.01$). Both avatars ($F_{(2,3648)}=6.03$, $p=.002$) and animated randomness ($F_{(2,3648)}=3.95$, $p=.02$) resulted in people at lower risk reporting lower intentions and those at higher risk reporting higher intentions to see a doctor in the next 30 days. Neither avatars nor animated randomness affected recall.

Conclusions: Using avatars and animated randomness can help convey difficult concepts in personal health risk. These types of design features are straightforward to implement in an online environment, require minimal viewing time, and suggest potential to improve the effectiveness of health risk communication methods.

J-3. LITERACY AND IRRATIONAL DECISIONS: BIAS FROM BELIEFS, NOT FROM COMPREHENSION

1:30 PM - 1:45 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: RISK COMMUNICATION AND RISK PERCEPTION

Laura Scherer, PhD[1], Peter A. Ubel, MD[2], Margaret Holmes-Rovner, PhD[3], Sara J. Knight, PhD[4], Stewart Alexander, PhD[2], Bruce Ling, MD, MPH[5], James Tulsky, MD[2] and Angela Fagerlin, PhD[6], (1)VA HSR&D and University of Michigan, Ann Arbor, MI, (2)Duke University, Durham, NC, (3)Center for Ethics, E. Lansing, MI, (4)San Francisco VA Medical Center, San Francisco, CA, (5)University of Pittsburgh, Pittsburgh, PA, (6)Internal Medicine, Ann Arbor, MI

Purpose: Experts question whether certain decision-making biases are caused by low literacy. In this study, we explore whether decision-making biases are caused by low literacy per se, or if these biases can instead be explained by larger cultural factors, which are related to both literacy and patients' medical beliefs.

Method: 574 men were recruited for a study about prostate cancer decisions. All of the men were undergoing prostate biopsies following a high PSA test. As a part of a larger questionnaire, each patient was asked to respond to a hypothetical cancer scenario. They were asked to choose between *having* surgery and accepting a 10% chance of dying from cancer, versus *not* having surgery (watchful waiting) and accepting a lower, 5% chance of dying from cancer. Past research has shown that a surprising number of people (~60%) choose the dominated surgery in this scenario. Just prior to this scenario, participants' literacy (REALM) and numeracy (Subjective Numeracy Scale) were assessed. Patients were also asked questions about their beliefs about cancer treatment. These questions specifically assessed the patients' bias toward active treatment options (e.g. "How important is it to treat cancer, whether or not it makes a difference in survival?").

Result: 65% of the patients chose the dominated surgery option. As expected, participants who choose the dominated option were significantly lower in literacy than participants who chose the more rational treatment option ($p < .01$; numeracy did not predict choice, $p > .10$). However, the relationship between literacy and choice was mediated by participants' desire for more active treatment. That is, literacy was not related to choice when controlling for participants' desire for active treatment.

Conclusion: In the present scenario, the proximate cause of irrational decision making was patients' desire for active treatment, rather than low literacy per se. Literacy predicted patients' tendency to choose the dominated option, but only because literacy was related to general attitudes about active treatment. These data suggest that attempts to improve patient comprehension will not be successful at debiasing those

patients. The fact that low literacy is related to preferences for active treatment suggests that there may be larger cultural factors at work that cause the present decision bias.

J-4. DISGUSTING MEDICAL OUTCOMES FEEL MORE LIKELY THAN THEY REALLY ARE

1:45 PM - 2:00 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
*Part of Session: RISK COMMUNICATION AND RISK PERCEPTION*

Andrea M. Angott, PhD, *Duke Univeristy, Durham, NC, Holly Witteman, PhD, University of Michigan, Ann Arbor, MI and Peter A. Ubel, MD, Duke University, Durham, NC*

Purpose: All else equal, rare outcomes should be given relatively little weight in decision making. But, when strong emotions like disgust are present, objectively unlikely outcomes may feel more likely than they really are. We examined this possibility, which could account for preference-inconsistent decisions.

Method: In two pilot studies, we asked 3428 participants to rate 24 descriptions of health states on several dimensions to determine states that were rated the same on quality-of-life but differently on how disgusting they were. The pair that best fulfilled these criteria – chronic diarrhea and severe fatigue – was used in subsequent studies. In Study 1, we asked a different group of 3094 participants, "If you had to choose, would you prefer a [x]% chance of [condition], or a [x]% chance of death?" where x = 4% or 100% for both outcomes, and the condition was chronic diarrhea or severe fatigue. If people overweigh small probabilities of disgusting events like chronic diarrhea, we would expect them to choose death over diarrhea more often at 4% probability than at 100%. Substituting a less disgusting outcome, severe fatigue, should then lead to less inconsistency across probabilities. In Study 2, we presented another group of 300 participants with two hypothetical medical treatments, one with a 4% chance of death, and the other with a 4% chance of a complication, either chronic diarrhea or severe fatigue. Participants rated how likely each possible outcome felt, how vulnerable they felt to each outcome, and estimated their own particular chance of experiencing each outcome. We examined the relationship between these ratings and participants' trait disgust sensitivity.

Result: In Study 1 (see figure), people chose death over diarrhea significantly more often at 4% than at 100% (40% vs. 28%, *chi-square*=15.89, *p*<0.01), while preferences for fatigue versus death did not change across probabilities (30% vs. 34%, *chi-square*=1.92, *p*=0.18). This difference between conditions was more pronounced among lower-numeracy participants. In Study 2, trait disgust sensitivity significantly predicted both likelihood ($r = 0.19$, $p < 0.01$) and vulnerability ($r = 0.12$, $p = 0.02$) ratings across both conditions.

Conclusion: These results support the idea that disgust, a medically-relevant emotion, exaggerates people's tendency to overweight small probabilities. This occurs independent of quality-of-life concerns, and appears more prevalent among lower-numeracy individuals.
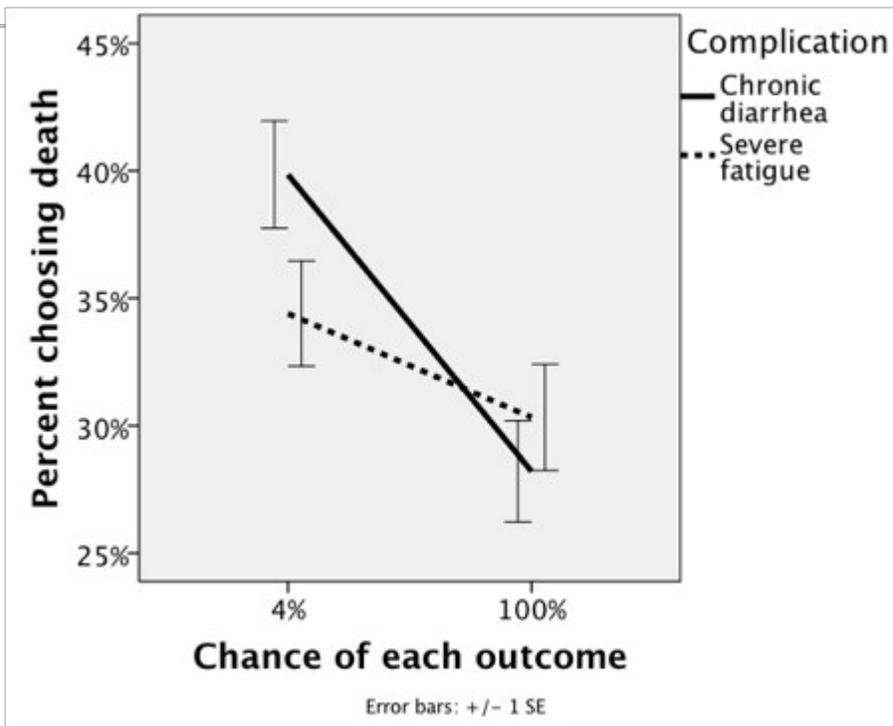
Complication
— Chronic diarrhea
···· Severe fatigue

Error bars: +/– 1 SE

J-5. INTEGERS ARE BETTER: ADDING DECIMALS TO RISK ESTIMATES MAKES THEM LESS BELIEVABLE AND HARDER TO REMEMBER

2:00 PM - 2:15 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: RISK COMMUNICATION AND RISK PERCEPTION

Holly O. Witteman, PhD[1], *Brian J. Zikmund-Fisher, PhD[1], Erika A. Waters, PhD, MPH[2], Teresa Gavaruzzi, PhD[3] and Angela Fagerlin, PhD[4], (1)University of Michigan, Ann Arbor, MI, (2)Washington University School of Medicine, Saint Louis, MO, (3)University of Leeds, Leeds, United Kingdom, (4)VA Ann Arbor Healthcare System & University of Michigan, Ann Arbor, MI*

Purpose: To determine whether the number of decimal places in a personal health risk estimate influences the extent to which people believe and remember the estimate.

Methods: 3422 adults in a demographically diverse US-based online sample (mean age 50, 52% female, 74% white, 56% no college degree) were asked to imagine they were visiting an online risk calculator hosted by a prominent university's medical school. We designed a mock calculator similar to existing calculators available online. The calculator asked a series of health questions relevant to kidney cancer and returned a hypothetical estimate of lifetime risk of kidney cancer. In this between-subjects experiment, participants were assigned one of seven risk estimates close to the average lifetime risk of kidney cancer in the US. Participants who were randomized to the no decimals condition received an estimate of 2%. Those in the one, two or three decimals conditions received an estimate of 2.1% or 1.9% (one decimal), 2.13% or 1.87% (two decimals), or 2.133% or 1.867% (three decimals). Participants were asked to indicate how believable they found the estimate to be on a six-point scale anchored by labels, "not at all," and, "extremely." Then, after completing a second, unrelated survey (median time for this task was 8 minutes), they were asked to recall to the best of their ability the kidney cancer lifetime risk estimate they had been given earlier.

Results: Risk estimates expressed as integers were judged as the most believable ($F(3, 3384)=2.94$, $p=.03$). Compared to estimates with decimal places, integer estimates were judged as highly believable (defined as the top two points of the six-point scale) by 7 to 10% more participants (Chi-squared(3)=17.82, $p<.001$). Recall was highest for integer estimates. Odds ratios for correct approximate recall (defined generously as being within 50% of the original estimate) were, for one decimal place, OR=0.65 (95% CI 0.49, 0.86), for two decimal places, OR=0.70 (95% CI 0.53, 0.94), and for three decimal places, 0.61 (95% CI 0.45, 0.81). Exact recall showed a similar pattern, with larger effects.

Conclusions: Using decimals in risk calculators offers no benefit and some cost. Rounding to the nearest integer is likely preferable for communicating risk estimates so that they might be remembered correctly and judged as believable.

J-6. FEASIBILITY OF A WEB-BASED TREATMENT DECISION TOOL FOR OLDER PATIENTS WITH DIABETES

2:15 PM - 2:30 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: RISK COMMUNICATION AND RISK PERCEPTION

Elbert S. Huang, MD, MPH[1], Aviva G. Nathan, MPH[1], Priya M. John, MPH[1], Marla Solomon, RD, LD/N, CDE[1], Milton Eder, PhD[2], Nananda F. Col, MD, MPH, MPP[3], William Dale, MD, PhD[1], David O. Meltzer, MD, PhD[1] and Marshall H. Chin, MD, MPH[1], (1)University of Chicago, Chicago, IL, (2)Access Community Health Network, Chicago, IL, (3)Maine Medical Center, Portland, ME

Purpose: We developed a web-based Geriatric Diabetes Decision Aid (GDDA) which combines a decision analytic model of DM complications with a geriatric life expectancy prediction tool. To date, little is known about the best ways to display the risk and benefits of varying levels of glycemic control to older patients with DM and their providers. We present the patients and provider acceptability testing of the GDDA.

Methods: 9 patients and 12 providers from local federally qualified health centers were interviewed utilizing qualitative methods regarding computer usage patterns, patient risk comprehension, as well as their opinions on methods of visually displaying the lifetime risk of amputation at different glycemic targets (A1c of 7, 8, and 9%). Options included a bar graph, tables, and pictograms. Patients and providers were also asked questions about the website's overall usability and design. Interviews were audio recorded and transcribed for accuracy and theme saturation. Patients and providers used the website throughout the interview.

Results: Mean patient age was 68 and 56% were female. Nine providers were male. All the providers were either in family or internal medicine. Four patients owned and used a computer regularly, three regularly used but did not own and two did not own or use computers. When tested on their knowledge of risk of amputation, only two patients failed to understand. Risk display results were different between patients and providers. Six patients preferred tables which showed the incidence of events per thousand patients. Seven providers thought patients would prefer pictograms for the different A1c targets. Patients and providers agreed that the use of color, pictures, large print, simple wording and easy to operate navigation and scroll buttons were a necessary part of the website design. All patients agreed that the GDDA is a tool that could assist in learning about A1c and discussing treatment goals with their doctor. All providers thought the GDDA could be a useful tool to stimulate conversation regarding A1c targets with their patients.

Conclusions: The GDDA is an instrument that may be able to assist patients and providers in determining individualized glycemic control targets. Pictures, simple wording, and easy navigation buttons can increase usability. Provider opinions should not be used as a proxy for patient opinions in determining the acceptability of website design.

K. HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

1:00 PM - 2:30 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *Mara Schonberg, MD, MPH*

- *Yu-Ning Wong, MD, MSCE*

Session Summary:

1:00 PM - 1:15 PM

K-1. COST-EFFECTIVENESS OF ALTERNATING MRI AND DIGITAL MAMMOGRAPHY FOR SCREENING BRCA1 AND BRCA2 GENE MUTATION CARRIERS

1:15 PM - 1:30 PM

K-2. BENEFITS AND HARMS OF MAMMOGRAPHY SCREENING AFTER AGE 74 YEARS: ESTIMATES OF OVERDIAGNOSIS

1:30 PM - 1:45 PM

K-3. COST-EFFECTIVENESS OF EPIDERMAL GROWTH FACTOR RECEPTOR GENE MUTATION TESTING FOR PATIENTS WITH ADVANCED NON-SMALL CELL LUNG CANCER LIVING IN ONTARIO, CANADA

1:45 PM - 2:00 PM

K-4. COST-EFFECTIVENESS OF A NOVEL PROSTATE CANCER DETECTION INDEX FROM A MANAGED CARE PAYER PROSPECTIVE

2:00 PM - 2:15 PM

K-5. COMPARING LIFETIME OUTCOMES FOR IMMEDIATE SURGERY VERSUS ACTIVE SURVEILLANCE FOR LOW RISK PROSTATE CANCER USING A THREE-PART MODEL

2:15 PM - 2:30 PM

K-6. QUANTITATIVE FECAL OCCULT BLOOD TESTING TO SCREEN FOR COLORECTAL CANCER: POTENTIAL ADVANTAGE OF LOWERING THE POSITIVITY THRESHOLD AND EXTENDING THE SCREENING INTERVAL

Abstracts:

K-1. COST-EFFECTIVENESS OF ALTERNATING MRI AND DIGITAL MAMMOGRAPHY FOR SCREENING BRCA1 AND BRCA2 GENE MUTATION CARRIERS

Jessica Cott Chubiz, MS[1], *Janie Lee, MD, MS[1], Michael E. Gilmore, MBA[1], Kathryn P. Lowry, BS[2], Elkan Halpern, PhD[1], Pamela McMahon, PhD[1], Paula D. Ryan, MD, PhD[3] and G. Scott Gazelle, MD, MPH, PhD[1], (1)Massachusetts General Hospital, Boston, MA, (2)Harvard Medical School/Massachusetts General Hospital, Boston, MA, (3)Fox Chase Cancer Center, Philadelphia, PA*

Purpose: To evaluate the incremental benefits and costs of adding magnetic resonance (MR) imaging to digital mammography (DM) screening in BRCA carriers.

Method: We used a Markov Monte Carlo model to compare four screening strategies to clinical surveillance (no imaging): 1) annual DM beginning at age 25 [DM25], 2) annual DM beginning at age 30 [DM30], 3) DM/MR beginning at age 25 [DM/MR25], and 4) DM/MR beginning at age 30[DM/MR30]. For combined strategies, we examined DM/MR alternating at 6-month intervals. An excess relative risk model was used to incorporate radiation risk from DM. The primary outcomes were quality adjusted life years (QALYs), lifetime costs (2010 USD) and incremental cost-effectiveness ratios (ICERs).

Result: Adding MR to DM increased QALYs and costs in both BRCA1 and BRCA2 carriers (Table 1). The DM/MR25 and DM/MR30 strategies were equally effective; DM/MR30 was less costly. Compared to DM30, DM/MR30 resulted in 0.12 and 0.06 additional QALYs at a cost of $117,754 and $114,539 in BRCA1 and BRCA2 carriers, respectively. The ICERs for DM/MR30 vs DM30 were $70,105 (BRCA1) and $209,818 (BRCA2). For BRCA1 carriers, these results were most sensitive to MRI cost, lifetime breast cancer risk, age at prophylactic oophorectomy, and MR test performance. Varying MR cost in BRCA1 carriers resulted in the widest range of ICER values. As MR cost increased to $842 (base case: $619), the ICER for DM/MR30 vs. DM30 exceeded $100,000/QALY. As MR cost decreased to $363, the ICER fell below $50,000/QALY. The results in BRCA2 carriers were stable across the range of parameters examined in sensitivity analysis.

Conclusion: Combined DM/MR screening alternating at six month intervals beginning at age 30 is considerably more cost-effective in BRCA1 carriers than in BRC2 carriers.

Table 1. Incremental cost-effectiveness of screening in BRCA1 and BRCA2 carriers.

		Clinical Surveillance	DM30	DM25	DM/MR30	DM/MR25
BRCA1	Lifetime costs	$104,490	$109,006	$110,420	$117,754	$122,557
	QALYs (y)	43.96	44.25	44.25	44.37	44.38
	ICER ($/QALY)	-	$15,294	Eliminated	**$70,105**	$480,300
BRCA2	Lifetime costs	$97,121	$102,204	$103,726	$114,539	$119,678
	QALYs (y)	45.22	45.52	45.51	45.58	45.58

ICER ($/QALY)	-	$17,078	Eliminated	**$209,818**	Eliminated

K-2. BENEFITS AND HARMS OF MAMMOGRAPHY SCREENING AFTER AGE 74 YEARS: ESTIMATES OF OVERDIAGNOSIS

1:15 PM - 1:30 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

Nicolien T. van Ravesteyn, *Eveline A.M. Heijnsdijk, PhD and Harry J. de Koning, PhD, MD, Erasmus MC, Rotterdam, Netherlands*

Purpose: Mammography screening has been found to reduce breast cancer mortality, but is also accompanied by harms, such as overdiagnosis. Overdiagnosis refers to the detection of tumors that would not have been detected in a woman's lifetime in the absence of screening. Estimates of the amount of overdiagnosis vary widely. The aim of the present study is to estimate the amount of overdiagnosis for invasive breast cancer and ductal carcinoma *in situ* associated with screening women after age 74 years.

Method: The microsimulation model MISCAN-Fadia was used to simulate a cohort of women born in 1960. All women received biennial screening starting at age 50 with varying stopping ages of screening. First, we simulated the screening currently recommended, i.e., biennial screening from age 50 to 74 years, and determined the benefits and harms of the last screen at age 74 years. Then, the additional benefits and harms of adding one screen were estimated with increasing stopping ages. We estimated the number of life years gained, quality-adjusted life years, breast cancer deaths averted, false positives and number of overdiagnosed women for each screening scenario.

Result: The model predicted that screening after age 74 years resulted in benefits in terms of breast cancer deaths averted and life years gained with no upper age limit. The number of quality-adjusted life-years gained increased for screening up to age 90 years. The number of overdiagnosed women increased steeply with increasing upper age of screening. For screening women between age 50 and 74 years 4% of the invasive breast cancers that were detected were overdiagnosed, increasing to 13% for a screen at age 80 years, and 30% for a screen at age 90 years.

Conclusion: Screening women after age 74 years results in a less favorable balance of benefits and harms than screening women between the ages of 50 and 74 years, because of the increasing amount of overdiagnosis at older ages. Decisions on the appropriate upper age depend on individual preferences. Estimates of overdiagnosis are crucial to inform women about the balance of benefits and harms of mammography screening at higher ages.

K-3. COST-EFFECTIVENESS OF EPIDERMAL GROWTH FACTOR RECEPTOR GENE MUTATION TESTING FOR PATIENTS WITH ADVANCED NON-SMALL CELL LUNG CANCER LIVING IN ONTARIO, CANADA

1:30 PM - 1:45 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

Wendong Chen, MD, PhD[1], *Peter Ellis, MD, PhD*[2] *and Murray D. Krahn, MD, MSc*[1], *(1)University of Toronto, Toronto, ON, Canada, (2)Juravinski Cancer Centre, Hamilton, ON, Canada*

Purpose: To assess the cost-effectiveness of epidermal growth factor receptor (EGFR) gene mutation testing to guide the selection of gefitinib as first-line therapy in patients with advanced non-small cell lung cancer (NSCLC) in Ontario.

Method: A decision analytic model was developed to conduct this cost-effectiveness analysis from the perspective of the Ontario Ministry of Health and Long-Term Care (MOHLTC). Under EGFR gene mutation testing strategy, tumour tissues from biopsy were assessed for EGFR gene mutation status. Patients with EGFR gene mutation would receive gefitinib as first-line therapy and conventional chemotherapy (platinum based chemotherapy and docetaxel (or pemetrexed)) before best supportive care (BSC). Patients without EGFR gene mutation would receive conventional chemotherapy and BSC. The other patients with undetermined EGFR gene mutation status would receive the same care as the patients under no testing strategy, who would receive conventional chemotherapy, erlotinib, and BSC. Literature review was conducted to estimate the epidemiology and natural history of advanced NSCLC, failure rate of EGFR gene mutation testing, and efficacy of treatments. A regression analysis on utility of patients with advanced NSCLC was applied to estimate utility variables. The estimation of cost variables was based on two Ontario cost studies for advanced NSCLC. Both benefits and costs were discounted at 5% per annum.

Result: Compared to no testing strategy, EGFR gene mutation testing strategy would need $46,021 for one additional life year or $81,071 for one additional quality adjusted life year (QALY). One-way sensitivity analysis indicated that the cost-effectiveness of EGFR gene mutation testing was highly sensitive to the efficacy and cost of gefitinib. Probabilistic sensitivity analysis suggested that the chance for EGFR gene mutation testing to be cost-effective would not be over 50% until willingness-to-pay (WTP) per QLAY increased to $93,340. Budget impact analysis predicted that the adaption of EGFR gene mutation testing would increase the annual direct medical costs by $4.6M, $7.0M, $7.9M, $8.1M, and $8.1M from 2011 to 2015 respectively on the Ontario health care system.

Conclusion: Applying EGFR gene mutation testing to guide the use of gefitinib as first-line therapy for patients with advanced NSCLC would not be considered cost-effective until WTP of MOHLTC was over $81,071 per QALY. The cost-effectiveness of EGFR gene mutation testing was highly sensitive to the efficacy and cost of gefitinib.

K-4. COST-EFFECTIVENESS OF A NOVEL PROSTATE CANCER DETECTION INDEX FROM A MANAGED CARE PAYER PROSPECTIVE

1:45 PM - 2:00 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

Michael B. Nichol, PhD[1], *Joanne Wu, MD, MS*[1], *Joice Huang, PharmD, MBA*[2], *Dwight Denham, MBA*[3], *Jin–Wen Hsu, PhD*[4], *Stanley Frencher, MD*[4], *Ronald K. Loo, MD*[4] *and Steven J. Jacobsen, MD, PhD*[4], *(1)University of Southern California, Los Angeles, CA, (2)Amgen, Thousand Oaks, CA, (3)Beckman Coulter, Inc., Brea, CA, (4)Kaiser Permanente Southern California, Pasadena, CA*

Purpose: To assess the cost-effectiveness of early prostate cancer detection with a novel prostate cancer detection index* added to serum prostate-specific antigen (PSA) compared with PSA alone test from a managed care organization perspective.

Method: The prostate cancer detection index is a mathematical formula combining Access Hybritech PSA, free PSA, and a PSA precursor form [-2]proPSA, to predict prostate cancer. It is used as an aid in distinguishing prostate cancer from benign prostatic conditions in men with a PSA test result ≥2 or ≥4 ng/mL and nonsuspicious digital rectal exam. A Markov model was constructed to estimate the expected costs and utilities of prostate cancer detection and consequent treatment under four testing strategies in men aged 50 through 75 years. The testing strategies varied in test thresholds (PSA ≥2 or ≥4 ng/mL) and methods (PSA alone vs. PSA plus the index) to recommend a prostate biopsy. The transition probabilities were from the electronic medical records analysis for male members in Kaiser Permanente Southern California (KPSC) during 1998-2007. Health state utilities and prostate cancer treatment costs were derived from the published literature. The model's cycle length was 1.5 years based on KPSC's usual practices.

Result: The most cost-effective strategy is to use PSA plus the index at PSA 2-10 ng/mL to estimate the probability of prostate cancer and recommend a biopsy, which has the lowest costs and highest effectiveness [cost/effectiveness (C/E)=13,650/12.416, $1,099/QALY]. Next is PSA plus the index at PSA 4-10 ng/mL [C/E=14,095/12.364, $1,140/QALY), followed by PSA test alone using PSA threshold ≥4 ng/mL [C/E=15,256/12.304, $1,240/QALY), and finally, PSA ≥2 ng/mL [C/E=15,789/12.287, $1,285/QALY). The strategy of PSA plus the index at PSA 2-10 ng/mL displays a 74% to 86% probability of being cost-effective at a willingness-to-pay range of 0 to $150,000/QALY gained. Variables including discount rate, starting or stopping age for PSA screening, and health utility of cancer have the most impact on the model.

Conclusion: From a managed care payer prospective, using the index as an aid to distinguish prostate cancer from benign prostatic conditions at PSA 2-10 ng/mL dominated other strategies, and was optimal in all strategies under the willingness-to-pay of $150,000/QALY. This strategy could be an important method of prostate cancer detection and improving men's health outcome. *Not currently available in the U.S.

K-5. COMPARING LIFETIME OUTCOMES FOR IMMEDIATE SURGERY VERSUS ACTIVE SURVEILLANCE FOR LOW RISK PROSTATE CANCER USING A THREE-PART MODEL

2:00 PM - 2:15 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

Steven B. Zeliadt, PhD, *VA Puget Sound Healthcare System, Seattle, WA, Ruth Etzioni, PhD, Fred Hutchinson Cancer Research Center/ University of Washington, Seattle, WA and Jing Xia, PhD, Fred Hutchinson Cancer Research Center, Seattle, WA*

Purpose: To coherently integrate multiple sources of available evidence to project lifetime outcomes for newly diagnosed men considering immediate treatment or active surveillance (AS).

Method: Lifetime estimates of time from treatment to progression (T-P) and time from progression to mortality (P-M) were estimated for the 11,347 men diagnosed in 2004-2006 in the SEER cancer registry with

low-risk disease (≤ grade 6 and ≤ stage T2a) who were treated immediately with surgery. Over 38% of all patients diagnosed during these years had low-risk disease. Outcomes under an alternative scenario of active surveillance were estimated for this cohort. Estimates for this scenario integrated a model for diagnosis to delayed treatment (D-T) including parameters for grade and PSA progression, with the same T-P and P-M models. Estimates of the potential harm of surveillance were based on advanced disease characteristics at time of delayed treatment. Large cohorts from CaPSURE, Johns Hopkins, and Mayo Clinic were used to inform the models.

Result: With immediate surgery, 26% of low-risk patients will experience biochemical failure and 1.8% will die from prostate cancer. The sampled surgery included only men who were low grade and only 37% had a PSA ≥6. The surveillance scenario resulted in 58% of patients going on to be treated, with 34% upgraded at time of treatment and 59% having a PSA ≥6. Although disease characteristics were more advanced at the time of delayed treatment, there were no additional deaths due to prostate cancer with surveillance and only a total of 18% of men experienced biochemical failure. Mean life expectancy for low-risk men treated with surgery between 2004-2006 is projected to be 19.5 years. Under the surveillance scenario, had this cohort selected surveillance they would have experienced only 11.3 treated-person years.

Conclusion: Although active surveillance is associated with more advanced disease characteristics for some low-risk men who go on to be treated, projections of mortality based on these upgraded disease states did not result in any additional deaths. Surveillance offers a substantial reduction in the number of treated-person years. Models can help integrate multiple sources of data to help overcome the extremely long time required to observe outcomes in prospective studies between diagnosis and prostate cancer mortality.

K-6. QUANTITATIVE FECAL OCCULT BLOOD TESTING TO SCREEN FOR COLORECTAL CANCER: POTENTIAL ADVANTAGE OF LOWERING THE POSITIVITY THRESHOLD AND EXTENDING THE SCREENING INTERVAL

2:15 PM - 2:30 PM: Tue. Oct 25, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: HEALTH POLICY AND OUTCOMES RESEARCH in CANCER

Ulrike Haug, Dr., *National Center for Tumor Diseases / German Cancer Research Center, Heidelberg, Germany, Amy B. Knudsen, Ph.D., Massachusetts General Hospital, Boston, MA and Karen M. Kuntz, ScD, University of Minnesota, Minneapolis, MN*

Purpose: Quantitative fecal occult blood tests (FOBTs) allow to specify the positivity threshold. We compared colorectal cancer (CRC) screening strategies with quantitative FOBTs, varying the positivity threshold and adapting the screening interval accordingly (longer intervals for better sensitivity).

Method: We used a Markov state-transition model of CRC to calculate life-years and the lifetime number of screening-related tests (FOBTs and follow-up/surveillance colonoscopies; the number of both procedures were combined using their US cost ratio as weighting factor) for a cohort of US 50-year-olds to whom FOBT screening is offered. We compared 2 strategies: 1) FOBT with per-test specificity of 95% in combination with a screening interval of 1 year (FOBT95-1y) and 2) FOBT with per-test specificity of 80% in combination with a screening interval of 5 years (FOBT80-5y). We selected specificity and screening interval combinations such that both strategies had a similar chance that an individual would experience a

false positive FOBT result during the screening program. Per-test sensitivities for FOBT95-1y and FOBT80-5y were assigned according to ROC curve projections (15% and 30% for small precursor lesions, 35% and 50% for large precursor lesions, and 70% and 90% for CRC, respectively). We assumed perfect adherence in the base-case analyses. In sensitivity analyses, we used recent US data on longitudinal adherence with FOBT screening in community practice that showed that of those who attended FOBT screening, 42%, 44% and 14%, respectively, received 1, 2-3, and 4 or more FOBTs during the 5-year study period.

Result: In the base-case analyses, FOBT95-1y saved 22% more life-years and the number of screening-related tests was 29% higher compared to FOBT80-5y. When using observed data on longitudinal adherence with FOBT, the effectiveness of FOBT95-1y decreased by one third compared with the base-case analyses. The FOBT80-5y strategy was now more effective (given the higher per-test sensitivity), saving 19% more life-years, while requiring 17% more screening-related tests compared with FOBT95-1y.

Conclusion: Taking into account that regular adherence with yearly FOBT screening is low, the potential benefit of this screening strategy is not realized in practice. Lowering the positivity threshold of quantitative FOBT (yielding a higher per-test sensitivity and a lower per-test specificity) in combination with an extended screening interval could be a pragmatic approach to optimize FOBT screening in view of real-life adherence patterns.

L. HEALTH ECONOMICS LUSTED FINALISTS.

1:00 PM - 2:30 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Session Chairs:

- *Ahmed M. Bayoumi, MD, MSc*
- *Phaedra Corso, PhD*

Session Summary:

1:00 PM - 1:15 PM

L-1. OPTIMAL SURVEILLANCE SCHEDULES FOR LOW RISK BLADDER CANCER PATIENTS

1:15 PM - 1:30 PM

L-2. ESTIMATING THE COST OF NO-SHOWS AND EVALUATING THE EFFECTS OF MITIGATION STRATEGIES

1:30 PM - 1:45 PM

L-3. A TRIAL OF LABOR AFTER CESAREAN DECISION ANALYSIS: THE IMPACT OF FUTURE PREGNANCIES

1:45 PM - 2:00 PM

L-4. MODELING CARE UTILIZATION RATIOS TO GUIDE SURGE RESPONSES FOR NON-CRISIS EVENTS

2:00 PM - 2:15 PM

L-5. THE COST-EFFECTIVENESS OF IMPROVEMENTS IN PREHOSPITAL TRAUMA TRIAGE IN THE U.S

2:15 PM - 2:30 PM

L-6. TRANSCATHETER AORTIC VALVE IMPLANTATION SHOULD CHANGE THE MANAGEMENT OF NON-SURGICAL AORTIC STENOSIS CANDIDATES

Abstracts:

L-1. OPTIMAL SURVEILLANCE SCHEDULES FOR LOW RISK BLADDER CANCER PATIENTS

1:00 PM - 1:15 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS.

Yuan Zhang, M.S.[1], *Matthew Nielsen, MD*[2] *and Brian T. Denton, PhD*[1], *(1)North Carolina State University, Raleigh, NC, (2)University of North Carolina, Chapel Hill, NC, USA, Chapel Hill, NC*

Purpose: Bladder cancer has a heterogeneous natural history and a substantial plurality (40%) of incident cases are low grade non-muscle-invasive (NMIBC), with comparatively low risk of progression to life-threatening disease. Practice guidelines for NMIBC suggest intensive surveillance cystoscopy schedules with a limited evidence base, and there is a lack of consensus among the different guidelines for low risk NMIBC.

Method: We use a Partially Observable Markov Decision Process (POMDP) to investigate the optimal schedule of cystoscopies that maximizes expected quality adjusted life years (QALYs). Our model classifies patients into three risk levels with transition probabilities for health states taken from the EORTC risk calculator's recurrence and progression probabilities. Mortality rates are taken from the CDC Vital Statistics Report, and parameters for utility of health states, and disutility of cystoscopy are drawn from the medical literature. Model validation is based on comparison of outputs to published survival data for patients diagnosed with bladder cancer.

Result: We compared the optimal schedule of cystoscopies from our model with the American Urology Association (AUA) and the European Association of Urology (EAU) guidelines for male and female patients aged 50 to 70. The optimal schedule for the base case scenario results in a 0.4 gain in expected QALYs over EAU and AUA guidelines for a 50 year old low risk male patient. Base case results indicate that older

patients should receive less intensive surveillance than younger patients and female patients should undergo slightly more intensive surveillance than similar male patients. Optimal schedules are more intensive than EAU, and less intensive than AUA in the first 5 years of surveillance. Sensitivity analysis indicates that the optimal schedule is highly sensitive to the disutiltity of cystoscopy. For example, the total number of cystoscopies in the first 10 years increases from 10 to 40 when the disutility of cystoscopy drops from 0.05 to 0.01.

Conclusion: Whereas current American guidelines recommend a one-size-fits-all regimen, current European guidelines are based on explicit risk stratification, underscoring uncertainty in this area. We find that surveillance for low risk NMIBC patients should consider patient age, gender, co-morbidity and most of all, disutility of cystoscopy. Optimal schedules can result in considerable QALY gains, particularly for younger patients, compared to current guidelines

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L-2. ESTIMATING THE COST OF NO-SHOWS AND EVALUATING THE EFFECTS OF MITIGATION STRATEGIES

1:15 PM - 1:30 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS.

Bjorn Berg, BA[1], *Michael Murr, BS*[1], *David Chermak, BS*[1], *Jonathan Woodall, MS*[1], *Michael Pignone, MD, MPH*[2] *and Brian T. Denton, PhD*[1], *(1)North Carolina State University, Raleigh, NC, (2)University of North Carolina at Chapel Hill, Chapel Hill, NC*

Purpose: To measure the cost of no-shows and benefit of no-show interventions and overbooking for an outpatient endoscopy suite.

Method: We used a discrete event simulation model based on an outpatient endoscopy suite at UNC Hospital in Chapel Hill, NC, to measure the effect of no-shows on expected net gain. Expected net gain is defined as the difference in expected revenue based on CMS reimbursement rates and variable costs based on the sum of patient waiting time and provider and staff overtime. To build the model, we used a combination of historical time stamp data and time studies to estimate probability distributions for all parts of the endoscopy process including intake, procedure, and recovery times. No-show rates were estimated from historical attendance (18% on average). We used reported improvements in no-show rates from published intervention studies, such as phone reminders, and pre-assessment clinics, with relative reductions in no-show rates ranging from 34.5% to 75.5% to measure their associated effects on expected net gain. In addition to no-show interventions, we evaluated the effectiveness of scheduling additional patients (overbooking) on the expected net gain. We compared interventions and overbooking to a perfect attendance scenario of n=24 patients (the reference scenario) on the basis of expected net gain.

Result: The daily expected net gain with perfect attendance (reference scenario) is $4,433.32. The daily loss attributed to the base case no-show rate of 18% is $725.42 (16.36% of net gain). This loss is sensitive to the no-show rate, ranging from $472.14 to $1,019.29 (10.65% to 22.99% of net gain) for no-show rates of 12% and 24%, respectively. The daily loss relative to the reference scenario associated with implementing no-show interventions ranges from $166.61 to $463.09 (3.76% to 10.45% of net gain). The overbooking policy of 37.5% additional patients resulted in no loss in expected net gain when compared to the reference scenario.

Conclusion: No-shows can significantly decrease the expected net gain of outpatient procedure centers. Interventions such as phone reminders and pre-assessment clinics reduce the no-show rate; but can be costly,

challenging to implement, and do not resolve the problem entirely. Overbooking can help mitigate the impact of no-shows on a suite's expected net gain and has a lower expected cost of implementation to the provider.

L-3. A TRIAL OF LABOR AFTER CESAREAN DECISION ANALYSIS: THE IMPACT OF FUTURE PREGNANCIES

1:30 PM - 1:45 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS.

Karla Solheim, MD[1], *Yvonne Cheng, MD, MPH*[2], *Jeanne-Marie Guise, MD, MPH*[3], *Yasser El-Sayed, MD*[4] *and Aaron B. Caughey, MD, MPP, MPH, PhD*[3], *(1)University of California, San Francisco, San Francisco, CA, (2)University of California, San Francisco, CA, (3)Oregon Health & Sciences University, Portland, OR, (4)Stanford University, Palo Alto, CA*

Purpose: To analyze the decision for trial of labor after one prior cesarean compared with elective repeat cesarean, considering outcomes in future pregnancies in the analysis.

Method: A decision analytic model was designed from the maternal perspective comparing elective repeat cesarean delivery (ERCD) and trial of labor after cesarean (TOLAC). Baseline assumptions included a theoretical cohort of 300,000 women who had experienced only one prior pregnancy delivered via cesarean. Outcome probabilities were derived from the literature for major morbidities, including uterine rupture, maternal death, neonatal death, cerebral palsy, hysterectomy, and future placenta accreta. Costs and utilities taken from the literature were also applied to outcomes. Univariate and multivariate sensitivity analyses on key variables as well as a Monte Carlo simulation were performed for model validation.

Result: ERCD was associated with more accretas (903 vs. 655) and more cesarean hysterectomies (2049 vs. 1602) but fewer uterine ruptures (2693 vs. 0) than TOLAC. Overall, TOLAC was the preferred strategy, resulting in 3,900 additional QALYs for the entire cohort. A one-way sensitivity analysis found the risk of uterine rupture must reach 3.6% before performing an elective repeat cesarean becomes preferred. TOLAC was also cost-saving, costing $1380 less per delivery, for a total cost savings of $414M for the cohort. Even when the model was limited to the 2nd pregnancy, a trial of labor remained the dominant strategy, requiring a threshold of 2.7 % for uterine rupture before elective cesarean became the preferred option. Sensitivity analyses and a Monte Carlo simulation validated the robustness of the model over a broad range of inputs.

Conclusion: TOLAC leads to better outcomes on average than ERCD for women with one prior cesarean even without a history of prior vaginal births. The model's preference for TOL is magnified if future pregnancies are anticipated, given the potential morbidity of future placental abnormalities. TOLAC is also cost saving. Table: Cost-effectiveness of TOLAC versus ERCD after one prior CD

Scenario	Additional QALYs in TOLAC over ERCD	Decreased cost in TOLAC over ERCD
All second pregnancies	+3,900	-$414,000,000
No third pregnancy	+2,700	-$248,000,000

Third pregnancy assumed	+5,400	-$561,000,000

Two-way sensitivity analysis on probabilities of uterine rupture and third pregnancy

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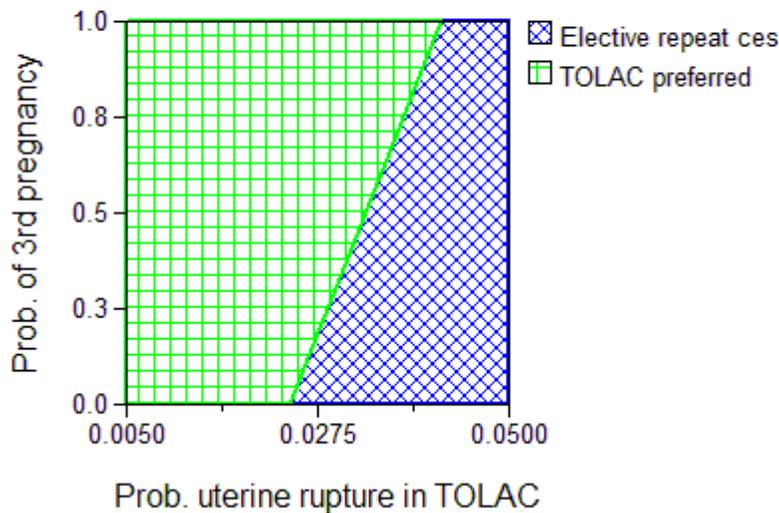
L-4. MODELING CARE UTILIZATION RATIOS TO GUIDE SURGE RESPONSES FOR NON-CRISIS EVENTS

1:45 PM - 2:00 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS.

Valerie Chase, *Mariel S. Lavieri, PhD, Amy Cohn, PhD and Tim Peterson, MD, University of Michigan, Ann Arbor, MI*

Purpose: We investigate the use of statistical models to identify surges in emergency department (ED) volume based on the level of utilization of physician capacity. Our models may be used to guide staffing decisions in non-crisis related patient volume increases.

Method: Patient visits to a large urban teaching hospital with a Level 1 trauma center were collected from July 2009 – June 2010. A comparison of significance was used to assess the impact of multiple variables on the state of the ED. Historical physician utilization data was used to model physician capacity. Binary logistic regression analysis was used to predict the probability that the physician capacity would be sufficient to treat all patients forecasted to arrive. The predictions were performed by various time intervals: 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, 8 hours and 12 hours. The models were validated against 5 consecutive months of similar patient data from July – November 2010. Models and forecast accuracy were evaluated by positive predictive values, Type I and Type II errors, and real-time accuracy in predicting non-crisis surge events.

Result: The ratio of new patients to treat to total physician capacity - termed the "Care Utilization Ratio (CUR)" - was deemed to be a robust predictor of the state of the ED (with a CUR ratio greater than 1 indicating that the physician capacity is not sufficient to treat all patients forecasted to arrive). Among the models investigated, prediction intervals of 30 minutes, 8 hours and 12 hours performed best with deviances of 1.000, 0.951 and 0.864 respectively. The models were validated against the July – November 2010 data set

using significance of 0.05. For the 30-minute prediction intervals, the positive predictive values ranged from 0.738 to 0.872, true positives ranged from 74% to 94%, and true negatives ranged from 70% to 90% depending on the threshold used to determine the state of the ED.

Conclusion: We identified a new and robust indicator of the system's performance: CUR. By investigating different prediction intervals, we were able to model the tradeoff of longer time to response versus shorter but more accurate predictions. Our proposed models would've allowed for an earlier identification of surge in patient volume on "non-crisis" days than current practice.

L-5. THE COST-EFFECTIVENESS OF IMPROVEMENTS IN PREHOSPITAL TRAUMA TRIAGE IN THE U.S

2:00 PM - 2:15 PM: Tue. Oct 25, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: HEALTH ECONOMICS LUSTED FINALISTS.

M. Kit Delgado, MD[1], *David A. Spain, MD*[1], *Kristan Staudenmayer, MD, MS*[1], *Sharada Weir, Ph.D.*[2] and *Jeremy D. Goldhaber-Fiebert, PhD*[3], *(1)Stanford University School of Medicine, Stanford, CA, (2)University of Massachusetts Medical School, Shrewsbury, MA, (3)Stanford University, Stanford, CA*

Purpose: Trauma centers (TC) reduce mortality by 25% for severely injured patients but cost significantly more than non-trauma centers (NTC). The CDC's 2009 prehospital emergency medical services (EMS) guidelines seek to reduce undertriage of these patients to NTC to <5% and reduce overtriage of minor injury patients to TC to <25%. We assessed the cost-effectiveness of improving prehospital trauma triage in U.S. regions with <1 hour EMS access to TCs (84% of the population).

Method: We developed a decision-analytic Markov model to evaluate improvements in prehospital trauma triage given a baseline undertriage rate of major injury patients to NTC of 20% and overtriage rate of minor trauma patients to TC of 50%. The model follows patients from injury through prehospital care, hospitalization, first year post-discharge, and the remainder of life. Patients are trauma victims with a mean age of 43 (range: 18-85) with Abbreviated Injury Scores (AIS) from 1-6. Cost and outcomes data were derived from the National Study on the Costs and Outcomes of Trauma for patients with moderate to severe injury (AIS 3-6), National Trauma Data Bank, and published literature for patients with minor injury (AIS 1-2). Outcomes included costs (2009$), quality adjusted life-years (QALY), and incremental cost-effectiveness ratios.

Result: Reducing undertriage rates from 20% to 5% would yield 3.9 QALYs gained per 100 patients transported by EMS. Reducing overtriage rates from 50% to 25% would save $108,000 per 100 patients transported. Reducing both undertriage to 5% and overtriage to 25% would be cost-effective at $13,300/QALY gained and yield 3.9 QALYS per 100 patients. One could spend $196,000 per 100 patients transported to reduce undertriage to 5% and overtriage to 45% and still achieve an incremental cost-effectiveness ratio below $50,000/QALY. Results were somewhat sensitive to scenarios in which severely injured patients benefited less than expected from treatment at a TC relative to at a NTC or the cost difference of treating patients with minor injures at TCs and NTCs were smaller than expected.

Conclusion: Reducing prehospital undertriage of trauma patients is cost-effective and reducing overtriage of minor injury patients is cost-saving provided patients with minor injuries do not suffer worse outcomes from treatment at NTCs. With approximately 4.5 million annual EMS trauma transports, reducing overtriage by 25% could save up to $4.8 billion/year.

L-6. TRANSCATHETER AORTIC VALVE IMPLANTATION SHOULD CHANGE THE MANAGEMENT OF NON-SURGICAL AORTIC STENOSIS CANDIDATES

Cyrena Torrey Simons, MD, PhD[1], Lauren E. Cipriano, BSc, BA, PhD, Candidate[2], Rashmee U. Shah, MD[3], Mark A. Hlatky, MD[3], Alan M. Garber, MD, PhD[1] and Douglas K. Owens, MD, MS[1], (1)VA Palo Alto Health Care System and Stanford University, Stanford, CA, (2)Stanford University, Stanford, CA, (3)Stanford University School of Medicine, Stanford, CA

Purpose: Aortic stenosis, the most common valvular disease in the elderly, is associated with high morbidity and mortality. Surgical aortic valve replacement is the only treatment option available that prolongs life. Transcatheter aortic valve implantation (TAVI) is a new technology that appears to offer dramatic improvements in the quality and quantity of life of patients with aortic stenosis not eligible for surgical valve replacement. Using the results of the multicenter, randomized control PARTNER trial, we sought to determine if TAVI is cost effective compared with medical management.

Method: We developed a decision analytic Markov model to follow cohorts of 83 year old patients with severe aortic stenosis who also shared the other baseline characteristic seen in the PARTNER RCT: >92% had New York Heart Association (NYHA) class III or IV symptoms, and all had Society of Thoracic Surgeons risk score of 10% or higher. As in the trial, TAVI reduced mortality by 23% over two years. Model costs came from Medicare and the Nationwide Inpatient Sample (2008 US$). We compared the strategies of TAVI and medical management, which included the option of balloon aortic valvuloplasty.

Result: TAVI was the most effective, but also the most expensive, treatment option providing an expected 1.98 QALYs at an average cost of $99,700 per person. In contrast, medical management resulted in 1.25 QALYs at an average cost of $63,200. Compared to medical management, TAVI cost $49,500 per QALY gained. This result was sensitive to annual health care costs in surviving patients. With a willingness to pay threshold of $100,000/QALY, TAVI was the optimal policy if health care costs other than those due to aortic stenosis were <$54,000/year. Clinically appropriate variation in other parameters, like procedural effectiveness, ongoing rates of death, and use of valvuloplasty in the medical treatment arm, had only modest effects on estimated cost-effectiveness. Furthermore, TAVI resulted in 56% of the cohort's remaining life being spent with NYHA class I or II symptoms, instead of class III or IV symptoms. Depending on the extent of valvuloplasty use, the cohort receiving medical management was asymptomatic 0 to only 45% of the time.

Conclusion: TAVI appears to be a cost-effective treatment for patients with symptomatic aortic stenosis who are not candidates for surgery.

SMDM AND SBM (SOCIETY OF BEHAVIORAL MEDICINE) JOINT SYMPOSIUM WHEN DECISIONS DEPART FROM RATIONALITY: EVIDENCE-BASED STRATEGIES FOR UNDERSTANDING "REAL" PATIENT CHOICES.

4:00 PM - 5:30 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Erika A. Waters, PhD, MPH*
- *Suzanne C. O'Neill, PhD*

Abstracts:

WHEN DECISIONS DEPART FROM RATIONALITY: EVIDENCE-BASED STRATEGIES FOR UNDERSTANDING "REAL" PATIENT CHOICES

4:00 PM - 4:15 PM: Tue. Oct 25, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: SMDM AND SBM (SOCIETY OF BEHAVIORAL MEDICINE) JOINT SYMPOSIUM WHEN DECISIONS DEPART FROM RATIONALITY: EVIDENCE-BASED STRATEGIES FOR UNDERSTANDING "REAL" PATIENT CHOICES.

Michael A. Diefenbach, PhD, *Mount Sinai School of Medicine, New York, NY, Karen Emmons, PhD, Dana Farber Cancer Institute, Boston, MA, Paul K. J. Han, MD, MA, MPH, Maine Medical Center, Portland, ME and Ellen Peters, PhD, Ohio State University, Columbus, OH*

There is a well-established discrepancy between decisions predicted by normative models for decision making and the decisions people actually make. This difference is also reflected in medical decision making, where patients are expected to participate in their treatment decisions, yet often make non-normative choices. The problem may be exacerbated in the future, as age-related decrements in cognitive and decision-making ability collide with a rapidly-aging population with growing healthcare needs. These issues will be addressed by the speakers and a discussant who are renowned for their expertise in bridging theoretical and applied research. The speakers will present theoretical frameworks, hypothesisdriven experiments, and evidence-based interventions that achieve optimal decisions and health behaviors without attempting to teach patients to make decisions according to normative models. The discussion will feature the social and policy implications of the research and will encourage questions and commentary from the audience.

Wednesday, October 26, 2011

BEHAVIORAL ECONOMICS SYMPOSIUM: FROM A NUDGE TO A SHOVE: HOW BIG A ROLE FOR SHARED DECISION MAKING

8:00 AM - 9:30 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Anirban Basu, PhD*

Abstracts:

FROM A NUDGE TO A SHOVE: HOW BIG A ROLE FOR SHARED DECISION MAKING

8:00 AM - 8:15 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: BEHAVIORAL ECONOMICS SYMPOSIUM: FROM A NUDGE TO A SHOVE: HOW BIG A ROLE FOR SHARED DECISION MAKING

Kevin Volpp, MD, PhD, *University of Pennsylvania School of Medicine, Philadelphia, PA, Peter A. Ubel, MD, Duke University, Durham, NC and Kit Sundararaman, PhD, Consumerology® Solutions Group, Express Scripts, St. Louis, MO*

Poor adherence is responsible for about half of medication-related hospital admissions, costing $100 billion a year, yet few interventions to date have effectively addressed this problem.Adherence is particularly important for older adults; more than 50% of older adults take five or more medications on a regular basis. Finding ways to change health-related behaviors is a major challenge for health policy yet there is a debate as to how forcefully to intervene. Behavioral economics has been instrumental in developing less forceful mechanisms for encouraging healthy behaviors. These mechanisms have been famously described as "nudges."Yet even within behavioral economics, more forceful incentive schemes are being developed in areas as diverse as nutrition and obesity to employer wellness and adherence. Our speakers will present various examples where there is a tension between subtle and more forceful incentives for behavior change and the relative effectiveness among them.

BD5. BOARD INITIATIVE ROOM, TBD 5

10:15 AM - 11:45 AM: Wed. Oct 26, 2011
Columbus Hall AB (Hyatt Regency Chicago)

M. DECISION AIDS AND DECISION SUPPORT

10:15 AM - 11:45 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Session Chairs:

- *Emmanuelle Belanger, MSc*
- *Michael Pignone, MD, MPH*

Session Summary:

10:15 AM - 10:30 AM

M-1. SHARED DECISION MAKING? EXAMINING MOTHER AND DAUGHTER INFLUENCE ON THE CHOICE TO VACCINATE AGAINST THE HUMAN PAPILLOMAVIRUS

10:30 AM - 10:45 AM

M-2. PERSONALIZED DECISION SUPPORT FOR BREAST CANCER PREVENTION

10:45 AM - 11:00 AM

M-3. IMPROVING PATIENT PARTICIPATION IN DECISION MAKING FOR ATRIAL FIBRILLATION

11:00 AM - 11:15 AM

M-4. INFORMED DECISION MAKING ABOUT BREAST CANCER CHEMOPREVENTION: RCT OF AN ONLINE DECISION AID INTERVENTION

11:15 AM - 11:30 AM

M-5. DO INFORMED CONSENT DOCUMENTS MAKE GOOD DECISION AIDS?

11:30 AM - 11:45 AM

M-6. A PATH MODEL OF FACTORS THAT INFLUENCE SATISFACTION WITH DECISION SUPPORT AMONG SURROGATE DECISION MAKERS OF THE CHRONICALLY CRITICALLY ILL

Abstracts:

M-1. SHARED DECISION MAKING? EXAMINING MOTHER AND DAUGHTER INFLUENCE ON THE CHOICE TO VACCINATE AGAINST THE HUMAN PAPILLOMAVIRUS

10:15 AM - 10:30 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

A. Scott LaJoie, PhD, MSPH[1], *M. Cynthia Logsdon, PhD, ARNP, FAAN*[1], *Melissa D. Pinto-Foltz, PhD, RN*[2], *Ronald L. Hickman Jr., PhD, ACNP-BC*[2] *and S. Paige Hertweck, MD*[1], *(1)University of Louisville, Louisville, KY, (2)Case Western Reserve University/Cleveland Clinic, Cleveland, OH*

Purpose: The human papillomavirus (HPV) is a common infection that has been linked to several cancers. A vaccine has been developed for adolescents. This study measures the influences of the attitudes of daughter and mother on the decision to immunize the daughter.

Methods: The Theory of Planned Behavior guided the development and analysis of survey data collected from 72 mother-and-daughter dyads. Additional information was collected regarding the relationship between mother and daughter. Two structural equation models (SEM) were created; one to relate the mother's behavioral attitude, subjective norms, and perceived behavioral control with her intention and decision whether to vaccinate the daughter. The second expanded the model to include variables related to the dyad. Additional analyses compared whether the daughter shared similar attitudes and beliefs to her mother.

Results: Mothers (average age = 44 years) were mainly Caucasian (73%), at least high school educated (62%), and married (64%). Their daughters (average age = 15 years) were mainly in grade 9 or lower (69%) and only 35% reported being in a dating relationship. The mother's intention to vaccinate was predicted by her behavioral attitude (B=.39, p<.001), normative beliefs (B=.31, p<.001), and perceived behavioral control (B=.31, p<.001); intention predicted her vaccine decision (B=.31, p<.001). The basic SEM was a good fitting model (RMSEA=.001, PCLOSE=.52). The three variables strongly predicted intention (r-square = .68, p<.001); regressing perceived behavioral control and intention on the decision (yes or no) to vaccinate resulted in an odds ratio = .33 (p<.001). The addition of variables related to the mother's relationship to her daughter and her parenting style did not significantly improve the model's predictability. The mother and daughter did not always hold the same attitudes toward vaccination; only their normative beliefs were correlated (r=.42, p<.001).

Conclusion: In the decision to vaccinate an adolescent female against different cancer-causing strains of HPV, there appears to be little shared decision making. Mainly, the attitudes and beliefs of the mother dictate whether the daughter receives the vaccine. Efforts to increase the HPV vaccine acceptance rates should focus on educating mothers about the benefits and risks associated with her decision.

M-2. PERSONALIZED DECISION SUPPORT FOR BREAST CANCER PREVENTION

10:30 AM - 10:45 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

*Zehra Omer, Karen Carlson, MD and **Elissa M. Ozanne, PhD**, Massachusetts General Hospital, Boston, MA*

Purpose: Breast cancer prevention has the potential to decrease the incidence of the disease, yet remains underused. We have developed a web-based tool that provides automated risk assessment and personalized decision support designed for collaborative use between patients and clinicians. We assessed the feasibility of using this tool in a primary care setting.

Methods: Women, 40-65, were recruited from a schedule of patients attending annual physicals in a primary care clinic at an academic hospital. Patients with a history of breast cancer, genetic testing, or chemoprevention education were excluded. Information used to assess breast cancer risk was gathered from phone interviews and medical records. Patients were randomized to view the decision aid either before their appointment or with their PCP during their appointment. Feasibility of the decision aid was assessed through: 1) Visit duration; 2) Patient Acceptability; and 3) Clinician Satisfaction. The outcomes were gathered from surveys administered to patients before and after appointments, and to providers after appointments.

Results: 64 women were approached over 5-months. 42/64 (68%) consented and were enrolled. 26/42 (62%) patients viewed the decision aid. Use of the decision aid did not result in a longer visit (p=0.57). Nor did it negatively influence the provider's satisfaction with the visit (p=0.28). A majority of patients had a positive review of the decision aid and thought it was helpful in making a decision. A higher number of subjects who viewed the decision aid were either at moderate or high risk as calculated by the Gail or BRCAPro models (p =0.0138). 15/42 (36%) patients were at moderate or high risk. The PCPs' perceptions of these patients' risk was in line with the calculated risk for 11/15 (73%) of the patients. While a discussion regarding breast cancer risk reduction occurred with 14/15 (93%) of these patients, PCPs chose to use the decision aid during the appointment with 6/15 (40%) of them.

Conclusions: Performing personalized risk assessment and use of the decision aid in the primary care setting was feasible and acceptable. These results suggest risk assessment alone is enough to encourage a discussion about breast cancer risk reduction for some providers. This method of risk assessment and decision support holds promise in the effort to reduce the incidence and burden of breast cancer.

M-3. IMPROVING PATIENT PARTICIPATION IN DECISION MAKING FOR ATRIAL FIBRILLATION

10:45 AM - 11:00 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

Liana Fraenkel, MD, MPH, *Yale School of Medicine, New Haven, CT and Terri Fried, MD, Yale School of Medicine, West Haven, CO*

Purpose: Guidelines recommend that treatment decisions for nonvalvular atrial fibrillation (NVAF) incorporate patient preferences. We designed a multicomponent decision tool to inform patients of their individual risks of stroke and bleed over a meaningful time period (5 years), assist patients in clarifying their priorities, and to facilitate patient-physician communication.

Methods: We conducted a pilot, clustered randomized controlled trial, in which patients assigned to one group of providers completed the decision tool before seeing their primary care physician and patients assigned to a second group received usual care. Data were collected pre- and post visit to assess outcomes. Visits were audiotaped. The primary outcome variables were the Informed and Values Clarity subscales of the low-literacy version of the Decisional Conflict Scale [6]. Secondary outcomes were: knowledge, anxiety, worry, rationale for preferred treatment, and discussion of NVAF-related outcomes. Between group differences were measured using a linear regression model which included sociodemographic characteristics, quality of life, and baseline scores. A sample size of 135 was calculated assuming, Type 1 error of 0.05, power of 0.80, two-tailed, an effect size (Cohen's d) of 0.5 after inflating the initial estimate by 5% for possible missing values.

Results: 69 patients were enrolled in the intervention group and 66 in the control group. Participants in the intervention group had lower scores on the Informed [11.9 (-21.1, -2.7)] and Values Clarity subscales [-14.6 (-22.6, -6.6)]. Participants in the intervention group were more likely to be able to name the medications for reducing stroke risk (61% vs 31%, p<0.001) and to know their side effects (49% vs 37%, p=0.07), although the latter did not reach statistical significance. The risk of stroke was discussed more frequently in the intervention than control group (71% vs 12%, p<0.0001), as was the risk of bleed (71% vs 21%, p<0.0001). Between groups differences for remaining outcomes are presented in the table.

Conclusion: The tool was effective at improving perceived knowledge and value clarity and at increasing physician-patient communication.

	Intervention (mean)	Control (mean)	Difference (95% CI)	P-Value
Accuracy: stroke risk	9.1	14.2	-5.2 (-1.9, -8.4)	<.001
Accuracy: bleeding risk	8.7	13.1	-4.4 (1.4, -7.5)	<.001
Anxiety	13.0	13.4	-0.38 (-1.4, .67)	0.46
Worry: stroke risk	1.8	1.6	0.18 (-0.31, .66)	0.47
Worry: bleeding risk	1.5	1.9	-0.43 (-1.1, .29)	0.24

M-4. INFORMED DECISION MAKING ABOUT BREAST CANCER CHEMOPREVENTION: RCT OF AN ONLINE DECISION AID INTERVENTION

11:00 AM - 11:15 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

Andrea Fuhrel-Forbis[1], Ida J. Korfage, PhD[2], Peter A. Ubel, MD[3], Dylan Smith, PhD[4], Brian J. Zikmund-Fisher, PhD[1], Jennifer B. McClure, PhD[5], Sarah M. Greene, MPH[5], Azadeh Stark, PhD[6], Sharon M. Hensley Alford, PhD[6], Rosemarie K. Pitsch[7], Holly Derry, MPH[1], Amanda J. Dillard, PhD[8] and Angela Fagerlin, PhD[9], (1)University of Michigan, Ann Arbor, MI, (2)Erasmus MC - University Medical Center, Rotterdam, Netherlands, (3)Duke University, Durham, NC, (4)Stony Brook University, Stony Brook, NY, (5)Group Health Research Institute, Seattle, WA, (6)Henry Ford Health System, Detroit, MI, (7)Health Media, Inc., Ann Arbor, MI, (8)Grand Valley State University, Allendale, MI, (9)VA Ann Arbor Healthcare System & University of Michigan, Ann Arbor, MI

Purpose: To examine the impact of an online decision aid (DA) intervention on informed decision making about chemoprevention.

Method: Women aged 46-74 at high risk of breast cancer were recruited from 2 U.S. HMOs. Participants were randomly assigned to 1 of 3 groups: *intervention group* (viewed online DA and answered post-test chemoprevention questions); *standard control group* (did not receive DA but answered post-test chemoprevention questions), or *3-month follow-up control group* (did not receive DA or answer post-test chemoprevention questions). 585 women completed post-test and 3-month follow-up questionnaires. Using Marteau, Dormandy, and Michie's (2001) definition of informed decisions, we created a dichotomous composite variable, "informed decision," equal to "1" for women with sufficient knowledge (correctly answered at least 50% of gist knowledge questions) who also made a decision about chemoprevention consistent with their attitudes toward the drugs. Women with insufficient knowledge or with decisions inconsistent with their attitudes received a score of "0."

Result: At post-test, 54% of the intervention group and 6% of the standard control group made informed decisions, OR=17.69, p<.001, 95% CI=7.56, 41.38. Informed decisions may be based on prior knowledge despite current knowledge having dropped off, so we assessed post-test knowledge with decision-making at follow-up; the intervention group (44%) made informed decisions more frequently than the standard control group (3%), OR=25.67, p<.001, CI=7.99, 82.49. At follow-up there was a trend toward the intervention group making more informed decisions (18%) than either of the control groups (12% standard control vs. 8% 3-month control), but overall this difference was not statistically significant, $X^2(2)=5.396$, p=.067. Post-test sufficient knowledge occurred more frequently in the intervention group (62%) compared to standard control (7%), $X^2(1)=97.528$, p<.001. At follow-up, the intervention group (25%) was more likely than either control group (15% standard control vs. 12% 3-month control) to have retained sufficient knowledge for an informed decision $X^2(2)=10.71$, p=.005.

Conclusion: Women given a DA describing risks and benefits of tamoxifen and raloxifene were significantly more likely to make *informed decisions* about undergoing chemoprevention for breast cancer immediately after reading the DA. The intervention materials impacted knowledge and alignment of attitudes with decisions, but this effect faded over time. These results suggest that providing booster information and tools to help patients recall their initial decision processes may increase informed decision making.

M-5. DO INFORMED CONSENT DOCUMENTS MAKE GOOD DECISION AIDS?

11:15 AM - 11:30 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

Jamie C. Brehaut, PhD[1], Kelly Carroll, MA[1], Glyn Elwyn, MD, PhD[2], Raphael Saginur, MD[3], Jonathan Kimmelman, PhD[4], Kaveh Shojania, MD[5], Ania Syrowatka, BSc[1], Trang Nguyen, BSc[1], Erica Hoe, BSc[1] and Dean Fergusson, PhD[1], (1)Ottawa Hospital Research Institute, Ottawa, ON, Canada, (2)Cardiff University, Cardiff, United Kingdom, (3)The Ottawa Hospital, Ottawa, ON, Canada, (4)McGill University, Montreal, QC, Canada, (5)Sunnybrook Health Sciences Centre, Toronto, ON, Canada

Purpose: Current informed consent processes tend to emphasize information provision rather than careful deliberation and decision-making. The International Patient Decision Aids Standards (IPDAS) provide recommendations for working systematically through difficult decisions, such that decision makers will understand outcome probabilities, explicitly weigh benefits and harms, and consider which outcomes they value most. We assessed informed consent documents (ICDs) according to these recommendations.

Methods: 139 ICDs for trials registered with ClinicalTrials.gov were obtained from study investigators. Using a 4-point scale (strongly agree, agree, disagree, strongly disagree), two raters assessed each ICD on 32 items. If the mean rating was within the "agree" range, the ICD was said to conform to that item.

Results: Overall agreement between raters was 95.1%. For the 12 items focused on providing information about options, conformity (i.e. the percentage of the sample rated 'strongly agree' or 'agree' to that item) was above 50% for only 3 items, while conformity was 0% for another 4 items. For 8 items focused on clear presentation of probabilities of outcomes, conformity was below 20% for all 8. For the 2 items focused on clarifying and expressing values, conformity was below 10%. For the 2 items focused on improving structured guidance in deliberation, conformity was below 5%. For the 4 items focused on using evidence to facilitate decision making, 1 item showed conformity in more than 50% of the sample, while the others showed conformity below 5%. For 4 items focused on disclosure and transparency, conformity was high (above 60% for 2, above 80% for the others).

Conclusions: This study shows that existing ICDs do not conform to many standards known to encourage good-quality decision making. These standards make clear and testable predictions about how one might go about improving the extent to which trial participation decisions are fully informed.

M-6. A PATH MODEL OF FACTORS THAT INFLUENCE SATISFACTION WITH DECISION SUPPORT AMONG SURROGATE DECISION MAKERS OF THE CHRONICALLY CRITICALLY ILL

11:30 AM - 11:45 AM: Wed. Oct 26, 2011
Grand Ballroom EF (Hyatt Regency Chicago)
Part of Session: DECISION AIDS AND DECISION SUPPORT

Ronald L. Hickman Jr., PhD, RN, ACNP-BC, *Case Western Reserve University, Cleveland, OH*

Purpose: The acuity of the chronically critically ill (CCI) and the increased rates of cognitive impairment in this emerging cohort enhances the complexity of shared decision making. Often surrogate decision makers (SDMs) are required to make complex health care decisions without certainty of the patient's likelihood of survival or long-term quality of life. This cross-sectional study examines dispositional and situational factors that influence the satisfaction with decision support among SDMs of cognitively impaired CCI patients.

Methods: A dispositional stress and coping framework guided the development of the path model and analysis of survey data collected from 216 SDMs of the CCI. A path model was created with Analysis of Moment Structure (AMOS version 19), which consisted of the following dispositional and situational factors: dispositional cognitive appraisal (threat, resources, and centrality subscales of the Stress Appraisal Measure), informational coping style (monitor subscale of the Abbreviated Miller Behavioral Style Scale), depressive symptoms (Center for Epidemiological Studies-Depression Scale), role stress ("How stressful has it been making decisions for your loved one?"), satisfaction with decision support (informational and decision support subscale of the revised Critical Care Family Satisfaction Survey for chronic critical illness), and the SDM's gender.

Results: On average, SDMs (mean age = 52 years) were Caucasian (62%), females (76%), high school educated (65%) and the spouse (34%), adult child (28%), or parent (22%) of a cognitively impaired CCI patient. Overall, the path model had an excellent model fit to our data (χ^2= 14.9, df = 20, p=.78, TLI = 1.07, CFI = 1.00, RMSEA =.000). Threat appraisal (β=.40, p<.001) had a direct effect on informational coping style, and threat appraisal was correlated with centrality (r =.68, p<.001) and resources (r =-.20, p<.01). Gender (β=-.15, p<.05), informational coping style (β=.17, p<.05), and threat appraisal (β=.21, p<.05) had a direct effect on depressive symptoms. Depressive symptoms (β=.45, p<.001) had a direct effect on role stress, and role stress (β=-.14, p=.05) had a direct effect on satisfaction with decision support.

Conclusion: Among SDMs of CCI patients, role stress directly impacts their appraisal of satisfaction with decision support. Interventional research that targets threat appraisal, adapts to informational coping style, and reduces depressive symptoms may reduce the SDM's perception of role stress and enhance satisfaction with decision support.

N. METHODS TO PROMOTE CVD AND DIABETES PREVENTION

10:15 AM - 11:45 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Session Chairs:

- *Nilay D. Shah, PhD*
- *Steven M. Kymes, Ph.D.*

Session Summary:

10:15 AM - 10:30 AM

N-1. DRONEDARONE COST OFFSET ACHIEVED BY REDUCTION OF ATRIAL FIBRILLATION/FLUTTER PATIENT HOSPITALIZATION: RESULTS FROM THE FIRST 12 MONTHS OF FOLLOW-UP DURING THE ATHENA TRIAL

10:30 AM - 10:45 AM

N-2. COST-EFFECTIVENESS OF NON-INVASIVE CARDIAC IMAGING TECHNOLOGIES IN OUTPATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE

10:45 AM - 11:00 AM

N-3. USING A WEB-BASED SELF-ASSESSMENT TOOL TO DETECT AND TREAT HYPERCHOLESTEROLAEMIA: THE COST–EFFECTIVENESS OF THE HEARTAWARE RISK FACTOR SCREENING PROGRAM

11:00 AM - 11:15 AM

N-4. OPTIMAL CUT-POINT OF DIABETES RISK SCORES TO IDENTIFY UNDIAGNOSED DIABETES: A COST-EFFECTIVENESS PERSPECTIVE

11:15 AM - 11:30 AM

N-5. ANATOMIC VS. FUNCTIONAL TESTING IN PATIENTS WITH STABLE CHRONIC CHEST PAIN SYNDROME AND THE EFFECT OF NON-OBSTRUCTIVE CORONARY ARTERY DISEASE – A COST-EFFECTIVENESS ANALYSIS

11:30 AM - 11:45 AM

N-6. EVIDENCE-BASED PREVENTIVE SERVICE DELIVERY AND MISSED OPPORTUNITIES DURING PERIODIC HEALTH EXAMINATIONS

Abstracts:

N-1. DRONEDARONE COST OFFSET ACHIEVED BY REDUCTION OF ATRIAL FIBRILLATION/FLUTTER PATIENT HOSPITALIZATION: RESULTS FROM THE FIRST 12 MONTHS OF FOLLOW-UP DURING THE ATHENA TRIAL

10:15 AM - 10:30 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

***Matthew Reynolds, MD**[1], Peter Zimetbaum, MD[1], Françoise Diamand[2], Mehul Jhaveri, PharmD, MPH[3], Gaëlle Bego-Le Bagousse[4], Jay Lin, Ph.D., MBA[5] and Adam Plich[6], (1)Beth Israel Deaconess Medical Center, Boston, MA, (2)Keyrus, Levallois-Perret, France, (3)sanofi-aventis U.S., Bridgewater, NJ, (4)sanofi-aventis R&D, Massy, France, (5)Novosys Health, Flemington, NJ, (6)Medaxial Ltd, London, United Kingdom*

Purpose: This analysis assessed reduction of cardiovascular (CV) hospitalizations in the first 12 months of the ATHENA trial and the associated cost savings in the US.

Method: The ATHENA trial randomized atrial fibrillation/flutter (AF/AFL) patients (mean age 71.6 years) with ≥1 other CV risk factor to dronedarone (n=2,301) or placebo (n=2,327), plus standard care. In this cost analysis, hospitalization costs, derived from claims data for a US cohort of 'ATHENA-like' AF/AFL patients with Medicare supplemental insurance (n=10,200), were applied to hospitalization events occurring during the first 12 months of the ATHENA trial. Cost inputs (2008 values) were (i) weighted mean CV hospitalization costs, categorised according to admission cause, and (ii) Diagnosis Related Groups costs of hospitalizations for adverse events (AEs) in ATHENA. Cost variations were assessed using Monte Carlo sensitivity analysis.

Result: During the first 12 months of ATHENA, overall CV hospitalizations fell by 29% with dronedarone (33.36 *vs.* 47.19 events/100 patients, dronedarone *vs.* placebo). Based on the observed hospitalizations and derived costs, the overall cost savings with dronedarone were estimated at (mean ± SD) $1,328 ± 176 per patient (Table). The estimated savings in CV hospitalization costs (mean $1,341 per patient) heavily outweighed the added estimated AE hospitalization costs (mean $12 per patient). Sensitivity analysis showed the cost offset ranged between $594−$2,124 over 10,000 cycles of Monte Carlo simulation.

Conclusion: Dronedarone offers early cost benefits in AF/AFL, producing estimated mean hospital-related cost savings of $1328 per patient within the first 12 months of treatment in the ATHENA population.

Hospitalization cause	Hospitalizations/100 patients[1]		Default cost/hospitalization	Hospitalization cost saving/patient
	Placebo + standard care	Dronedarone + standard care		
Myocardial infarction/unstable angina	3.14	1.69	$17,360	$250

Cardiac arrhythmia & conduction disorders	26.69	15.38	$8,601	$972
Cardiovascular surgery	2.58	2.52	$21,233	$12
Worsening heart failure, pulmonary edema/cardiac dyspnea	5.54	4.26	$9,945	$128
Implantation of cardiac device	2.15	1.69	$18,272	$83
Transient ischemic attack/stroke	1.59	1.30	$9,006	$26
Other cardiovascular[2]	5.50	6.52	$12,807	−$130
Total cardiovascular hospitalizations	47.19	33.36	–	$1,341
Adverse events[3]	0.21	0.48	$4,681	−$12
All hospitalization events	**47.40**	**33.84**	–	**$1,328**

1. Numbers rounded from 3 decimal places; 2. Cardiac transplantation, cardiovascular infection, pulmonary embolism/deep vein thrombosis, non-fatal cardiac arrest, major bleeding, atherosclerosis-related, syncope, blood pressure-related, stable angina pectoris or atypical chest pain; 3. Non-cardiovascular and treatment-related.

N-2. COST-EFFECTIVENESS OF NON-INVASIVE CARDIAC IMAGING TECHNOLOGIES IN OUTPATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE

10:30 AM - 10:45 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

Gabrielle van der Velde, DC, PhD[1], *Luciano Ieraci, MSc*[1], *Mike Paulden, MA., MSc.*[1], *Harindra C. Wijeysundera, MD*[2], *William Witteman, MISt*[1] *and Murray D. Krahn, MD, MSc*[1], *(1)Toronto Health Economics and Technology Assessment (THETA) Collaborative, Toronto, ON, Canada, (2)Schulich Heart Center, Sunnybrook Health Sciences Center, Toronto, ON, Canada*

Purpose: To evaluate the relative cost-effectiveness of six non-invasive cardiac imaging tests in stable outpatients with suspected coronary artery disease (CAD) including: 1) stress echocardiography (Echo), 2) stress Echo with contrast agent (Echo+Contrast), 3) stress Echo with contrast agent used only if initial results are not interpretable (Echo>Contrast), 4) 64-slice computer tomography angiography (CTA), 5) cardiac

magnetic resonance imaging (CMRI), and 6) stress single-photon emission computed tomography (SPECT).

Method: A decision-analytic Markov model was constructed to simulate the costs and consequences of diagnostic testing in a hypothetical cohort of patients presenting with chest pain in an ambulatory setting, with an intermediate risk of CAD after clinical evaluation. Resource use and costs were derived from Ontario data sources, including the Ontario Health Insurance Plan Schedule of Benefits and Ontario Case Costing Initiative. Estimates of diagnostic test characteristics (sensitivity, specificity) were identified by systematic review and statistically pooled using a bivariate regression approach. Data sources for other model parameters were published data identified by systematic review. The analysis took the perspective the Ontario public health care system and was conducted over a lifetime time horizon. Costs were expressed in 2008-2009 Canadian prices. The primary outcome was quality-adjusted life years (QALYs). Costs and QALYs were discounted at an annual rate of 5%. Cost-effectiveness was evaluated using two conventional willingness-to-pay thresholds: $50,000 per QALY and $100,000 per QALY. Uncertainty around the results was explored with probabilistic sensitivity analysis with 10,000 simulations.

Result: Echo>Contrast was the least expensive test (expected lifetime costs of $21,536) with expected lifetime QALYs of 10.02. CTA was more slightly more expensive ($21,618) and effective (expected lifetime QALYs of 10.05) than Echo>Contrast; thus CTA was cost-effective relative to Echo>Contrast with an incremental cost-effectiveness ratio of $2,958 per QALY. CTA dominated Echo, Echo+Contrast, CMRI, and SPECT, and extendedly dominated Echo. The probability that CTA was cost-effective at a willingness-to-pay of $50,000 per QALY and $100,000 per QALY was 0.929 and 0.934, respectively. Varying individual parameter values across plausible ranges in a series of 1-way sensitivity analyses did not change the finding that CTA was cost-effectiveness.

Conclusion: Sixty-four slice computer tomography angiography appears to be a cost-effective non-invasive cardiac imaging option for intermediate risk patients with suspected CAD in an ambulatory setting.

N-3. USING A WEB-BASED SELF-ASSESSMENT TOOL TO DETECT AND TREAT HYPERCHOLESTEROLAEMIA: THE COST–EFFECTIVENESS OF THE HEARTAWARE RISK FACTOR SCREENING PROGRAM

10:45 AM - 11:00 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

Justin B. Dickerson, MBA[1], *Catherine J. McNeal, MD, PhD*[2], *Matthew Lee Smith, PhD, MPH*[1] *and Marcia G. Ory, PhD, MPH*[1]*, (1)Texas A&M Health Science Center, School of Rural Public Health, College Station, TX, (2)Texas A&M Health Science Center, College of Medicine/Scott & White Healthcare, Temple, TX*

Purpose: To evaluate the cost-effectiveness of using a web-based self-assessment tool to detect cases of Hypercholesterolaemia and subsequently treat with statin therapy.

Methods: Data was collected from 25,364 users of the *HeartAware* risk factor self-assessment tool administered through a nationwide network of 127 hospitals and clinics. The web-based tool asked participants to report several risks factors for heart disease including: low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, systolic and diastolic blood pressure, diabetes and smoking status, medical history, and family history of disease. Responses enabled the calculation of heart disease risk. Participants identified as high risk were eligible for selection by hospitals or clinics for no-cost clinical screening of the same risk factors. Participants with no history of heart disease and those with both self-

reported and clinically measured risk factors were included in the analytic sample. A decision-tree determined if sample members would qualify for statin therapy based on inter-rater agreement of self-reported and clinical measures, prior usage of cholesterol lowering medications, and clinical guidelines for statin therapy established by the Adult Treatment Panel III. *HeartAware* screening costs were measured along with costs of follow-up testing and treatment for those identified for statin therapy. Cost avoidance associated with reduced risk of heart disease was calculated. Life years gained (LYG) as a result of statin therapy was used to calculate cost per LYG. Sensitivity analysis was also performed for scenarios of low statin adherence and enhanced screening methodologies. Findings were compared to prior studies of cost-effectiveness for opportunistic and universal familial hypercholesterolaemia screening as well as accepted thresholds for cost per LYG.

Results: The analytic sample contained 5,884 participants, with 225 eligible for statin therapy. *HeartAware* resulted in a cost per LYG of $16,665. Sensitivity analysis for 50% statin adherence resulted in a cost per LYG of $16,428, while enhanced screening methodologies indicated a cost per LYG between $7,620 and $14,607.

Conclusion: Prior studies of opportunistic and universal screening indicate a cost per LYG of $20,313 and $23,413 respectively. Accepted thresholds for cost per LYG are between $35,000 and $60,000. *HeartAware* is more cost effective than these established screening methodologies, and also favorable relative to accepted willingness to pay thresholds. As such, it should be considered a viable alternative screening method for heart disease.

N-4. OPTIMAL CUT-POINT OF DIABETES RISK SCORES TO IDENTIFY UNDIAGNOSED DIABETES: A COST-EFFECTIVENESS PERSPECTIVE

11:00 AM - 11:15 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

Xiaohui Zhuo, PhD[1], Ping Zhang, PhD[1], Kai McKeever Bullard, PhD[1] and Edward Gregg, PhD[2],
(1)Centers for Disease Control and Prevention, Atlanta, GA, (2)Centers for Disease Control and Prevention, Atlatna, GA

Purpose: The American Diabetes Association (ADA) developed a questionnaire-based scoring system to screen for undiagnosed diabetes, wherein persons with a score of ≥10 are considered at high risk and recommended for further screening. We assessed the cost-effectiveness of the recommended cutoff score of 10 and other alternative cut-points of the scoring system.

Method: We used a validated simulation model to estimate the lifetime cost-effectiveness associated with a 1 point increment in risk score from 5 to 15. We used data from the National Health and Nutritional Examination Survey (2007) to estimate the prevalence and characteristics of the undiagnosed diabetes population, and sensitivities and specificities of each alternative cutoff. Persons who screened positive were assumed to receive a follow-up diagnostic test and intensive glycemic management if confirmed to have diabetes. Outcomes were measured by expected life-years, quality-adjusted life-years (QALYs), and medical costs. Incremental Cost-Effectiveness Ratio (ICER) of one cutpoint was measured by the incremental cost per QALY gained comparing with its next higher cutpoint. The analysis was conducted from a societal perspective.

Results: The proportion of undiagnosed diabetes detected, health benefit, cost and ICER by alterative cutoff score are presented in the table. A lower cutpoint resulted in a larger proportion of the undiagnosed

diabetes detected and greater health benefits, but also in higher medical costs and higher ICER. The cutpoints in the range of 11 to 15 have ICERs lower than $50,000 and the cutpoint of 10 was associated with an ICER of $55,000/QALY.

Cutpoint	Undiagnosed Diabetes Cases Detected,%	Life-year Gained†	QALY Gained†	Incremental Cost	Cost per QALY
5	77.8	0.009	0.008	1,420	176,000
6	70.5	0.010	0.012	1,088	94,000
7	64.6	0.012	0.013	911	72,000
8	64.3	0.015	0.014	809	60,000
9	57.1	0.016	0.013	794	59,000
10	31.4	0.017	0.014	787	55,000
11	21.1	0.018	0.016	760	48,000
12	29.7	0.018	0.016	718	44,000
13	18.8	0.021	0.016	677	43,000
14	7.3	0.029	0.015	620	42,000
15	1.1	- *	-	-	

* cutpoint 15 is the reference group of cutpoint 14. † per person screened

Conclusions: There was a tradeoff between the total health benefit and economic efficiency by lowering the cutoff score. If $50,000/QALY were used as the acceptable willingness-to-pay threshold, a cutoff score of ≥11 should be selected.

N-5. ANATOMIC VS. FUNCTIONAL TESTING IN PATIENTS WITH STABLE CHRONIC CHEST PAIN SYNDROME AND THE EFFECT OF NON-OBSTRUCTIVE CORONARY ARTERY DISEASE – A COST-EFFECTIVENESS ANALYSIS

11:15 AM - 11:30 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

***Alexander Goehler, MD, MSc, MPH**[1], James C. Bayley, BSc[2], Julia EH Nolte, MBA[3], Thomas J. Brady, MD[2], G. Scott Gazelle, MD, MPH, PhD[4] and Udo Hoffmann, MD, MPH[2], (1)Massachusettes General Hospital, Boston, MA, (2)Cardiac MR PET CT Program, Boston, MA, (3)Institute for Technology Assessment, Boston, MA, (4)Massachusetts General Hospital, Boston, MA*

Purpose: For the initial assessment of patients with stable chest pain syndrome, coronary CT angiography (CTA) has evolved as an alternative to functional testing (FT) for the detection of obstructive coronary artery

disease (CAD). However, uncertainty remains about its overall diagnostic value including the identification of non-obstructive CAD given the current absence of treatment. Our objective was to evaluate clinical outcomes, costs, and cost-effectiveness of different anatomic and functional test modalities in the light of potential treatments for non-obstructive CAD.

Methods: Design: Cost-effectiveness analysis using a microsimulation model to simulate incidence and progression of CAD (non-obstructive and obstructive) as a function of patient age, gender and cardiac risk profile. Mortality risk depended on patient's demographics, CVD and treatment status. Potential treatment effect on non-obstructive CAD was based on decreasing the Framingham risk score (hypothetical life-style modifications) and secondary prevention studies. Target population: Patients with chronic chest pain syndrome. Time horizon: Diagnostic phase, lifetime. Discount rate: 3%. Perspective: Societal. Interventions: (1) preventive treatment (SOC) to (2) CTA (CTA), (3) stress-EKG/stress-echo/SPECT (in 20%, 50%, and 30%) (FT), (4) FT followed by CTA if FT positive or indeterminate (FT-CTA), (5) CT followed by FT if CTA positive or indeterminate (CTA-FT). Outcomes: Diagnostic results, discounted quality-adjusted life expectancy (QALE) and lifetime costs, incremental cost-effectiveness ratio (ICER).

Results: In our base case population (males, 50 years, low risk for CAD) the prevalence of CAD was estimated at 53% (13% obstructive). FT correctly identified 13% (10%) at $469/patient; CTA 44% (12%), CTA-FT 49% (9%), FT-CTA 17% (9%) at $599, $663, and $605 per patient, respectively. The model predicted an average remaining life expectancy of 22.01 quality-adjusted life years (QALY) for SOC and 22.27, 22.33, 22.20 and 22.21 QALYs for FT, CTA, CTA-FT, and FT-CTA, respectively. This resulted in an ICER of $13,800/QALY for FT compared to SOC, and of $20,000/QALY for CTA vs. FT; CTA-FT and FT-CTA were both dominated. When applying potential treatment benefit to patients with non-obstructive CAD, CTA dominated most other strategies across a broad range of CAD prevalences (figure).

Conclusion: Preliminary analyses indicate that CTA is cost-effective compared to functional testing as an initial evaluation method for patients with chronic chest pain. These results are independent of treatment effect on non-obstructive CAD.
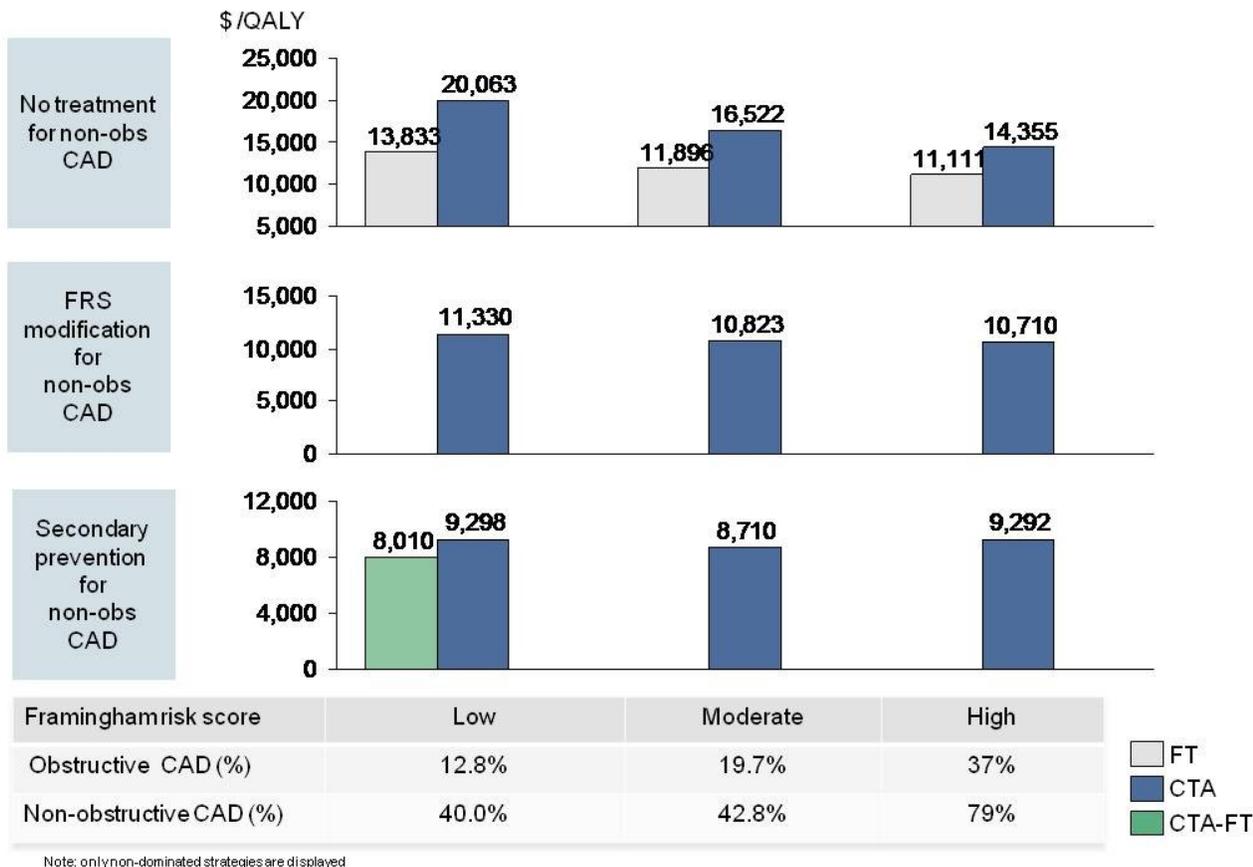
$/QALY

Framingham risk score	Low	Moderate	High
Obstructive CAD (%)	12.8%	19.7%	37%
Non-obstructive CAD (%)	40.0%	42.8%	79%

FT
CTA
CTA-FT

Note: only non-dominated strategies are displayed

N-6. EVIDENCE-BASED PREVENTIVE SERVICE DELIVERY AND MISSED OPPORTUNITIES DURING PERIODIC HEALTH EXAMINATIONS

11:30 AM - 11:45 AM: Wed. Oct 26, 2011
Grand Ballroom CD (Hyatt Regency Chicago)
Part of Session: METHODS TO PROMOTE CVD AND DIABETES PREVENTION

*Deirdre A. Shires, MPH, MSW[1], Kurt Stange, MD[2], George Divine, PhD[1], Scott Ratliff[3], Ronak Vashi[1], Ming Tai-Seale, PhD[4] and **Jennifer Elston Lafata, PhD**[3], (1)Henry Ford Health System, Detroit, MI, (2)Case Western Reserve University, Cleveland, OH, (3)Virginia Commonwealth University, Richmond, VA, (4)Palo Alto Medical Foundation Research Institute, Mountain View, CA*

Purpose: Delivery of preventive services falls short of guideline recommendations. We evaluate the multilevel factors associated with missed opportunities to deliver evidence-based preventive services during periodic health examinations (PHE).

Method: Physician subjects (N=64) were general internal medicine and family physicians practicing in 2007-2009 with an integrated delivery system in southeast Michigan. Patient subjects (N=484) were insured, aged 50-80 years, and due for colorectal cancer screening. Office visit audio-recordings were used to ascertain physician recommendation for/delivery of 19 services recommended by the US Preventive Services Task Force and Advisory Committee on Immunization Practices. A patient survey and claims data were used to determine patient service eligibility/due status. Alternating logistic regression with individual service delivery as the outcome evaluated patient, physician, visit and contextual factors associated with missed

opportunities. Models nested services within patients and patients within physicians as well as controlled for service type.

Result: Among N=2662 services for which patients were due, 46% were not delivered. Services with highest rates of missed opportunities included aspirin counseling (82%), vision screening (81%) and influenza vaccination (80%). Those with lowest rates included colorectal cancer (7%) hypertension (8%) and breast cancer (10%) screening. Regression results indicated the likelihood of a missed opportunity increased with patient age (OR=1.03; 95% CI= 1.01-1.05) and each additional concern the patient raised (1.24; 1.09-1.40), decreased with increasing patient body mass index (0.98; 0.97-1.00) and each additional minute after scheduled appointment time the physician first presented (0.99; 0.98-1.00), and was greater if the physician used the electronic medical record (EMR) in the exam room (1.40; 1.06-1.86), was of a different gender than the patient (1.37; 1.05-1.79), and had seen the patient in the past 12 months (1.40; 1.06-1.86).

Conclusion: Almost half of recommended preventive services are not delivered to patients during PHEs. A combination of patient, physician, visit and contextual factors are associated with missed opportunities. While physicians appear not to skip delivery of due services when running late, delivery can be compromised when patients raise competing demands, and when the EMR is used in the exam room. The public health and economic impact of missed opportunities to deliver preventive services is profound and warrants additional studies to understand the complex interplay of factors that support and compromise preventive service delivery.

O. METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

10:15 AM - 11:45 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Session Chairs:

- *Kevin D. Frick, PhD*
- *Elbert S. Huang, MD, MPH*

Session Summary:

10:15 AM - 10:30 AM

O-1. YOU CAN'T GET HERE FROM THERE: METHODS FOR COST CONVERSION BETWEEN HEALTH CARE SYSTEMS NEED TO BE REEXAMINED

10:30 AM - 10:45 AM

O-2. DIFFERENCES BETWEEN MICRO-COSTING AND IMPLEMENTATION COSTS: EXAMPLE OF HIV RAPID TESTING AND COUNSELING IN A SUBSTANCE ABUSE TREATMENT PROGRAM

10:45 AM - 11:00 AM

O-3. SYSTEMATIZING THE USE OF VALUE OF INFORMATION ANALYSIS FOR PRIORITIZING SYSTEMATIC REVIEWS

11:00 AM - 11:15 AM

O-4. POPULATION SCREENING TRADE OFFS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF SCREENING ASYMPTOMATIC CHILDREN FOR CARDIAC DISORDERS THAT CAUSE SUDDEN CARDIAC DEATH

11:15 AM - 11:30 AM

O-5. USING LARGE ADMINISTRATIVE DATASETS AND CHART REVIEWS TO ESTIMATE COSTS FOR HEALTH STATES: THE CASE OF PROSTATE CANCER

11:30 AM - 11:45 AM

O-6. EXPLOITING LARGE OBSERVATIONAL DATA SETS FOR COMPARATIVE EFFECTIVENESS RESEARCH: THE EXAMPLE OF HIP REPLACEMENT

Abstracts:

O-1. YOU CAN'T GET HERE FROM THERE: METHODS FOR COST CONVERSION BETWEEN HEALTH CARE SYSTEMS NEED TO BE REEXAMINED

10:15 AM - 10:30 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

William Witteman, MISt[1], Holly O. Witteman, PhD[2] and Mike Paulden, MA., MSc.[1], (1)University of Toronto, Toronto, ON, Canada, (2)University of Michigan, Ann Arbor, MI

Purpose: When using health care costs, it is common practice to apply costing data from one time point in one country to another time point in another country. This requires converting across currencies, health care systems, and time. The conventional recommendation is to first convert to the desired currency using purchasing power parity, then adjust for inflation using the local context to determine the rate of adjustment [1]. However, this recommendation was based on untested assumptions that may not consistently hold. This study aims to demonstrate the implications of using different methods for converting health care costs between countries and across time. [1] Drummond et al. Issues in the cross-national assessment of health technology. Int J Technol Assess Health Care. 1992;8(4):671-82.

Methods: Using a preliminary convenience sample of nine common drugs, we extracted costing data for 2006 and 2009 from the drug formularies for the Ontario Drug Benefit Program and the United Kingdom

National Health Service. We examined differences in accuracy (defined as percent error between calculated and actual cost) for two different possible conversion routes: 1) convert currency, then inflate or 2) inflate, then convert currency, crossed with two different currency exchange mechanisms: a) purchasing power parity or b) exchange on currency markets. This yields four different possible conversion methods: 1a (recommended method as per [1]), 1b, 2a and 2b.

Results: Even in this very small sample, there were significant differences in accuracy for the four different conversion methods, whether calculating Ontario costs from NHS data ($F(1,8)=14.16$, $p=.006$) or NHS costs from Ontario data ($F(1,8)=75.94$, $p<.001$). Across drugs and methods, Ontario costs were underestimated by up to 47% and overestimated by up to 249%. UK costs were never underestimated and were overestimated by as much as 578%. Best accuracy for Ontario came from methods 2b (2 drugs) and 1b (7 drugs). Best accuracy for calculating UK costs was achieved with method 2b for all drugs. The recommended method (1a) yielded results that differed from the most accurate method for a given drug by up to 73%.

Conclusions: Differences in methods for cost conversion lead to vastly different results. Within this sample, the currently recommended method never yielded the most accurate results.

O-2. DIFFERENCES BETWEEN MICRO-COSTING AND IMPLEMENTATION COSTS: EXAMPLE OF HIV RAPID TESTING AND COUNSELING IN A SUBSTANCE ABUSE TREATMENT PROGRAM

10:30 AM - 10:45 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

Jared A. Leff, MS[1], Ashley A. Eggman, MS[1], Louise F. Haynes, MSW[2], Beverly E. Holmes, MSW[3], Jeffrey E. Korte, PhD[4], Lauren Gooden, MPH[5], Daniel J. Feaster, PhD[5], Lisa R. Metsch, PhD[5], Grant N. Colfax, PhD[6] and Bruce R. Schackman, PhD[1], (1)Weill Cornell Medical College, New York, NY, (2)Medical University of South Carolina, Charleston, SC, (3)Lexington Richland Alcohol and Drug Abuse Council, Columbia, SC, (4)Medical University of South Carolina, Columbia, SC, (5)Miller School of Medicine, Miami, FL, (6)San Francisco Department of Public Health, San Francisco, CA

Purpose: Micro-costing is often conducted to determine incremental costs of an intervention for cost-effectiveness analysis, but may not be consistent with budgetary costs used for implementation. We describe these differences using a case study of implementation of rapid HIV testing and counseling in a substance abuse treatment program following a clinical trial.

Method: During the clinical trial, we used micro-costing methods to determine the cost of HIV testing in substance abuse treatment programs to conduct a cost-effectiveness analysis. Time and materials were from study records (including start and stop times for time conducting on-site testing and counseling) and site interviews; labor costs assume full capacity and were valued at local labor rates; and overhead was calculated from site financial records and applied as a percentage of labor costs. Costs include counselor and other labor, rapid HIV test and materials, supervision, quality control, and overhead. After the trial, one site implemented on-site rapid HIV testing with risk-reduction counseling in its detoxification program for 30 weeks. We compared projected costs in 2009 US dollars of implementation at this site based on micro-costing to budgetary costs reported by the site.

Result: The site administered 184 rapid HIV tests during the implementation period. Projected total costs for this period using micro-costing were $13,900 versus $20,300 budgetary costs. Labor costs based on micro-

costing were $5,500 (245 hours) versus $16,700 (784 hours) budgeted for staff assigned to implementation. Overhead based on micro-costing was $5,500 versus $3,500 budgeted. Costs of tests and counseling supplies were estimated at $2,200 using micro-costing, whereas in the implementation the tests and supplies were provided from public health sources without cost to the site. Quality assurance costs using micro-costing were $700 but these costs were not separately budgeted in the implementation.

Conclusion: Cost estimates developed for cost-effectiveness analysis using micro-costing should not be indiscriminately applied when planning for implementation. Micro-costing may underestimate some costs (e.g. by assuming full capacity labor utilization) and overestimate others (e.g. by not considering donated materials and services). Micro-costing, however, may also identify cost categories not fully covered by implementation budgets (e.g. overhead and quality assurance).

O-3. SYSTEMATIZING THE USE OF VALUE OF INFORMATION ANALYSIS FOR PRIORITIZING SYSTEMATIC REVIEWS

10:45 AM - 11:00 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

Ties Hoomans, PhD[1], *Justine Seidenfeld, BA[1], Anirban Basu, PhD[2] and David Owen Meltzer, MD, PhD[1], (1)University of Chicago, Chicago, IL, (2)University of Washington, Seattle, WA*

Purpose: This study explores how health technology assessment (HTA) and research-funding agencies might effectively and efficiently use value-of-information (VOI) analysis to inform priorities for systematic reviews.

Methods: We reviewed 1) priority setting processes used by 13 international HTA and research-funding agencies, and 2) methods applied in 75 VOI studies from the literature. Following this, we developed an algorithm for deciding about the most effective and efficient approach to analyzing the value of systematic reviews in specific contexts.

Results: Our review revealed that the use of VOI and modeling is rarely applied in prioritizing systematic reviews. We identified conditions under which four alternative VOI approaches may be used for this purpose. The construction of "maximal" models of a broad disease process – often including multiple interventions to screen, diagnose and treat patients - can be worthwhile for prioritizing reviews when topics cluster in particular domains, such as diabetes, heart disease, and prostate cancer. VOI analyses commonly involve full modeling of a disease and its treatment but such exercises are generally too complex and too costly for prioritizing systematic reviews. Modeling can be minimized when existing comparative effectiveness studies provide appropriate data on comprehensive measures of health outcomes. Another approach is "conceptual VOI", which uses information about the multiplicative elements of VOI, such as the burden of illness, uncertainty in treatment benefits, and the expected clinical use or implementation of research evidence, to provide informative bounds on the value of systematic reviews. Our algorithm describes a multi-stage process for deciding about the analysis of VOI in reviewing evidence. This process begins with clustering review topics and decisions about the use of maximal models, followed by conceptual VOI and then minimal modeling approaches. Although full models may aid in the planning and design of future research and HTA, we find limited conditions for the effective and efficient use of this traditional approach in prioritizing systematic reviews.

Conclusion: An algorithmic approach that includes maximal modeling, full modeling, minimal modeling and conceptual VOI analysis may be useful in informing priorities for systematic reviews. In future work, we will illustrate the application of the algorithm for prioritizing review topics nominated to the Agency for Healthcare Research and Quality (AHRQ) Evidence-based Practice Centers.

O-4. POPULATION SCREENING TRADE OFFS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF SCREENING ASYMPTOMATIC CHILDREN FOR CARDIAC DISORDERS THAT CAUSE SUDDEN CARDIAC DEATH

11:00 AM - 11:15 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

Angie Mae Rodday, MS[1], Laurel K. Leslie, MD, MPH[1], Joshua T. Cohen, PhD[1], John K. Triedman, MD[2], Mark E. Alexander, MD[2], Stanley Ip, MD[1], Jane W. Newburger, MD, MPH[2], Susan K. Parsons, MD, MRP[1], Thomas A. Trikalinos, MD, PhD[1] and **John B. Wong, MD[1]**, *(1)Tufts Medical Center, Boston, MA, (2)Children's Hospital Boston, Boston, MA*

Purpose: Highly publicized sudden cardiac deaths (SCD) in asymptomatic children and young adults have stimulated public interest in pre-athletics and school-based screening for asymptomatic cardiac disorders to avert these tragedies. However, the performance and trade-offs of the electrocardiogram (ECG) as a screening tool for the most common of these cardiac conditions is less understood.

Method: We systematically reviewed published literature on hypertrophic cardiomyopathy (HCM), long QT syndrome (LQTS), and Wolff-Parkinson-White syndrome (WPW), the three most common disorders associated with SCD and detectable by ECG. Using this information, we estimated (1) phenotypic prevalence, (2) sensitivity and specificity of ECG in detecting these disorders, (3) and predictive values using the illustrative point where sensitivity and specificity were equally weighted and the illustrative point where specificity was maximized.

Result: We identified and screened 6,954 abstracts, yielding 396 articles, and extracted data from 30. Summary prevalence estimates per 100,000 asymptomatic children were low at 45 (95% CI: 10, 79) for HCM; 7 (95% CI: 0, 14) for LQTS; and 136 (95% CI: 55, 218) for WPW. The areas under the receiver operating characteristic (ROC) curves for ECG were 0.91 for detecting HCM and 0.92 for LQTS. When sensitivity and specificity were weighted equally, the positive predictive value (PPV) of detecting either HCM or LQTS using ECG was less than 1%, there were many false positives per case detected (399 for HCM and 2,323 for LQTS), and the false negative rate was 15% for HCM and LQTS. However, when specificity was maximized, the PPV increased to 2% for HCM and 1% for LQTS, the false positives per case detected declined (57 for HCM and 135 for LQTS), as did the false negative rate (<1% for HCM and LQTS). Regardless of sensitivity and specificity cut-point, the negative predictive value (NPV) was near 100% and the false reassurance rate was low (<45 per 100,000 screened) for HCM and LQTS.

Conclusion: Because HCM, LQTS, and WPW have very low prevalence rates, population screening with ECG would yield substantial false positives. Guidelines regarding ECG screening will need to balance trade-offs between identification and treatment of affected individuals against the additional costs and risks associated with post-screening cardiac evaluations to rule out these disorders as well as potential overdiagnosis and overtreatment of asymptomatic individuals.

O-5. USING LARGE ADMINISTRATIVE DATASETS AND CHART REVIEWS TO ESTIMATE COSTS FOR HEALTH STATES: THE CASE OF PROSTATE CANCER

11:15 AM - 11:30 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)
Part of Session: METHODS FOR COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS RESEARCH

***Murray D. Krahn, MD, MSc**[1], Karen E. Bremner, BSc[2], Brandon Zagorski, MSc[3], Shabbir MH Alibhai, MD, MSc[2], George Tomlinson, PhD[1] and Gary Naglie, MD[4], (1)University of Toronto, Toronto, ON, Canada, (2)University Health Network, Toronto, ON, Canada, (3)Institute for Clinical Evaluative Sciences, Toronto, ON, Canada, (4)Baycrest, Toronto, ON, Canada*

Purpose: To obtain population-based estimates of direct healthcare costs for prostate cancer (PC) from diagnosis to death for health states in a state-transition model.

Method: PC patients, diagnosed in 1993, 1994, 1997, 1998, 2001, and 2002, and residing in three regions of Ontario, Canada, were selected from the Ontario Cancer Registry. We retrieved pathology reports to identify patient name, referring physician, and tumour information. With consent from referring physicians, we contacted patients and family of dead patients for consent to review charts. We visited physicians' clinics and hospitals and reviewed charts to obtain data describing PC diagnosis, treatment, and outcome. We developed clinical criteria to allocate each patient's observation time to 11 PC-specific Markov health states, including active surveillance, treatments, follow-up, recurrence, metastases, and death. We linked these data to health care administrative databases to calculate healthcare resource use and costs per health state, using previously developed costing methods. Mixed model multivariable regression determined predictors of costs. To assess model validity, we compared predicted costs estimated from the model with actual costs using the root mean square error and mean average error.

Result: The final sample numbered 829 patients (mean age = 67 years). Over 50% had T2 to T4 disease, and 5% were metastatic at diagnosis. The most costly primary treatment was radical prostatectomy ($4,702 per 100 days). The least costly health state was post-prostatectomy ($731 per 100 days). Costs before death and for hormone-refractory metastatic disease were high at $11,008 and $6,324 per 100 days, respectively. Costs increased with age (p<0.001), comorbidity (p<0.001), and advanced PC at diagnosis (p<0.05). Radical prostatectomy, metastatic disease, and final (pre-death) health states were significantly more costly than active surveillance (p<0.05), while post-prostatectomy and post-radiation therapy states cost significantly less (p<0.0001). The validity of the model was assessed; the root mean square error was $4,206 and mean average error was $1,873, relatively small compared with observed mean and median costs per 100 days, $4,344 and $2,338, respectively.

Conclusion: Combining chart reviews and administrative data is feasible to estimate mean adjusted costs and the effects of covariates on costs for state-transition models. However, this approach is very costly and time consuming. Administrative data alone may be sufficient for applications that do not require a high level of clinical detail.

O-6. EXPLOITING LARGE OBSERVATIONAL DATA SETS FOR COMPARATIVE EFFECTIVENESS RESEARCH: THE EXAMPLE OF HIP REPLACEMENT

11:30 AM - 11:45 AM: Wed. Oct 26, 2011
Columbus Hall C-F (Hyatt Regency Chicago)

***Mark W. Pennington, PhD**, Jan Van der Meulen, PhD and Richard Grieve, PhD, London School of Hygiene & Tropical Medicine, London, United Kingdom*

Purpose: Recent research has highlighted the importance of subgroup analysis to facilitate the use of comparative effectiveness research in shared decision making (Basu, MDM, 2009). Obtaining sufficient data for such analyses may require the use of large observational data sets, particularly where adverse events/failures are rare or occur over extended time periods. Potential pitfalls can still arise when examining small differences across subgroups. We illustrate these issues, in the context of a high-profile example, prosthesis selection for primary total hip replacement (THR). Here decision-makers require cost-effectiveness results for pre-defined age and gender groups.

Method: A Markov model of THR was populated with data from three large databases to compare the cost-effectiveness of cemented, uncemented and hybrid prostheses. Patient reported outcomes on THR are now routinely collected in England providing Generic (EQ5D) and condition specific QoL data before and after THR (n = 10,000). Data on prosthesis survival was taken from the National Joint Register (NJR) of England and Wales (n=217,000) and THR admissions data for English National Health Service Hospitals (HES) (n=457,000). Ordinary least squares regression analysis was used to report QoL following THR with each prosthesis type, for different patient subgroups, adjusting for baseline differences. Alternative model specifications were considered using measures of model fit such as AIC. Combination of data from HES and NJR allowed a semi-parametric consideration of prosthesis survival up to ten years with parametric extrapolation beyond ten years by patient subgroup.

Result: Across the age range considered (60 to 80), cemented prostheses were cheaper and offer superior survival, but hybrid prostheses provide larger gains in QoL. The regression results suggest that the relative gains in QoL for hybrid prostheses may be greater for younger patients. After inclusion of subgroup interactions cemented prostheses dominate hybrid and uncemented prostheses for eighty year olds. Hybrid prostheses are the most cost-effective alternative for sixty and seventy year olds (at λ=£20,000 per QALY the incremental net benefit for females age 70 are: uncemented, £181,000; cemented, £183,000; hybrid £184,000).

Conclusion: Large observational databases can allow crucial parameters in CEA models such as QoL and survival gains to be estimated both overall and for subgroups of high policy interest. This can help both providers and patients make more informed choices about competing alternatives.

Sunday, October 23, 2011 (Posters)

SMDM POSTER SESSION 1

6:30 PM - 8:30 PM: Sun. Oct 23, 2011
Grand Ballroom AB (Hyatt Regency Chicago)

Session Summary:

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1. THE VALUE OF MALE HPV VACCINATION IN PREVENTING CERVICAL CANCER IN SOUTH VIETNAM

2. PEDIATRIC HODGKIN'S DISEASE: TRADEOFFS BETWEEN SHORT AND LONG-TERM MORTALITY RISKS

3. THE INFLUENCE OF PATIENT/PROVIDER BEHAVIOR ON THE VALUE OF ERCC1 TESTING RESEARCH IN STAGE II NON-SMALL CELL LUNG CANCER

4. A COST-UTILITY ANALYSIS COMPARING CONTINUOUS POSITIVE AIRWAY PRESSURE, ORAL APPLIANCE, AND SURGERY WHEN TREATING MODERATE OBSTRACTIVE SLEEP APNEA IN MIDDLE-AGED CANADIAN MALES

5. OPTIMIZATION OF FOLLOW-UP SCENARIOS FOLLOWING BREAST CANCER

6. EDUCATIONAL INEQUALITIES IN HPV VACCINE ACCESS AND UTILIZATION: THE RELATIVE ROLES OF ECONOMICS AND AWARENESS

7. DEFINING POLICY DECISION(S) AND INTEGRATING CONTEXTUAL EVIDENCE: A MULTIPLE CASE STUDY OF COLORECTAL CANCER SCREENING POLICY DEVELOPMENT

8. HEALTH CARE COMMISSIONING IN THE ENGLISH NHS: EVIDENCE, CO-PRODUCTION AND QUALITY OF DECISIONS

9. POTENTIAL BENEFITS OF SECOND-GENERATION VACCINES AGAINST HUMAN PAPILLOMAVIRUS (HPV)

10. IS A BIRD IN THE HAND WORTH MORE THAN THREE IN THE BUSH? THE COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS OF CONJUGATE PNEUMOCOCCAL VACCINE PROGRAM OPTIONS IN ONTARIO, CANADA

11. COST-EFFECTIVENESS OF A HYPOTHETICAL INTERVENTION TO IMPROVE PHYSICIAN COMPLIANCE WITH TRAUMA TRIAGE GUIDELINES

23. RATIONAL DECISION MAKING REVISITED: INSIGHTS FROM STUDYING INDIVIDUAL HEALTHCARE FUNDING DECISIONS IN ENGLAND

24. GAZING INTO THE MS CRYSTAL BALL: A NOVEL PREDICTIVE TECHNIQUE FOR IDENTIFYING MS NON-ADHERENCE

25. WITHDRAWN - A SYSTEMATIC REVIEW OF ADVANCED LUNG CANCER AND ITS ECONOMIC BURDEN

26. A DISCRETE-EVENT SIMULATION MODEL TO EVALUATE COST-EFFECTIVENESS OF SMOKING CESSATION TREATMENTS

27. CORONARY COMPUTED TOMOGRAPHY VERSUS EXERCISE TESTING IN PATIENTS WITH STABLE CHEST PAIN: COMPARATIVE EFFECTIVENESS AND COSTS

28. DECISION MAKING BIASES IN JUDGMENTS ABOUT VASCULAR RISK FACTORS

29. HEALTHY FOOD CHOICES: THE ROLE OF FRONT OF PACK NUTRITIONAL LABELLING FORMAT

30. VALUE CLARIFICATION IN DECISION AIDS: A MISSING ELEMENT?

31. GROUP CLUSTERING OF DCE-ELICITED PREFERENCES PREDICTS ADHERENCE TO ASTHMA PREVENTER MEDICATION

32. INVESTIGATING THE ROLE OF RISK PERCEPTIONS IN PREDICTING PROSTATE CANCER SCREENING BEHAVIOUR AS A FUNCTION OF FAMILY HISTORY: THE CONTRIBUTION OF AVAILABILITY AND REPRESENTATIVENESS HEURISTICS

33. PATIENT PRIORITIES REGARDING CURRENTLY RECOMMENDED COLORECTAL CANCER SCREENING OPTIONS

34. ATTITUDES TOWARDS MODE OF DELIVERY CHOICE AMONG A DIVERSE POPULATION OF PREGNANT WOMEN

46. THE IMPACT OF SUBJECTIVE LIFE EXPECTANCY ON HEALTH STATE VALUATION WITH THE TIME TRADE-OFF METHOD

47. THE DEVELOPMENT OF A DECISION-AID TO GUIDE COUNSELING OF PARENTS FACING IMMINENT EXTREME PREMATURE DELIVERY

48. DOES DIAGNOSIS MATTER IN END-OF-LIFE DECISION MAKING IN THE HOSPITAL?

49. "DON'T KNOW" RESPONSES TO RISK PERCEPTION MEASURES: IMPLICATIONS FOR UNDERSERVED POPULATIONS

50. THE IMPORTANCE OF INTERACTIONS IN DETERMINING HOW COMMUNITY PRACTITIONERS DIAGNOSE AND TREAT ACUTE RESPIRATORY TRACT INFECTIONS

51. WITHDRAWN- NEUROTICISM IS ASSOCIATED WITH SELF-RATED HEALTH ON THE EQ-5D

52. WITHDRAWN - CONCRETENESS AND SIMPLICITY EXPLAIN THE EFFECT OF NUMERICAL AND GRAPHICAL RISK FORMATS ON PERCEIVED LIKELIHOOD AND CHOICE

53. SOURCES OF CONFLICTING MEDICATION INFORMATION: ASSOCIATIONS WITH DEMOGRAPHIC FACTORS AND MEDICATION ADHERENCE

54. BMI, CANCER RISK PERCEPTION, AND PREVENTIVE BELIEFS

55. THE EFFECT OF DIFFERENT PROPENSITY REGRESSION TECHNIQUES ON PREDICTIVE ACCURACY IN COMPARATIVE EFFECTIVENESS RESEARCH

56. DETERMINING THE MOST INFORMATIVE MAMMOGRAPHIC FEATURES IN BREAST CANCER DIAGNOSIS BY MULTIDIMENSIONAL MUTUAL INFORMATION ANALYSIS AND BAYESIAN REASONING

57. WINTDRAWN - A NOVEL JOINT HEALTH-STATE TARIFF-VALUE PREDICTOR BASED ON UNITS OF MORBIDITY

58. MICROSIMULATION AND CALIBRATION METHODS ACCOUNTING FOR OBESITY AND UNDERWEIGHT-RELATED HEALTH IN COUNTRIES LIKE INDIA

59. AGENT-BASED APPROACH TO CONTACT PATTERNS MODELLING

Grand Ballroom AB (Hyatt Regency Chicago)

1. THE VALUE OF MALE HPV VACCINATION IN PREVENTING CERVICAL CANCER IN SOUTH VIETNAM (ESP)

Monisha Sharma, ScM, *Stephen Sy, BS and Jane J. Kim, PhD, Harvard School of Public Health, Boston, MA*

Purpose: Cervical cancer, caused by sexually-transmitted human papillomavirus (HPV) infections, is the most common form of cancer among women in South Vietnam. We sought to evaluate the additional health benefits and incremental cost-effectiveness of including boys in an HPV vaccination program of girls in South Vietnam.

Methods: Sexual transmission of HPV-16 and -18, two of the most common types that cause cervical cancer, was simulated using a dynamic model that was calibrated to the setting of South Vietnam, using epidemiological data on cervical cancer incidence and HPV-16, -18 prevalence, country-specific population statistics, and survey data on heterosexual behavior, including male visits to female sex workers. Predictions of HPV incidence reduction from the model, including direct and indirect (herd immunity) benefits under various scenarios of vaccination, were used as inputs into a first-order Monte Carlo simulation model of HPV and cervical carcinogenesis, which was also calibrated to South Vietnam. Strategies included vaccination of pre-adolescent girls and boys compared with vaccination of girls alone under varied assumptions of vaccine uptake (25%-95%). We assumed vaccine efficacy against HPV-16,-18 infections was 100% for girls and 85% for boys over their lifetime. Sensitivity analyses were conducted on vaccine cost and sexual behavior, including number of sexual partners and mixing patterns in the population.

Results: Across the range of vaccination coverage levels, vaccinating girls alone consistently resulted in cost-effectiveness ratios less than Vietnam's per-capita GDP (I$2,682), provided vaccine costs were low (e.g., $10 per-vaccinated individual, or $2 per dose), indicating good value for money. Although including boys in the vaccination program resulted in higher benefits, the cost-effectiveness ratio exceeded per-capita GDP when the cost was $25 per-vaccinated individual or higher. For example, when vaccination coverage was 50%, vaccination of girls and boys cost over I$8,000 and I$12,000 per quality-adjusted life year (QALY) gained when vaccine cost was I$50 and I$75, respectively. Reducing the number of sexual partners had a larger impact on cost-effectiveness ratios than assuming less random mixing in the population, but results remained robust under varied assumptions of changes in sexual behavior.

Conclusions: The optimal target population for HPV vaccination in South Vietnam may not include boys unless HPV vaccine costs are dramatically reduced.

2. PEDIATRIC HODGKIN'S DISEASE: TRADEOFFS BETWEEN SHORT AND LONG-TERM MORTALITY RISKS (ESP)

Jennifer M. Yeh, PhD, Harvard School of Public Health, Boston, MA and Lisa Diller, MD, Dana-Farber Cancer Institute, Boston, MA

Purpose: As survival rates for pediatric Hodgkin's disease (HD) approximate 90-100%, treatment decisions are increasingly based upon minimizing late-effects risk and late mortality. While more intensive HD treatment may lead to lower relapse rates, patients face higher risks of late-effects mortality, including second cancers. Yet less intensive treatment may compromise initial disease control. Using a model-based approach, we provide insight on trade-offs between short- and long-term mortality risks on overall survival.

Methods: We developed a state-transition model to simulate the lifetime clinical course of patients diagnosed with HD during childhood. We compared two general treatment strategies, chemotherapy alone and chemotherapy combined with radiation therapy (chemoradiotherapy). Relapses for both strategies were treated with salvage therapy. Data on (1) probability of relapse from original cancer, (2) late-recurrence mortality, (3) excess mortality from second cancer and cardiac late-effects, and (4) background mortality were estimated from published literature and databases. Outcomes included cause-specific mortality, cumulative mortality probability, conditional life expectancy, and proportion alive at age 50.

Results: For a cohort of HD patients diagnosed at age 15, conditional life expectancy was 57.2 years with chemotherapy alone compared to 56.4 years with chemoradiotherapy. The estimated lifetime HD mortality risk associated with chemotherapy alone was 3.6% versus 2.2% with chemoradiotherapy. In contrast, there was a lower risk of second cancers with chemotherapy alone (0.9%) compared with chemoradiotherapy (2.4%). Similarly, there was a lower risk of cardiac deaths with chemotherapy alone (0.9%) compared with chemoradiotherapy (5.0%). Among individuals alive at age 50, only 9.2% of those treated with chemotherapy alone were at risk for radiation-related late-effects (compared to 100% for chemoradiotherapy). Sensitivity analysis found that chemotherapy alone was the preferred strategy unless its probability of relapse was 40% higher or the excess risk associated with radiation-related cardiac events for chemoradiotherapy was 60% lower. Probabilistic sensitivity analysis estimated that the probability that chemotherapy alone was associated with higher LE was 0.69, and for a shorter 25-year time horizon, 0.47.

Conclusions: Chemotherapy alone may lead to more favorable survival when both short- and long-term outcomes are considered, although outcomes for shorter time horizons are less certain. Omitting radiation as frontline therapy, as has become increasingly common in adults, should also be considered for pediatric HD patients.

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3. THE INFLUENCE OF PATIENT/PROVIDER BEHAVIOR ON THE VALUE OF ERCC1 TESTING RESEARCH IN STAGE II NON-SMALL CELL LUNG CANCER (ESP)

Joshua A. Roth, MHA[1], Josh J. Carlson, PhD[1], Lotte Steuten, PhD[2], Scott Ramsey, MD, PhD[3] and David L. Veenstra, PharmD, PhD[1], (1)University of Washington, Seattle, WA, (2)University of Twente, AE Enschede, Netherlands, (3)Fred Hutchinson Cancer Research Center/ University of Washington, Seattle, WA

Purpose: To assess the value of research for *ERCC1* expression testing to inform adjuvant chemotherapy decisions in resected Stage II non-small cell lung cancer (NSCLC), given substantial uncertainty about chemotherapy decisions informed by *ERCC1* test results.

Method: We developed a decision-analytic model to estimate the expected value of perfect information (EVPI), perfect parameter information (EVPPI), sample information (EVSI), and sample parameter

information (EVSPI) for two treatment strategies: 1) *ERCC1* testing to inform adjuvant chemotherapy decisions, with *ERCC1+* patients indicated to receive no chemotherapy and *ERCC1-* patients indicated to receive chemotherapy; 2) standard care, with all patients indicated to receive chemotherapy. Thirty percent (range, 10-50%) of *ERCC1+* patients were assumed to not follow test results and choose to receive chemotherapy, and 10% (range 5-15%) of *ERCC1-* patients were assumed to not follow test results and choose to not receive chemotherapy. Model parameters and uncertainty ranges were derived from the International Adjuvant Lung Cancer Trial, published literature, and government sources. SEER data were used to calculate the affected population over a 10-year time horizon. A willingness-to-pay threshold of $150,000/QALY was utilized in the base-case.

Result: The *ERCC1* strategy produced greater net-benefit than standard care in 55% of simulations and the average consequence of selecting the wrong strategy was $7,400. The EVPI for an affected population of 322,400 was $1.07 B. The EVSI for a trial examining all model parameters with sample sizes of 100, 500, and 1,000 patients per arm was $81 M, $847 M, and $1.01 B, respectively. The EVPPI for the chemotherapy utilization behavior parameters was $353 M, and $107 M and $237 M was attributable to ERCC1+ and ERCC1- sub-groups, respectively. The EVSPI for a study examining *ERCC1+* and *ERCC1-* chemotherapy utilization behavior was $74 M and $138 M for a sample of 100 patients, and approximately $107 M and $237 M at sample sizes of both 500 and 1,000.

Conclusion: The value of research greatly exceeded the expected cost of an *ERCC1* testing trial, and EVPPI and EVSPI estimates demonstrated the influence of patient/provider behavior on the value of *ERCC1* research. These findings demonstrate the overall value of *ERCC1* research in NSCLC, identify chemotherapy decision-making as a high value research area, and can assist stakeholders in prioritizing funding for *ERCC1* research relative to alternative investments.

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4. A COST-UTILITY ANALYSIS COMPARING CONTINUOUS POSITIVE AIRWAY PRESSURE, ORAL APPLIANCE, AND SURGERY WHEN TREATING MODERATE OBSTRACTIVE SLEEP APNEA IN MIDDLE-AGED CANADIAN MALES (ESP)

George Tomlinson, PhD[1], Tetyana B. Kendzerska, MD, MSc[1], Natasha Nanwa, MSc[1], Robert A. Fowler, MD, MSc[2] and Colin Shapiro, MD, PhD[1], (1)University of Toronto, Toronto, ON, Canada, (2)Sunnybrook Health Sciences Center, Toronto, ON, Canada

Purpose: Continuous positive airway pressure (CPAP) is the recommended first line treatment in obstructive sleep apnea (OSA); however, other treatment options could be considered. The objective of this study was to compare the health and economic outcomes related to CPAP, oral appliances, and surgery such as uvulopalatopharyngoplasty (UPPP) and maxillomandibular advancement (MMA) when managing OSA.

Method: A cost-utility analysis was conducted. A decision tree and Markov cohort model simulated the outcomes and costs of treatment options based on their effects on motor vehicle and workplace injuries, cardiovascular events and all-cause mortality rates. The base case was a 45 year old Canadian male patient with moderate OSA, who operated a motor vehicle, was employed, and had no significant co-morbidities aside from OSA. Costs out probabilities, utilities and costs were obtained from systematic searches of the medical literature. Baseline CPAP compliance (defined as using CPAP machine more than 4 hours per night, and more than 5 nights per week) was estimated at 50%. Outcomes measured were quality adjusted life years (QALYs), costs, and incremental cost-effectiveness ratios (ICERs). Patients were followed for their expected lifetime and outcomes were discounted at 3% per year. We adopted a Canadian insurer perspective.

Result: The cost-effectiveness of various strategies to treat OSA is critically dependent upon compliance with CPAP, effectiveness of oral appliances treatment and cost of UPPP surgery. Only at compliance rates

≥90% CPAP as the dominant therapy is the most effective (13.3 QALYs) and least costly ($14,190) option. However, at CPAP compliance rates below 67%, UPPP becomes the most cost-effective first strategy (ICER = $1,473/QALY gained in comparison to CPAP). Oral appliances are only cost-effective when both CPAP compliance is poor (< 50%), and UPPP surgical success rate is poor (<64%), and oral appliance success rate is more than 61%, with and ICER = $1,500/QALY gained in comparison to surgery.

Conclusion: Cost-effectiveness of strategies to treat moderate OSA in middle-age Canadian males without significant co-morbidities is critically dependent upon CPAP compliance, as surgery becomes the preferred strategy when compliance with CPAP (using CPAP machine more than 4 hours per night, and more than 5 nights per week) is less than> 90%.

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5. OPTIMIZATION OF FOLLOW-UP SCENARIOS FOLLOWING BREAST CANCER (ESP)

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Purpose: Breast cancer occurs in about one in nine women in the Netherlands. Every year, 11,000 new cases are registered and about 3,500 women die of breast cancer. Prognosis after primary treatment is improving, leading to an increased number of follow-up visits and increasing workload to physicians. National guidelines currently assign all these patients the same follow-up programme: twice a year for five years. The present study was undertaken to determine an individualised follow-up programme that gives women the follow-up they need and reduces physician workload.

Methods: Breast cancer patients were classified according to different risk groups for recurrence based on age, tumour size and lymph node status. We chose follow-up programmes with different frequency and length. To determine the most appropriate follow-up programme for each patient group we modelled the process of breast cancer in a state transition model, and used discrete event simulation to investigate the effectiveness of various follow-up programmes. Follow-up programmes are compared based on the number of visits and quality adjusted life expectancy. We simulated 150,000 patients per patient group and follow-up programme.

Result: For patients older than 70 years and patients with favourable tumour characteristics follow-up could be minimised to one visit. Patients younger than 40 years and patients with unfavourable tumour characteristics can benefit from a more intensive follow-up of twice a year for five years. Overall a reduction of 70% of needed follow-up visits can be quickly achieved.

Conclusion: The present study illustrates the potential for individualised follow-up in breast cancer patients. Implementing individualised follow-up can lead to a reduction of number of follow-up visits needed.

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6. EDUCATIONAL INEQUALITIES IN HPV VACCINE ACCESS AND UTILIZATION: THE RELATIVE ROLES OF ECONOMICS AND AWARENESS (ESP)

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Purpose: This study examines possible explanations for the relationship between maternal education and Human Papillomavirus (HPV) vaccine receipt and decomposes the gap between high and low education groups. I estimate the significance of different channels through which maternal education can affect the

probability of receiving doses of the HPV Vaccine. The HPV vaccine is not part of the standard vaccination series provided during early childhood and is less likely to be attached to school entry requirements. Therefore, compared to other more universally received childhood vaccines, the decision to vaccinate for HPV may have a greater association with factors related to parent education, including vaccine awareness, income, and health insurance status.

Method: Using NIS-Teen survey data from 2007 to 2009, a total of 19,603 adolescent girls between 13 and 17 years of age are included in the study. participants are divided into high and low education groups according to the education level of the mother. The gap between the two groups is decomposed to its determinants using the Blinder-Oaxaca method.

Result: HPV Vaccine up-to-date status, defined as receipt of one or more shots prior to the survey date, is 43.2% and 37.5% in the high and low education groups, respectively. Vaccine knowledge and awareness are the major factors in the decomposition model, contributing to 31.5% of the gap. Factors related to healthcare access, including insurance and health facility type, do not contribute to the gap. Results indicate that adolescents with lower incomes and public insurance plans are actually more likely to receive the HPV vaccine. This is perhaps due to 100% coverage of the HPV vaccine through the Vaccines for Children program (VFC), which targets low-income families.

Conclusion: This study empirically tests established theories linking parent education and health behaviors for adolescents. Findings suggest that the influence of maternal education on vaccine use is not entirely explained by income and healthcare access. Simply reducing the cost of vaccines or improving insurance coverage may not be enough to reduce educational disparities. The decision to vaccinate for HPV may have a greater association with non-economic factors related to parent education than previously thought. Specifically, health knowledge and awareness may be significant contributors to educational disparities.

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7. DEFINING POLICY DECISION(S) AND INTEGRATING CONTEXTUAL EVIDENCE: A MULTIPLE CASE STUDY OF COLORECTAL CANCER SCREENING POLICY DEVELOPMENT (ESP)

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Purpose: Colorectal cancer (CRC) screening policy is complex, dynamic and multi-factorial. There are many potential screening modalities with new options emerging, however with only a handful of randomized controlled trials supporting the effectiveness of the fecal occult blood test, and more recently, flexible sigmoidoscopy, the principal scientific evidence base is slow to evolve. Despite this, CRC screening programs vary widely across different jurisdictions. Building on past work, the study's purpose was to compare/contrast CRC screening policy processes in five Canadian provinces regarding (1) what constituted the formal policy decision and (2) how contextual evidence was used.

Method: A multiple case study design was employed with cases representing the policy-making processes in the five provinces (four provinces made major CRC screening policy announcements in 2007 while the fifth made recommendations in 2008). Key informant interviews and document analysis were the primary methods used. A purposive sample of clinical leaders, screening experts, administrative leaders and government officials were invited to participate. Documents sought included policy reports/announcements, planning documents, expert group guidance, and media reports. Interview data were transcribed and coded using NVivo qualitative analysis software.

Result: Considerable efforts were made to unpack what constituted a 'policy-go' decision, among many other important decisions in the process to establish a population-based CRC screening program in each

province. Formal policy announcements varied in terms of funding approaches/commitment, program comprehensiveness, and implementation timeline. Several issues dominated policy deliberations, including optimal screening modality, clinical/laboratory infrastructure capacity, programmatic approach (e.g., public health vs. primary care), quality assurance methods and budget impact. Although scientific evidence is lacking for many of these key issues, particularly as focus shifts from effectiveness to implementation issues, the five cases varied widely in terms of their approach and/or use of contextual evidence. Some cases exhibited formal and strategic approaches to developing local contextual evidence to support their policy decisions, while other cases preferred to rely almost solely on externally derived evidence.

Conclusion: Population-based health policy decisions are complex, multi-factorial, dynamic and context-dependent. While the scientific evidence base often provides the impetus to initiate major policy decisions, the notable lack of structured approaches or guidance for integrating contextual evidence to support key aspects of these decisions makes them decidedly less evidence-informed than is optimal and needs to be addressed.

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8. HEALTH CARE COMMISSIONING IN THE ENGLISH NHS: EVIDENCE, CO-PRODUCTION AND QUALITY OF DECISIONS (ESP)

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Purpose: In England, local NHS commissioners plan, fund and review health services ranging from emergency to community-based care for a defined population. We aimed to investigate use of evidence, extent of co-production (collaboration and interaction between players in commissioning decisions) and factors associated with self-rated quality of decisions by local commissioners of health services.

Method: Cross sectional survey of decision making quality by a random sample of commissioners in England stratified to reflect population size and level of deprivation. Measures used: three measures of evidence/information use and influence - two previously validated, one designed de novo; two measures of quality of decisions - the Decisional Conflict Scale and the COMRADE scale (both adapted for use for organizational-level decision-making); one measure of co-production developed de novo. Demographic and job role data were collected alongside characteristics of the commissioning organization. Analysis was undertaken using backwards, stepwise, multiple linear regression.

Result: Two hundred and eighty commissioners from 11 representative organizations in England responded (77% response; 63% complete surveys). Twenty three per cent considered "available budget/cost savings" as the most influential factor on commissioning decisions with "evidence of effectiveness" the second most influential factor (11%). Regression analysis suggested that both perceived influence of evidence (of safety/quality, effectiveness and cost-effectiveness) and overall levels of co-production were associated with perceived decision quality. These factors in combination explained 14% of the variation in decision satisfaction. (Influence of evidence (standardised beta=0.24); co-production (standardised beta=0.21)).

Conclusion: Organizational decision making to plan services, and the uses of evidence are important in all health care systems. Perceived quality of commissioning decision-making for our respondents appeared to be affected both by extent of co-production and by the influence of evidence. We found no appropriate definitive measures of quality of decision making and used adapted individual clinical level decision quality tools. Large changes are planned in the English NHS, groups of family physicians are soon to take over running much of the budget (£65bn (62%)). They will need enhanced understanding of commissioning,

decision making and evidence. A squeeze in real terms is predicted and difficult decisions will be needed. The process is complex and our results suggest that that there will be important lessons for these new commissioners to learn.

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9. POTENTIAL BENEFITS OF SECOND-GENERATION VACCINES AGAINST HUMAN PAPILLOMAVIRUS (HPV) (ESP)

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Purpose: Current prophylactic vaccines against human papillomavirus (HPV) target two high-risk types (16 and 18) that contribute to roughly 70% of cervical cancer cases worldwide. Our objective was to quantify the range of additional benefits conferred by second-generation HPV prophylactic vaccines that are expected to include protection against five additional high-risk types (31, 33, 45, 52 and 58).

Method: A microsimulation model of HPV and cervical cancer calibrated to epidemiological data from two countries (Kenya and Uganda) was used to estimate the reductions in lifetime risk of cervical cancer from the second-generation HPV vaccines. We explored the absolute and relative importance of certain characteristics of the population (i.e., distribution of HPV types in cancer, the prominence of co-infection with multiple HPV types or unidentifiable HPV types, existence of a cervical cancer screening program) and the vaccine (i.e., cross-protective effects against non-targeted HPV types, vaccine uptake), and evaluated the comparative effectiveness of these future HPV vaccines against currently-available vaccines.

Result: Assuming no screening and complete uptake of the second-generation vaccine, reduction in lifetime cancer risk was 86.33% in Kenya and 91.83% in Uganda, representing an absolute increase in cervical cancer reduction of 26.13% in Kenya and 17.92% in Uganda, compared with complete uptake with the current vaccines. This increase in benefits rose to 29.10% in Kenya and 19.48% in Uganda when assuming the extreme case that cancers with co-infected and unidentifiable HPV types are attributable to one of the five new types covered in the second-generation vaccine. In contrast, when assuming cases with multiple HPV infections or unidentified types are not attributable to one of the five new types, additional absolute benefits in cancer prevention dropped to 19.60% in Kenya and 13.99% in Uganda. Allowing for vaccine cross-protection in both the current and second-generation vaccines, these effects were blunted in both countries. Vaccine uptake and screening 1-3 times per lifetime had relatively smaller effects on the added benefit of the second-generation vaccines.

Conclusion: Second-generation HPV vaccines that extend protection to additional HPV types have the potential to improve cervical cancer prevention. Multiple HPV infections and unidentifiable HPV types can influence vaccine effectiveness, but their impacts may be moderated by vaccine cross-protective effects. These benefits must be weighed against the cost of the vaccines in future analyses.

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10. IS A BIRD IN THE HAND WORTH MORE THAN THREE IN THE BUSH? THE COMPARATIVE EFFECTIVENESS AND COST-EFFECTIVENESS OF CONJUGATE PNEUMOCOCCAL VACCINE PROGRAM OPTIONS IN ONTARIO, CANADA (ESP)

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Purpose: To determine the effectiveness and cost-effectiveness of pediatric pneumococcal conjugate vaccine (PCV) program options, highlighting potential qualitative differences in valuing health outcomes.

Method: *Streptococcus pneumoniae* and nontypable *Haemophilus influenzae* (NTHi) infections cause substantial childhood disease: approximately 150 cases of invasive pneumococcal disease (IPD) and >150,000 cases of non-invasive disease (NID) annually in 2.2 million Ontario children <15 years. We developed a decision-analytic model to determine the effectiveness and cost-effectiveness of a 13-valent (PCV13) vaccine compared to a 10-valent (PCV10) vaccine. These protect against 13 and 10 *S. pneumoniae* serotypes, respectively. PCV10 may also protect against NTHi acute otitis media. Compared to PCV13, PCV10 use might result in smaller quality-adjusted life year (QALY) gains from preventing serious IPD, but in greater total QALY gains. We therefore examined three scenarios: 1) IPD only; 2) IPD and NID due to *S. pneumoniae;* and 3) IPD and NID due to *S. pneumonia* and NTHi. We estimated QALYs and costs during one year for children <15 years, assuming a steady-state situation. Parameter values were from laboratory surveillance data, health administrative data, and the literature. We based our vaccine price estimates on published Canadian PCV prices and allowed for bulk buying discounts, as procured vaccine prices are not publicly available.

Results: For IPD alone, PCV13 is more effective (62 QALYs gained) and more costly (C$3.5 Million) than PCV10, but cost-effective in the deterministic analysis (ICER <$120,000/QALY gained). For invasive and non-invasive *S. pneumonia* disease, PCV13 has the greatest benefit (188 QALYs gained) and is cost saving. However, the probability of PCV13 being cost-effective is low for both scenarios (<0.30), reflecting the high uncertainty of NID data. For all NID and IPD, the incremental benefit of PCV13 decreases to 31 QALYs gained, and it is no longer cost-effective. Sensitivity analysis confirmed the importance of both the underlying epidemiology and the price of PCV13 relative to PCV10. PCV13 is likely to be cost-effective if the vaccine price does not exceed the cost of PCV10 by more than C$3.

Conclusion: If valuing QALYs gained from invasive and non-invasive disease equally, PCV13 is likely to be cost-effective if the absolute price differential is small. However, due to the high level of uncertainty, further research to better describe the epidemiology of non-invasive disease is needed.

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11. COST-EFFECTIVENESS OF A HYPOTHETICAL INTERVENTION TO IMPROVE PHYSICIAN COMPLIANCE WITH TRAUMA TRIAGE GUIDELINES (ESP)

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Purpose: We used cost-effectiveness analysis to identify the best target for an intervention to improve physician compliance with guidelines that recommend the regionalization of moderately to severely injured trauma patients.

Method: Signal detection theory identifies two targets for interventions to improve decision making: decisional threshold (attitudes towards transferring patients to trauma centers) and perceptual sensitivity (ability to identify patients who meet triage guidelines). Changing decisional thresholds may be easier but increases the number of patients with minor injuries transferred to trauma centers. Changing perceptual sensitivity, which requires modifying heuristics, may be harder but more efficient. We constructed a decision model to compare the outcomes of patients taken initially to a non-trauma center with no intervention (e.g.,

given current compliance rates) to outcomes after a hypothetical intervention that either changed physicians' decision threshold or their perceptual sensitivity. We used the societal perspective and assumed that the cost of the hypothetical intervention would be no greater than current spending on Advanced Trauma Life Support certification programs (~$40/patient). We assumed that an intervention to change decisional thresholds would increase compliance by 40%, and the intervention to change perceptual sensitivity would be half as effective. We drew model inputs from the literature. We performed a series of one-way analyses for all variables and examined the most influential variables in a multi-variable sensitivity analysis using a Monte Carlo simulation.

Result: The incremental cost-effectiveness ratio (ICER) of an intervention to change perceptual sensitivity compared with no intervention was $64,449/quality-adjusted life year (QALY) saved. The ICER of an intervention to change decisional threshold compared with an intervention to change perceptual sensitivity was $108,668/QALY-saved. The intervention to change perceptual sensitivity remained more cost-effective as long as it was 2/5 as effective as the intervention to change the decisional threshold. The most significant drivers of the ICER were the cost of hospitalizing patients with moderate-severe injuries and the relative risk of dying after moderate-severe injuries at non-trauma centers compared with trauma centers. Probabilistic sensitivity analyses suggested that at a willingness-to-pay threshold of $100,000/QALY-saved the intervention to change perceptual sensitivity was the most cost-effective 48% of the time.

Conclusion: We found that an intervention to change physicians' perceptual sensitivity was likely to be the most cost-effective way of increasing compliance with trauma triage guidelines.

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12. COST-EFFECTIVENESS OF ADULT PNEUMOCOCCAL CONJUGATE VACCINATION IN 50-YEAR-OLDS (ESP)

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Purpose: The effectiveness and cost-effectiveness of 13-valent pneumococcal conjugate vaccine (PCV13) compared with the currently recommended 23-valent pneumococcal polysaccharide vaccine (PPSV) in adults is unclear. Adult PCV13 could prevent more disease than PPSV, if adult studies show (as shown in children) effectiveness against noninvasive pneumococcal pneumonia (NPP), the commonest cause of pneumococcal disease hospitalization; no consistent evidence of PPSV effectiveness against NPP exists. However, PCV13 covers fewer serotypes causing the more severe invasive pneumococcal disease (IPD), and future indirect effects from routine pediatric PCV13 use may further reduce its coverage among adults.

Methods: We used a Markov model to estimate the cost-effectiveness of pneumococcal vaccination strategies in 50-year-old cohorts over their lifetime. Strategies were chosen by a Delphi expert panel, who also estimated age- and comorbidity-specific vaccine effectiveness. Sources for parameters included CDC's Active Bacterial Core surveillance data, as well as National Health Interview Survey, National Hospital Discharge Survey, National Inpatient Sample, Framingham Study, and SEER data. We also projected changes in adult pneumococcal serotype epidemiology and disease rates due to indirect effects from childhood PCV13. Utilities were obtained from the literature. We took a societal perspective, discounting costs and effectiveness 3%/yr.

Results: In the base case, using observed age- and comorbidity-based PPSV uptake, PCV13 given as a substitute for PPSV in the current recommendations (i.e., vaccination at age 65 years and at younger ages if comorbidities are present) cost $28,900/QALY gained compared with no vaccination. PCV13 given routinely

at ages 50 and 65 years cost \$45,100/QALY compared with the PCV13 substituted in current recommendations strategy. A strategy of PCV13 at ages 50 and 65 then PPSV at age 75 gains 0.00002 more QALYs, costing \$496,000/QALY gained. Two other strategies were dominated. Results were robust in sensitivity analysis and alternative scenarios, except when PCV13 effectiveness against NPP was assumed to be low. Here, PPSV use as currently recommended was favored, costing \$34,600/QALY, and PCV13 substituted in current recommendations cost \$131,000/QALY gained.

Conclusions: The analysis supports vaccinating adults with PCV13 rather than PPSV, but is sensitive to variation of NPP prevention assumptions. Changing current pneumococcal vaccination recommendations may require evidence of PCV13 effectiveness against NPP from ongoing clinical trials and await data availability on the indirect effects of childhood PCV13.

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13. BALANCING CARDIAC RISK AND IMMUNOLOGIC BENEFITS IN DECISIONS ON HIV ANTIRETROVIRAL TREATMENT INITIATION (ESP)

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Purpose: Some antiretroviral drugs may be associated with increased risk of cardiovascular morbidity. However, late initiation of antiretroviral therapy (ART) may diminish immunological benefits. The appropriate timing for initiating ART that accounts for these tradeoffs is currently unknown.

Method: We developed a stochastic dynamic programming model for optimizing quality-adjusted life expectancy (QALE) while balancing benefits of ART and cardiac risk. The population was stratified by age, gender, and CD4 count. Mortality was decomposed into HIV-specific, cardiac, and background age/gender-specific death rates. The optimal decision about ART initiation and remaining QALE was calculated for each age and CD4 state up to ≥ 650 cell/mm^3. We compared the expected remaining QALE between the optimal decision and if treatment is initiated regardless of CD4 count.

Result: For a 35 year-old male, it is optimal to start treatment at any CD4 count as long as ART is associated with a fixed percentage increase in cardiac mortality rate of less than 440% above baseline or a time-variable linear increase of less than 4% of baseline for each year on ART. If ART increases cardiac mortality rate by 5-22% for each year on treatment, it is optimal to wait until CD4 counts drop below 650 cells/mm^3.   For a 55 year-old male, it is optimal to start treatment at any CD4 count if increased risk from ART is a fixed multiplier less than 65% above baseline or a variable increase less than 3% for each year on ART. Optimal ART initiation state drops below 650 cells/mm^3 if additional cardiac mortality rate increases by 4-9% with each year on treatment, and below 500 cells/mm^3 if the increase is 10-45% with each year on treatment.   For all patients, regardless of age or CD4 count, the gain in QALE from following the optimal policy compared with always starting treatment (even at CD4≥ 650 cell/mm^3) is less than one month under a wide range of assumptions about ART-associated cardiac toxicity.

Conclusion: The optimal time to initiate ART depends on the magnitude and time-dependence of the additional cardiac mortality from ART. However, unless cardiac mortality risk increases significantly, the gain in life expectancy from following the optimal policy versus early treatment initiation is small and may be outweighed by the simplicity of a "treat always" recommendation.

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14. CLINICAL DECISION SUPPORT TO PROMOTE SAFE PRESCRIBING TO WOMEN OF REPRODUCTIVE AGE: DIFFERENTIAL EFFECTS BY SUBGROUP (ESP)

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Purpose: Primary care providers (PCPs) frequently prescribe medications which may lead to birth defects if used during pregnancy. Electronic medical records (EMR) with clinical decision support (CDS) may help alert physicians to this risk and promote counseling, but the impact of CDS may vary by visit subgroup.

Method: We developed two CDS system to promote communication about medication risks and evaluated their effect on the practices of 41 PCPs. PCPs were randomized to receive either a "simple" or "multifaceted" CDS system for 6 months. We abstracted EMR data from visits made by female patients aged 18-50 during the 10 months prior to implementation and the 6 months during the intervention; one visit was randomly selected from those made by each patient. Women with documentation of sterilization or infertility were excluded. Our primary outcome was the proportion of visits with a teratogenic prescription that had evidence of family planning services (e.g. counseling, contraceptive prescriptions, pregnancy tests or referrals to specialists). Using mixed effects logistic regression models adjusted for covariates and clustering, we compared the change in this proportion by type of CDS, patient age, physician gender, and whether the visit was with the patient's usual primary care provider. To test each comparison, an interaction term between time period and the factor was included.

Result: Study PCPs were 40+/-10 years old on average; 49% were women. A total of 805 EMR records were analyzed. Introduction of CDS was associated with a slight increase in the proportion of visits with provision of family planning services when a teratogen was prescribed (+2.6%points, 95%CI: -3.3 to +8.4). There was no difference in effect by CDS type (-1.4%points, 95%CI: -13.5 to +10.8). However, provision to women 30 years and older appeared to improve more than provision to women under 30 (+5.6%points, 95%CI: -9.3 to +20.5); visits with female physicians experienced a larger increase in provision than visits with male physicians (+3.9%points, 95%CI: -8.0 to +15.7); and provision appeared to increase more during visits with usual primary care providers than visits with less familiar providers (+9.8%points, 95%CI: -2.4 to +22.0).

Conclusion: Overall, these CDS systems slightly increased provision of family planning services when a teratogenic medication was prescribed. Subgroup analysis revealed that CDS was more effective for certain patient and provider subgroups.

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15. DIAGNOSTIC VALUE OF IMAGING IN SYSTEMIC EMBOLISM (ESP)

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Purpose: This study evaluated the value of transthoracic echocardiography (TTE), contrast TTE (cTTE), transesophageal echocardiography (TEE) and cardiovascular magnetic resonance imaging and angiography (CMR) for assessment of cardioembolic sources in a cohort of patients with recent systemic embolism and cardiac dysfunction.

Method: We prospectively enrolled 78 patients (58 men, mean age 63 ± 15 years) with recent systemic embolic event and evidence of left ventricular (LV) dysfunction (EF < 40% or regional wall motion abnormalities) on TTE. As part of the protocol, patients also underwent imaging using an ultrasound contrast agent (cTTE) and CMR within 1 week of TTE. TEE was also performed in a subset of patients if clinically indicated by the treating physician (n=26). Imaging studies were evaluated for potential sources of embolism. Information on resultant management of patients was obtained from review of the medical chart.

Result: Seventy-four patients (95%) had a cerebrovascular event, with the remaining 4 patients diagnosed with peripheral artery occlusion (2), retinal artery occlusion, and splenic infarct. Combining all modalities, a potential cardiovascular source of embolism was identified in 41 patients (53% of cohort), 5 with more than one potential source. The table below demonstrates different diagnostic testing strategies with diagnostic yield and effect on treatment.

Diagnostic Strategies	Potential Source of Embolism Identified (entire cohort; n=78)	Potential Source of Embolism Identified (subset with treatment data; n=57)	Strategy Resulted in Significant Change in Management
TTE only	12/78 (15%)	8/57 (14%)	2/57 (4%)
cTTE only	5/69 (7%)	4/50 (8%)	3/50 (6%)
TEE only	15/26 (58%)*	12/19 (63%)**	4/19 (21%)**
CMR only	31/78 (40%)***	17/57 (30%)*	8/57 (14%)*
TTE+cTTE	14/71 (20%)	10/51 (20%)***	4/45 (9%)
TTE+TEE	24/35 (69%)**	16/24 (67%)**	5/24 (21%)**
TTE+CMR	33/78 (42%)***	20/57 (35%)**	9/57 (16%)**
TEE+CMR	38/46 (83%)***	24/30 (80%)***	9/30 (30%)***
TTE+cTTE+TEE	25/38 (66%)***	18/26 (69%)**	7/26 (27%)**
TTE+cTTE+CMR	34/78 (44%)***	21/57 (37%)**	10/57 (18%)**
TTE+TEE+CMR	41/49 (84%)***	25/32 (78%)***	9/32 (28%)***
TTE+cTTE+TEE+CMR	41/50 (82%)***	26/33 (79%)***	10/33 (30%)***

*p<0.05 when compared to TTE only; **p<0.01 when compared to TTE only; ***p<0.001 when compared to TTE only

Conclusion: TEE and CMR both added significant diagnostic and treatment value to TTE. The use of TEE and CMR together, without TTE, provided the best streamlined diagnostic strategy for diagnosis and management of patients with systemic embolism.

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16. THE PRICE OF EMERGENCY CONTRACEPTION IN THE UNITED STATES: WHAT IS THE COST-EFFECTIVENESS OF ULIPRISTAL ACETATE VERSUS SINGLE DOSE LEVONORGESTREL? (ESP)

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Purpose: Ulipristal acetate (UA) is a novel form of emergency contraception (EC). Preliminary data demonstrates increased efficacy when compared with the current standard, single dose levonorgestrel (LNG). Unlike LNG, UA is currently not available without a prescription. This study examines cost efficacy of UA compared with LNG.

Method: A decision-analytic model was developed to compare cost efficacy of UA versus LNG in preventing unintended pregnancy when taken within 120 hours of unprotected intercourse. Our primary outcome was cost per quality adjusted life year (QALY). QALYs were discounted at a standard 3% rate. UA and LNG failure rates were obtained from a randomized non-inferiority trial and reported as 1.59% and 2.61% respectively. Cost data was obtained from hospital Medicaid payments and the gray literature. Univariate and bivariate sensitivity analyses, as well as Monte Carlo simulation and threshold analyses, were performed.

Result: Utilizing UA instead of LNG would result in 11 fewer pregnancies (UA 15 pregnancies/1000 women; LNG 26 pregnancies/1000 women). This increased efficacy is associated with a cost of $212,611 per QALY gained. At UA's current market cost of $77, a LNG failure rate of 3% is needed for UA to be cost effective. Sensitivity analysis and Monte Carlo simulations demonstrated that our results are robust.

Conclusion: Despite UA's superior efficacy in preventing unintended pregnancy, current market costs prohibit standard use. Efforts to reduce UA costs, as seen with over-the-counter status, should be promoted.

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17. IS CYP2D6 GENETIC TEST IN COMBINATION WITH HORMONE THERAPY FOR ER+ HORMONE SENSITIVE WOMEN WITH EARLY BREAST CANCER COST-EFFECTIVE? (ESP)

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Purpose: Personalized medicine is becoming very popular way to identify patients and groups who are most likely to benefit from new treatments. When the evidence is uncertain about a new genetic test, cost – effectiveness analysis can be used to pinpoint the key issues requiring additional attention. As an example we explore the cost-effectiveness of the test for CYP2D6. The scientific literature expresses different opinions about the benefit of the test, and the cost of subsequent treatment can be large. Approximately 60% of breast cancer cases are a type sensitive to hormones. Tamoxifen is the most widely used treatment of hormone-dependent breast cancer. Patients with reduced CYP2D6 activity may derive inferior therapeutic benefit from tamoxifen, and may alternatively be treated with newer aromatase inhibitors (AIs), but this is still

controversial. The alternative, AI has higher cost, which provides incentive for identifying patients who will benefit from tamoxifen prior to treatment. We estimated the cost-effectiveness of genetic testing in combination with hormone therapy for early breast cancer in Canada.

Method: We performed a cost-effectiveness analysis using a Markov model from a societal perspective and a lifetime horizon. The base case assumed 65-year-old ER+ hormone sensitive women with early breast cancer. We evaluated: genetic testing with subsequent treatment based on genetic status (tamoxifen for CYP2D6 extensive metabolizers and AIs for decreased metabolizers) vs. four treatment strategies currently investigated in the clinical trials without genetic testing. Those strategies includes: tamoxifen and AI monotherapies and tamoxifen/letrozole sequential therapies. Probabilistic sensitivity analysis was used to incorporate parameter uncertainties. Expected value of perfect information was performed to identify future research directions. Outcomes were quality-adjusted life years (QALYs) and costs.

Result: Our preliminary results shows that genetic testing and treatment combination strategy gained a 0.19 QALY when compared to no testing (tamoxifen monotherapy). The incremental cost was CAD $792 compared to standard care, and the incremental cost-effectiveness ratio (ICER) for the base case was $4,253 per QALY.

Conclusion: CYP2D6 Genetic testing in combination with hormone treatment for early breast cancer patients may be economically attractive in the current setting. Future research is required to determine efficacy of extended tamoxifen (more than 5 years) treatment, the rate of progression to a more advanced cancer health state and adverse events by CYP2D6 polymorphism.

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18. DO PATIENT-REPORTED OUTCOMES CONTRIBUTE TO REGULATORY DECISIONS IN THE USA AND EUROPE? A SYSTEMATIC REVIEW OF GUIDANCE DOCUMENTS AND AUTHORIZATIONS OF MEDICINAL PRODUCTS FROM 2006 TO 2010 (ESP)

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Purpose: To review the extent to which HRQL and other PROs have played a role in drug approval and labeling since the FDA issued its draft guidance on the use of PRO measures and the EMA, its reflection paper on HRQL in 2006.

Method: This research was conducted through a systematic manual review of therapy area-specific regulatory guidelines (US and EU) issued and product labels approved during the period of January 1st, 2006 to November 16th, 2010.

Result: 15 FDA and 34 EMA guidance documents were released containing recommendations for the inclusion of PRO endpoints in clinical trials. The FDA referred to HRQL specifically (as a secondary endpoint) in three of 15 (20%) guidance documents mentioning PRO endpoints – for chronic obstructive pulmonary disease, oncology and weight management. The EMA recommended use of HRQL endpoints in 22 of the 34 (65%) guidances. Interestingly guidelines issued by the EMA during our period of analysis have gained in precision and clarity compared to previous periods. The FDA approved 93 products with label claims that included PRO endpoints (21.5% of 432 total approvals). Of those, 8 products (8.6% of all products with a PRO claim) documented treatment benefits characterized as HRQL. The EMA approved 54 products that included PRO endpoints (21.8% of 248 total approvals), of which 16 products (29.62% of all products with a PRO claim) reflected HRQL data.

Conclusion: Our review showed that patients' perspective in clinical research is important for the EMA and FDA, with HRQL endpoints still playing a minor role in product claims. Our analysis suggests that EMA's receptivity to HRQL endpoints is greater than FDA's, and that both agencies value patient-reported symptom data. The discrepancy in the prevalence of PRO and HRQL between guidance documents and product labels suggests that for successful submissions additional work is required to comply with current regulatory standards for evaluating PRO in clinical trials. The role of PRO and HRQL should be considered beyond clinical research and labeling claim, into patients' real life and their influence on payers' decisions and prescribers' attitudes should be further studied.

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19. COVERAGE WITH EVIDENCE DEVELOPMENT IN ONTARIO: EXPERIENCE WITH DESIGNING FIELD EVALUATIONS TO INFORM HEALTH POLICY DECISIONS (ESP)

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Purpose: Field evaluations that provide evidence to inform health policy recommendations by the Ontario Health Technology Advisory Committee (OHTAC) have been conducted by PATH since 2003. These studies examine healthcare technologies with uncertainty regarding their effectiveness and high impact on healthcare resources. The purpose of this summary is to outline the processes developed to design and implement field evaluations and to discuss the associated challenges with these studies.

Method: Field evaluations have employed a variety of study designs including randomized controlled trials, observational studies, registries and retrospective chart reviews. The studies have been developed to capture clinical, economic, patient-related and organizational outcomes. Implemented in a variety of health care settings within Ontario, using coverage with evidence development (CED) where appropriate, these studies are conducted in collaboration with clinicians and researchers to collect evidence to inform health policy decisions. Following completion of the field evaluations the results are provided to OHTAC to help inform their recommendations to the Ontario Ministry of Health & Long-term Care.

Result: Ongoing field evaluations of pre-hospital diagnosis and management of chest pain, hyperbaric oxygen therapy, photo-selective vapourization of the prostate, electronic chronic disease management systems in diabetes care are at various stages. Completed field evaluations examining drug eluting stents, endovascular repair of abdominal aortic aneurysms, multifaceted diabetes care 64-slice computed tomography coronary angiography and the use of magnetoencephalography in children with epilepsy referred for surgery have presented various challenges related to subject recruitment, availability of research personnel in non-academic settings, diffusion of technology outside the study and alignment with policy decision making timelines.

Conclusion: Through PATH's CED process, field evaluations have been used to inform health policy decisions in the province of Ontario resulting in support and funding of non-drug healthcare technologies. Field evaluations of diffused new technologies have had limited impact on technology uptake thus demonstrating the need to implement conditional funding arrangements prior to widespread diffusion. Lessons from this program can be useful to assist with the development of similar programs globally.

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20. HEALTH ECONOMIC EVALUATION OF THROMBOPROPHYLACTIC TREATMENT WITH RIVAROXABAN OR DABIGATRAN COMPARED WITH ENOXAPARIN IN PATIENTS UNDERGOING ELECTIVE HIP- OR KNEE REPLACEMENT SURGERY (ESP)

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Purpose: For years subcutaneous LMWHs like enoxaparin have been the primary choice for thrombosis prevention after major orthopaedic surgery. Recently, two new oral anticoagulants, rivaroxaban and dabigatran, have been suggested as possible alternative prophylactic treatments in Norway. However, the cost-effectiveness of the two drugs remains unknown. The aim of this study was to assess the cost-effectiveness of dabigatran and rivaroxaban compared with enoxaparin for the prevention of thromboembolism after total hip replacement (THR) and total knee replacement (TKR) surgery.

Method: In order to assess the cost-effectiveness of alternative thrombo-prophylactic interventions, a decision model was developed. The model combined two modules; a decision tree for the short-term prophylaxis (90-day post-surgery time horizon) and a Markov model for the long-term complications (lifetime analysis). Efficacy estimates were based on meta-analyses of published RCTs identified by a systematic literature search. The quality of the documentation was evaluated using GRADE. Quality-of-life data were extracted from published literature. Health state costs were taken from various local data sources. We performed probabilistic sensitivity analyses, designed as a Monte Carlo simulation with 10,000 iterations, to get an impression of the uncertainty surrounding our analyses.

Result: In THR patients, the comparison of dabigatran with enoxaparin resulted in negative net health benefit (NHB) assuming a willingness to pay per QALY gained of USD80,000; hence it cannot be considered a cost-effective strategy relative to enoxaparin. Rivaroxaban compared with enoxaparin resulted in a cost-effectiveness of USD7,500 per QALY, which can be considered a cost-effective strategy. In TKR patients, both rivaroxaban and dabigatran were less costly but resulted in slightly fewer QALYs compared with enoxaparin (negative NHB); therefore they cannot be considered cost-effective strategies after TKR. According to the probabilistic sensitivity analyses, there are uncertainties associated with the results. Assuming a willingness to pay of USD80,000, rivaroxaban following THR had a probability of 38% and enoxaparin following TKR had a probability of 34% of being cost-effective. The analysis of expected value of perfect information on parameters (EVPIP) indicated that more research on efficacy and safety data would have the greatest impact on reducing decision uncertainty.

Conclusion: There is a great uncertainty regarding which strategy is the most cost-effective. However, rivaroxaban and enoxaparin had a slightly higher probability of being cost-effective alternatives following total hip or knee replacement, respectively.

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21. THE ROLE OF MEDICAL SUPPORT PERSONNEL IN PREEMPTIVELY CHANGING CLINICAL DECISION PROCESS (ESP)

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Purpose: Prescribing medications and ordering laboratory tests are key elements in clinical decision process (CDP). However these decision junctions are usually one-dimensional and focus primarily on medical personnel. We suggest integrating multidisciplinary synchronized decision support teams into these processes, thus reducing risk while improving financial outcome.

Method: The prescribing pathway and laboratory test ordering patterns were studied and analyzed in details in order to identify potentially problematic issues in these processes. The results of this analysis were used to create structured decision-rules and intervention algorithms:

1. Drug related problems algorithm (DRPA) – prescriptions arriving at the pharmacy from 3 internal medicine wards were preemptively screened and clinically checked according to pre-determined criterion. The results were communicated to the medical teams in the department.
2. Macrocytic anemia algorithm (MAA) - requested vitamin B12 and folic acid test orders were inspected by hematology laboratory personnel and only executed according to predetermined clinical rules.

Result:

1. DRPA: during 2010 pilot study approximately 1000 potential errors were identified, this is in comparison to traditional voluntary error reporting which was approximately 15% of the total number of intervention see with DRPA. The acceptance rate of intervention was 98%. The most frequent interventions were: incorrect dosing, therapeutic duplication, drug interactions and dispensing mistakes.
2. MAA: 70% percent decrease of total hospital vitamin B12 and folic acid tests was recorded when comparing semiannual number of these tests performed prior and after to initiation of MAA (approximately 6000 and 2000 respectively). Furthermore there was statistically significant increase in detection of patient suffering from anemia when compared to pre MAA period (70% $p<0.005$). This indicates an increase in test yield with substantial direct cost savings.

Conclusion: Many electronic decision support systems are available commercially, however there is an increased body of evidence indicating that such systems are expensive to implement, labor consuming and are not well integrated into daily prescriber activities. The design and implementation of a preemptive human operated intervention algorithm concentrating on the CDP can be a successful strategy. This may be achieved, as seen in our study, by utilizing existing medical support human resources and synchronizing them into decision junctions leading into substantial quality improvement, risk reduction and substantial savings. Accordingly the Hospital management expanded the DRPA to 5 additional wards.

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22. WITH MORE EFFECTIVE THERAPIES, SHOULD WE SCREEN FOR CHRONIC HEPATITIS C IN THE U.S.? (ESP)

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Purpose: Chronic hepatitis C (HCV) is a serious liver disease affecting over 3 million Americans. New, more effective treatments have recently been developed, though they are likely more expensive than current therapies. Their development calls for cost-effectiveness assessment, especially in relationship to existing guidelines that discourage general population screening for chronic HCV. We assessed the cost-effectiveness of new HCV treatments and their impact on HCV screening for asymptomatic U.S. adults (40-60 years old) at a routine medical visit.

Methods: We developed a decision-analytic Markov model that included the natural history of chronic HCV (genotypes 1, 2, or 3) and advanced liver disease as well as combinations of HCV screening and treatment options. We assessed the lifetime costs (2010 USD), quality-adjusted life-years (QALYs) gained, and incremental cost-effectiveness ratios (ICERs) of strategies that included: no screening, risk-factor guided screening, and universal screening, followed by either standard treatment (peginterferon alfa and ribavirin) or standard therapy in combination with a recently-developed protease inhibitor for patients with genotype 1 virus (Telaprevir, Vertex Pharmaceuticals).

Results: In men, universal screening followed by treatment of genotype 1 chronic HCV positive individuals with new combination therapy had an ICER of less than $50,000/QALY when the cost of the new protease inhibitor was less than $40,600 for a course of therapy. In women, universal screening followed by new treatment had an ICER of less than $50,000/QALY when the cost of the new protease inhibitor was less than $21,600 for a course of therapy. Strategies with risk-factor guided screening with either treatment option were generally dominated. Increasing treatment acceptance rates over historical levels further improves the cost effectiveness of screening for hepatitis C followed by the new combination therapy. For example, in men, if treatment initiation rates are double historical levels, universal screening followed by combination therapy has an ICER of less than $50,000/QALY for prices of the new protease inhibitor up to $43,200 for a course of therapy.

Conclusions: Newer combination therapy for genotype 1 individuals identified via universal screening is likely cost-effective assuming moderate improvements in efficacy over standard therapy, even assuming fairly substantial increases in total drug costs. Findings from this study suggest new therapies may justify a policy shift toward higher rate of screening and treatment of HCV infections in the U.S.

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23. RATIONAL DECISION MAKING REVISITED: INSIGHTS FROM STUDYING INDIVIDUAL HEALTHCARE FUNDING DECISIONS IN ENGLAND (ESP)

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Purpose: In this paper, we explore how rational decision making is accomplished in practice in the context of individual funding reviews which involve decisions about whether to fund treatments in exceptional cases. In this context the groups involved overtly seek to arrive at rational and publically defensible decisions. We address the following important questions: What resources do actors rely on to perform their roles as 'rational' decision makers? What models of rational judgement do organisational actors draw upon in practice, and how? Our suggested answers to these questions advance understanding of rational decision making in healthcare.

Method: We conducted a focused ethnography of decision making in the English National Health Service (NHS). Our empirical setting was healthcare purchasing (commissioning) organisations, which consider individual funding requests (IFRs) made for medicines or other treatments that are not routinely purchased. We observed in real time the making of decisions for 118 IFR cases, which generally involved thorough

evaluation of the available evidence and supporting documentation. We analysed our rich observational data iteratively and thematically.

Result: Our analysis revealed that, for rational decision making to be accomplished, organisational actors perform three kinds of interrelated activities: (i) addressing procedural requirements, (ii) interpreting and making sense of decision cases and (iii) deliberating the merits of cases on the basis of public reasons. Our data indicate that decision makers seek rationality, by, not only calculating the consequences of their decisions for individual patients, but also (and mainly) crafting a robust and rigorous *justification* on the basis of evidence as regards the funding merits of their decision. This form of decision making, we suggest, represents a distinct pursuit of rational judgement in practice.

Conclusion: Our study makes an important contribution to our understanding of how rationality is sought and performed in actual healthcare organisational situations. Our investigation of IFR decision making in the NHS suggests that the understanding of rationality may be significantly improved if we address and examine the pursuit of rational judgement as a situated empirical phenomenon. The results of our focused ethnography vividly demonstrate in fact that deciding rationally and appearing to do so is a complex and uncertain social process bounded by demands for rigorous justifications of a decision.

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24. GAZING INTO THE MS CRYSTAL BALL: A NOVEL PREDICTIVE TECHNIQUE FOR IDENTIFYING MS NON-ADHERENCE (ESP)

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Purpose: For patients with Multiple Sclerosis (MS), adherence to disease modifying therapy (DMT) is critical in altering the clinical progression of disease and preventing costly hospitalizations; therefore it is important to identify patients with an increased likelihood of becoming non-adherent to DMT.

Method: We used a traditional binary logistic regression technique combined with a new grouping strategy to develop a predictive model that rank orders MS patients from highest to lowest likelihood of becoming non-adherent to DMT in the next six months. Several input factors, such as demographic and personal information, prescription benefit plan sponsor information, prescription attributes, and previous prescription information were used to build the predictive model. There were 11,742 cases in the population. This model was developed on the overall population (experienced and naïve to therapy). Due to a relatively small population sample, a random 50% of the population was selected for model development and 50% was used for validation. Robustness across time was also tested on a non-contemporaneous sample of 12,946.

Result: We tested the robustness of the final model on contemporaneous and non-contemporaneous validation data sets. The performance of the model was good and consistent across development and validation data sets. The results were better than those reported for other adherence predictive models; the c-statistic was 0.83 and the KS statistic was 0.529. The lift chart showed that 30% of the population contained 57% of the non-adherent members.

Conclusion: We successfully developed a new approach to identify, in advance, which MS patients are at risk of non-adherence to DMT. By allowing healthcare providers to focus their interventions on MS patients most likely to have an adherence problem and to intervene before medication non-adherence occurs, the model may play a key role in better managing potential clinical and economic outcomes.

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25. WITHDRAWN - A SYSTEMATIC REVIEW OF ADVANCED LUNG CANCER AND ITS ECONOMIC BURDEN (ESP)

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Purpose: A systematic review of the literature was performed to understand the economic burden of managing advanced lung cancer.

Method: An electronic literature search of EMBASE, MEDLINE and HEALTHSTAR was performed (Jan 2000-August 1, 2010). The search terms "Lung Cancer" and "Costs and Cost Analysis" or "Economics" were used. Inclusion criteria: treatment costs for advanced (stage III-IV) non-small cell lung cancer (NSCLC). Exclusion criteria: mixed cancer or non-treatment costs, costs of early lung cancer, case reports, reviews, editorials, and conference reports. Two reviewers independently evaluated articles. Consensus agreement was reached for all included and excluded articles. Costs are reported in 2010 Canadian dollars.

Result: The literature search identified 3,654 abstracts: 44 articles were included. The articles spanned 17 countries. Cost identification (17) and cost-minimization (12) were the most common methodologies performed. Only 6 cost-utility analyses were completed. A perspective was reported in 30/44 studies and the most commonly chosen viewpoint for analysis was the healthcare system. The time horizon for collection of costs and health outcomes was missing in 8 studies and the time horizon used varied widely among studies. Sensitivity analyses were performed in 25/44 studies. Overall mean costs per patient for managing advanced NSCLC ranged from $25,439 to $96,958. The majority of articles reported mean costs per patient for chemotherapy and ranged from $1,121 (Vinorelbine) to $255,553 (Docetaxel). Mean costs of Gemicitabine + Cisplatin (8 studies) ranged from $4,243 to $69,970. Mean costs of Docetaxel (8 studies) ranged from $8,785 to $255,553.

Conclusion: Lung cancer is the leading cause of cancer-related mortality worldwide. The majority of patients are ineligible for curative surgical treatment. The cost of caring for advanced lung cancer is extremely high. The literature includes few cost-utility studies which should be of greater priority in a non-curative population. This systematic review will help to inform future economic evaluations in the area of advanced NSCLC. Population-based phase IV trials evaluating the costs and effects of advanced NSCLC treatment are lacking and are necessary to further the work completed alongside randomized controlled trials.

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26. A DISCRETE-EVENT SIMULATION MODEL TO EVALUATE COST-EFFECTIVENESS OF SMOKING CESSATION TREATMENTS (ESP)

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Purpose: This study aims to estimate the health and economic impact of different strategies (nicotine replacement therapy, bupropion, varenicline, and non-pharmacologic-assisted cessation) for smoking cessation in achieving long-term abstinence from cigarette smoking.

Method: A discrete-event simulation model was developed to allow for individual-level variation in treatment adherence, relapse, and risk of co-morbidity/mortality in assessing the effectiveness of smoking cessation interventions. We utilized data from multiple sources (US Census, Centers for Disease Control and Prevention, and literature) to simulate individuals' actions and associated responses to different interventions along with smoking-related co-morbidities. Outcomes of interest included estimates of sustained abstinence from smoking, quality adjusted life years, cost of treatment, and additional health-related costs due to long-

term effects of smoking (lung cancer, and chronic obstructive pulmonary disease, stroke, coronary heart disease). Cost-effectiveness analysis was performed after a horizon of 1 year, 10 years, 30 years, and lifetime.

Result: Among 10,000 smokers attempting to quit smoking, 1 year recidivism rates among those alive at follow-up were the following: nicotine replacement treatment, 86.94%; bupropion, 77.43%; varenicline, 78.41%, and non-pharmacologic-assisted, 95.04%. Nicotine replacement treatment, bupropion, varenicline, and non-pharmacologic-assisted had a recidivism rate of 93.68%, 88.98%, 89.72%, 97.42% among those alive at 30 years, respectively. Comparing nicotine replacement treatment, bupropion and varenicline to non-pharmacologic-assisted cessation produced cost per quality adjusted life years saved of -1.69, -1.54, and -2.61 at lifetime, respectively.

Conclusion: Nicotine replacement treatment, bupropion, and varenicline are cost-effective and quality of life is improved in comparison with non-pharmacologic-assisted cessation. Varenicline is the dominant treatment option when comparing pharmacologic options for smoking cessation.

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27. CORONARY COMPUTED TOMOGRAPHY VERSUS EXERCISE TESTING IN PATIENTS WITH STABLE CHEST PAIN: COMPARATIVE EFFECTIVENESS AND COSTS (ESP)

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Purpose: To determine the comparative effectiveness and costs of a CT-based strategy (CT-strategy) and a stress-electrocardiography-based strategy (standard-of-care; SOC-strategy), for diagnosing coronary artery disease (CAD).

Method: Decision analysis based on a real-world population of 471 outpatients with follow-up. All patients presented with stable chest pain and were scheduled for both stress electrocardiography (X-ECG) and coronary CT angiography (CCTA). Outcomes were correct classification of patients as CAD– (no obstructive CAD), CAD+ (obstructive CAD without revascularization) and Revascularization (using a combination reference standard based on catheter-based coronary angiography, CCTA and revascularization within 6 months), diagnostic costs, lifetime health care costs, and quality-adjusted life years (QALY).

Result: For men (and women), diagnostic cost savings were €245 (€252) for the CT-strategy as compared to the SOC-strategy. The CT-strategy classified 82% (88%) of simulated men (women) in the appropriate disease category, whereas 83% (85%) were correctly classified by the SOC-strategy. The long term cost-effectiveness analysis showed that the SOC-strategy was dominated by the CT-strategy, which was less expensive (-€229 in men, -€444 in women) and more effective (+0.002 QALY in men, +0.005 in women). The CT-strategy was less effective compared to SOC (-0.003 QALY) in men with a pre-test probability of ≥70%. When correcting for (potential) overestimation of disease by CCTA, cost-savings and gains in effectiveness were reduced.

Conclusion: Our decision analysis suggests that a CT-based strategy is superior to standard-of-care in particular for all women and for men with a pre-test probability <70%.

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28. DECISION MAKING BIASES IN JUDGMENTS ABOUT VASCULAR RISK FACTORS (BEC)

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Purpose: We investigate effects of psychological biases (i.e., overconfidence, framing and anchoring) on health-related judgments to test if biases can be integrated into the promotion of health-protective behaviors, specifically for lowering vascular risk factors.

Methods: To measure, if and how decisions on vascular risks are affected by the biases, we used self-administered questionnaires for data collection. Four different versions of the questionnaires were randomly given out to subjects. Manipulations were balanced between versions. We additionally asked for self-reports on the already performed health behavior, smoking status, as well as body weight. The questionnaire was completed by 187 healthy adults (86 women, 96 men, 5 missing values) with a mean age of 24.6 years ($SD_{age} = 4.59$).

Results: First, we found a general effect of overconfidence. On average, individual risks for diabetes, heart attack, and stroke were estimated to be significantly lower than that of a person with the same age, gender, and level of education. Similarly, the own life expectancy was estimated as "above average". Second, as suggested by prospect theory, we found significant effects of framing. Subjects judged the intention to lose weight with different importance, when this information was presented in relation to people being thicker or thinner than themselves. If informed that 65% of the population weighed less, subjects were more concerned about controlling their weight than if informed that 35% of the population weigh more. Third, hypertension prevalence was estimated higher after presentation of a high than a low irrelevant anchor (Figure 1). Fourth, subjects from the high anchor group perceived blood pressure monitoring as less beneficial.
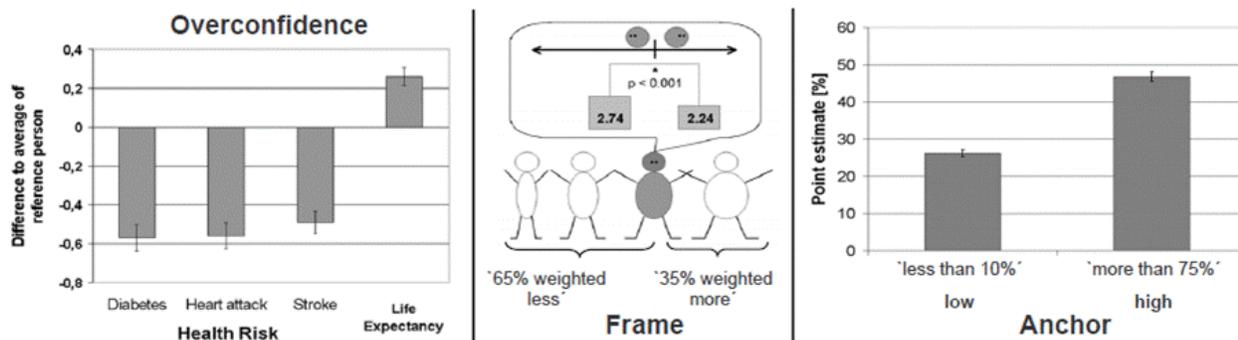
Figure 1: General results for the three psychological biases addressed in the study (overconfidence, framing, and anchoring)

Conclusions: We showed that judgments and behavioral motivation related to vascular risk factors are psychologically biased. In our study individuals are (i) overconfident about their vascular risks, (ii) easily biased in estimation of risk factors frequencies and (iii) lose concern for vascular risk factors if these are perceived to be frequent through the setting of different anchors. Beside a deeper understanding of why people often behave problematically in health related decision making our findings show that different contents in communication instruments can influence patients' perception and decision making in the field of vascular risks. We suggest that health-care providers should take into account the existence and relevance of those biases when conceptualizing communication instruments.

29. HEALTHY FOOD CHOICES: THE ROLE OF FRONT OF PACK NUTRITIONAL LABELLING FORMAT (BEC)

Hannah McClure, BSc, Danny Campbell, PhD and W. George Hutchinson, Professor, Queen's University Belfast, Belfast, United Kingdom

Purpose: Increasing levels of obesity have signalled a need for dietary change. Food choice is a fundamental factor in weight control and front of pack (FOP) nutritional food labelling is a widely used tool to help consumers reach healthy food choices. This paper explores the influence of FOP nutritional food labelling format on consumer food choices.

Method: We examine the effects of FOP label format with data collected using the discrete choice experiment methodology. The experiment required respondents to choose between two experimentally designed food baskets and their current (or status-quo) food basket. Each food basket was described in terms of four nutritional attributes: (i) fat, (ii) saturated fat, (iii) salt, and, (iv) sugar. A price attribute was also included to portray the baskets at different price levels. Using a variety of discrete choice models we explore the framing effects that competing FOP labelling styles have on influencing shopping behaviour for healthy food.

Result: Results indicate that the behaviour and tendency of respondents choosing healthy food baskets versus their current (unhealthy) food basket is sensitive to the manner in which the nutritional information is described to them. We observe that, in general, using a 'traffic-light' colouring scheme leads to the most significant shift towards healthy food choices compared to a 'pastel' colouring scheme. Nevertheless, we find that the influence of the colour scheme used to convey nutritional information varies among different subsets of sociodemographic groups and obese and non-obese individuals. Evidence that the different formats lead to different levels of cognitive burden is also found.

Conclusion: FOP labelling format appears to have an influence on consumer's ability to make healthier food choices. A consistent approach to FOP labelling may result in less consumer confusion, healthier food decisions and, thus, have gains from a public health perspective. These findings offer an independent evaluation and contribute to the ongoing debate on FOP food labelling and the FOP format which leads to the healthiest food choices.

30. VALUE CLARIFICATION IN DECISION AIDS: A MISSING ELEMENT? (DEC)

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Purpose: Decision aids seek to inform patients to allow weighing of benefits and harms of treatment options and deliver decisions consistent with patient's preferences. Unlike most goods and services, where markets facilitate the construction of stable preferences, evidence indicates that patients do not have inherently well formed values for much of health care, where the expected outcomes are unfamiliar. Theory suggests that true preference construction requires individuals to trade-off between different outcomes. We sought to review the use and type of explicit value clarification exercises in current decision aids and to assess how many use constrained exercises involving trade-offs.

Methods: The complete inventory of decision aids held by the Ottawa Hospital Research Institute was reviewed. For each decision aid an assessment was made of whether a value clarification exercise was

included and, if it was, the type of value exercise. Constrained value clarification techniques contain some notion of sacrifice, e.g. a trade-off between at least two different attributes (e.g. benefit, harm or other characteristic). Non-constrained approaches include rating scales (where respondents rate the importance of each attribute), and weigh scales (where respondents indicate their agreement or disagreement with statements).

Results: A total of 304 decision aids (8 unavailable) covering 145 different decisions were reviewed. 217 (71%) decision aids explicitly included a value clarification component. None used a constrained exercise. The vast majority of those that sought value clarification (97%) used a rating scale (most commonly a 5-stars or likert scales) to establish attribute importance.

Conclusions: While the basis for providing value clarification exercises is strong, our findings show that exercises in current decision aids are based on unconstrained techniques not requiring trade-offs. The concern is that unconstrained techniques fail to support the construction of stable values for treatment outcomes that are unfamiliar to the patient, and if that is the case then such techniques used in decision aids may impede preference-driven patient decision making. While constrained exercises are recognized to be more difficult to understand and implement, the wide use of computers has led to their implementation in other fields of decision making. Areas for further research include: (a) the impact of value clarification exercises on patient choices; and (b) the feasibility of constrained techniques in decision aids, given their time and cognitive requirements.

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31. GROUP CLUSTERING OF DCE-ELICITED PREFERENCES PREDICTS ADHERENCE TO ASTHMA PREVENTER MEDICATION (DEC)

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Purpose: Patients' decisions about whether or not to take prescribed medication (i.e., to adhere) are shaped not only by their knowledge and beliefs about their condition and its treatment options, but also by what they value in these domains. Such decisions often involve trade-offs, and so economic choice methodology has been used as a means to elucidate preference-based decisions. However, individuals' value systems differ and this particularized information is obscured in the group-level parameters generated by standard choice tasks. Heretofore, the dominant approach to assessing the heterogeneity of preferences has been straightforward rating or ranking tasks, which cannot educe trade-offs. This study represents an attempt to extract variations in preference parameters within a patient group from discrete choice (DCE) methodology and to assess their contributions to adherence decisions.

Method: 140 patients with asthma were asked to select which hypothetical medication they would choose from among eight choice sets that varied along seven attributes (Long Term Efficacy, Short Term Efficacy, Immediate Relief, Number of Inhalers, Steroid Dose, Administration Time, and Side Effects). They also rated the importance of each of these attributes on 10-point Likert-type rating scales.

Result: Data from the DCE were subjected to a latent cluster analysis which suggested four distinct groups of patients: Those whose choices are based on (1) long term benefits, (2) medication side effects, (3) a trade-off between side effects and efficacy and (4) all attributes equally. Based on stepwise regression analyses, membership in the group valuing long-term outcomes predicted an additional 8% of the variance ($\Delta R^2 = .08$, $F = 4.0, p < .001$) in patient-reported adherence to asthma preventer medication above and beyond that accounted for asthma knowledge and beliefs alone. Notably, none of the rating scale items, including the one tapping long term effectiveness, correlated with adherence.

Conclusion: We have demonstrated an approach to elucidating patient variations in preferences from standard DCE methodology. Moreover, we have shown that these preferences better predict behaviour than do preferences gleaned from the more standard rating scales that lack the capacity to capture the trade-offs inherent in most real-world decisions.

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32. INVESTIGATING THE ROLE OF RISK PERCEPTIONS IN PREDICTING PROSTATE CANCER SCREENING BEHAVIOUR AS A FUNCTION OF FAMILY HISTORY: THE CONTRIBUTION OF AVAILABILITY AND REPRESENTATIVENESS HEURISTICS (DEC)

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Purpose: To investigate the contribution of the availability and representativeness heuristics in explaining the relationships between risk perceptions and screening behaviour for men with and without a family history.

Method: First-degree relatives of men with prostate cancer (n=207) and men without a family history of prostate cancer (n=239) from Queensland, Australia completed a Computer Assisted Telephone Interview (CATI) examining prostate cancer risk perceptions, screening behaviours, the availability of information about prostate cancer (availability heuristic), and men's perceptions of their similarity to the typical man who gets prostate cancer (representativeness heuristic). The relationships between heuristics and family history, risk perceptions, and screening behaviour were examined in a path model based on previous research and theoretical considerations.

Result: Men with a family history reported greater risk perceptions and greater prostate cancer screening behaviour than did men without a family history. However, risk perceptions did not predict prostate cancer screening. Analyses examined a path model incorporating the representativeness and availability heuristics as a moderator and as mediators, respectively, for the relationships between family history, risk perceptions and screening behaviour. A multiple-group structural equation model comparing path models for men with and without a family history of prostate cancer found that the relationship between perceived similarity to the typical man with prostate cancer and greater risk perceptions was moderated by family history such that this relationship was greater for the family history group. Analysis of mediation pathways revealed that the number of recent discussions about prostate cancer acted as a mediator of the relationships between family history and risk perceptions, and that the number of acquaintances men knew with prostate cancer mediated the relationship between family history and screening behaviour.

Conclusion: Despite reporting greater perceptions of risk for developing prostate cancer, men with a family history do not necessarily participate in prostate cancer screening as a result of having high risk perceptions. Rather, men with a family history make judgements about prostate cancer risk and screening behaviours based on the availability of information about prostate cancer within their environment.

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33. PATIENT PRIORITIES REGARDING CURRENTLY RECOMMENDED COLORECTAL CANCER SCREENING OPTIONS (DEC)

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Purpose: US colorectal cancer screening guidelines endorse multiple options and recommend that screening decisions reflect individual patient preferences. A recent NIH consensus panel identified achieving a better understanding of patient preferences regarding colorectal cancer screening as a high priority topic. The study goal was to elicit and examine patient priorities for trade-offs involved in choosing among currently recommended colorectal cancer screening options.

Methods: The study population consisted of patients attending primary care practices in Rochester NY, Birmingham AL, and Indianapolis IN. Study participants used the Analytic Hierarchy Process (AHP) to analyze ten alternatives that represent the full range of currently recommended colorectal cancer screening options. The analysis included four decision criteria: prevent cancer, avoid screening side effects, minimize false positive screening tests, and the combined importance of frequency of testing, test preparation, and screening procedure. All patients performed the analysis using age-adjusted outcome estimates and a standardized computer program running on a laptop computer.

Results: Four hundred eighty four patients completed the study; 66% were female, 49% were African-American, 9% had low literacy skills, and 27% had low numeracy skills. Overall, preventing cancer was given the highest priority (mean priority score 55%). Hierarchical cluster analysis revealed six distinct priority clusters. Preventing cancer was the highest priority criterion in 3 clusters; each of the other 3 criteria was the highest priority criterion in one of the other 3 clusters. Seventy-nine percent of patients achieved technically adequate analyses. Technical adequacy was associated with patient gender ($p = 0.008$) and study site ($p < 0.001$) but not literacy or numeracy. More than 90% of study participants indicated that they fully understood the concepts involved and 88% indicated they were willing to use similar methods to help them make important healthcare decisions.

Conclusions: These results highlight the need to develop tools to facilitate incorporation of patient preferences into screening decisions. The large number of patients able and willing to perform a complex AHP analysis suggests that highly sophisticated decision support tools like the AHP are feasible for clinical use. Such tools have the potential to foster consistently high quality decision-making regarding colorectal cancer screening and other choices that depend on the successful integration of objective data, subjective judgments, and personal preferences.

34. ATTITUDES TOWARDS MODE OF DELIVERY CHOICE AMONG A DIVERSE POPULATION OF PREGNANT WOMEN (DEC)

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Purpose: To examine attitudes and predictors of attitudes towards being offered a choice between planned vaginal and planned cesarean delivery among pregnant women.

Methods: We recruited pregnant women who were between their 24th and 36th gestational week for a study of mode of delivery preferences. During a face-to-face interview, we administered a questionnaire which included items related to sociodemographic characteristics, delivery history, depression and self efficacy. Participants also were asked to rate their agreement (on a 5-point scale) with two statements: "All pregnant women should be offered a choice between attempting a vaginal birth and having a cesarean delivery" and "Having a choice between having a cesarean delivery or attempting to have a vaginal birth would be a good

thing for me." Multivariate logistic regression analysis was used to identify predictors of agreement with each of these statements.

Results: The 160 women who participated in the study were racially/ethnically diverse (48% white, 26% African American, 18% Asian or Pacific Islander and 9% Latina) and varied substantially in their delivery histories (about a third each were nulliparous (34%), had only vaginal deliveries (35%), or had at least one cesarean section (31%)). Thirty percent of the participants agreed that women should be offered a choice of delivery approach and slightly more women (35%) felt that having this choice would be good for them. Having a prior cesarean section was the only significant predictor of believing that having a choice would be good for them (adjusted OR 2.78, 95% CI 1.15-6.71, p=.02), while having less than a college degree (adjusted OR 2.56, 95% CI 1.03-6.36, p=.04) and lower self-efficacy scores (adjusted OR=0.52, 95% CI 0.28-0.97, p=0.04 for every 1 point increase in this 5 point scale) emerged as predictors of feeling all women should have this choice.

Conclusions: Women's attitudes toward being offered – or having others be offered - a choice between planned vaginal and planned cesarean delivery vary widely, and are related not only to their delivery history but also to their education and sense of self efficacy. A better understanding is needed of women's mode of delivery preferences, their attitudes towards different management options, and their preferences regarding how and when these options are discussed to help them experience the type of delivery they desire.

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35. LITERACY AND NUMERACY IN VETERANS AND THEIR IMPACT ON CANCER TREATMENT PERCEPTIONS AND ANXIETY (DEC)

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Purpose: To ascertain the literacy and numeracy skills of Veterans at 4 VAs and determine it's impact on anxiety, perceptions of active cancer treatment, and shared decision making.

Method: 574 men were recruited for a study testing two decision aids for early stage prostate cancer. Men were recruited at their prostate biopsy appointment at either Ann Arbor, Durham, Pittsburgh, or San Francisco VA. 83% of patients identified themselves as Caucasian and 16% as African American. As a part of a baseline questionnaire, each patient completed literacy (REALM) and numeracy (Subjective Numeracy Scale) measures. Patients also completed questions about their beliefs about cancer treatment (e.g. "How important is it to treat cancer, whether or not it makes a difference in survival?"), their anxiety about prostate cancer, and their preference for shared decision making about prostate cancer.

Result: 26% of men were classified as having inadequate literacy and 74% men demonstrated adequate literacy. The mean numeracy score was 4.57 (SD=1.04, range = 1-6). Literacy and numeracy was moderately correlated, r = 0.24, p<0.001. Literacy and numeracy both differed by race with Whites having higher literacy (X^2= 18.42, p<0.001) and higher numeracy (4.64 vs. 4.23, F=13.05, p<0.001). More specifically, 44% of people who did not identify as White demonstrated inadequate literacy, whereas 23% of Whites had inadequate literacy. Those with adequate literacy were less anxious about prostate cancer than those with inadequate literacy (M = 0.93 vs. 1.20, X^2 = 28.83, p<0.001), with similar findings for numeracy. Individuals with inadequate health literacy were more likely to endorse the following statements "important to treat

cancer whether or not it makes a difference in survival", "important to do what doctor thinks is best", "doing everything to fight cancer is a right choice", "only responsible thing is to do some sort of active treatment" (all p's<0.001). There were no literacy or numeracy differences in people's interest in shared decision making for prostate cancer treatment.

Conclusion: While the majority of Veterans have adequate literacy, a significant minority does not, and almost half of underrepresented minorities have inadequate literacy. Those with inadequate literacy more strongly endorse having active treatment, even if not beneficial, and have increased anxiety about the health condition they were being seen for.

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36. IF I'M NOT HIGH RISK, THEN THAT'S NOT MY RISK: TAILORING ESTIMATES FOR LOW-RISK PATIENTS MAY UNDERMINE PERCEIVED RELEVANCE (DEC)

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Purpose: Unlike printed materials based on the average patient, computer-based patient decision aids can tailor risk estimates to individual patient characteristics. We sought to empirically evaluate whether such personalization of risk estimates would affect the perceived relevance of the provided risk statistics.

Method: We surveyed 3315 people age 55 and older from an online panel and asked them to imagine being diagnosed with carotid artery stenosis. Participants viewed a 4 page segment of an online decision aid designed for patients considering carotid artery surgery to reduce stroke risk. The decision aid section provided estimates of the risk of stroke with medical therapy only from 30 days through 5 years in multiple pictograph formats and then compared these risks to the risks of stroke and death following carotid artery surgery. While the risks with medical therapy were consistent for all participants, we randomized participants to view estimates of the risks with surgery that were either (a) the risks of the average patient or (b) tailored based on 6 risk factors (including female gender). We then compared treatment intentions, perceived risk, and ratings of the personal applicability of the information between groups.

Result: Preferred treatment selections did not differ based on personalization, and perceptions of operative risks increased when more risk factors were present as expected. Surprisingly, however, we also observed significant variations in perceived information relevance based on risk factors. While those at average or higher risk (2 or more risk factors) rated the information as more applicable to them than the untailored group (Mean Rating=3.36 vs. 2.60 on a 7 point scale, p<0.001), respondents in the personalized group who were lower than average risk (0 or 1 risk factors) rated the risk information as significantly less personally applicable when compared to participants in the untailored condition (Mean Rating=2.32 vs. 2.60, p<0.001).

Conclusion: Tailoring risk estimates can increase perceived relevance among those who have multiple risk factors, but it can lower perceived relevance among lower-risk individuals. Participants responded as if the act of stating that no risk factors applied to them meant that the resulting risk estimates also were not personally applicable. This effect, if replicated in patient populations, casts doubt on the advisability of providing tailored risk estimates to low risk populations.

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37. GIRLS' INTERPRETATION OF A HPV VACCINATION LEAFLET: A QUESTIONNAIRE STUDY (DEC)

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Purpose: In the Netherlands 12-year-old girls are offered the HPV vaccine free of charge and are legally entitled to take their own decision about vaccination uptake. To inform girls about HPV vaccination, they are sent a standardized information leaflet prior to the vaccination offer. While it is important that girls have decision-relevant knowledge – and can make an informed choice about uptake - it is unknown to which extent relevant information, e.g. the extent and duration of protection against cervical cancer through vaccination, is understood after reading the leaflet.

Method: A questionnaire was completed by 11 to 14-year-old girls at school. To assess whether completing a pre-test would trigger attentively reading the leaflet, respondents were randomly assigned to one of two groups: the intervention group completed a pre-test, read the leaflet and completed a post-test; the control group only read the leaflet and completed a post-test. In both pre and post-test we assessed knowledge about HPV (statements to be answered with 'true' or 'false'); attitudes; and intentions towards having the vaccination. Knowledge scores ranged from 0-10, with scores of ≥ 6 indicating sufficient decision-relevant knowledge.

Result: The response was 237/287 (83%). After reading the leaflet the average knowledge score in the intervention group increased from 5.3 to 7.2 out of 10 (P<0.001). In the post-test 37% knew that HPV vaccinations do not protect completely against cervical cancer and 29% answered correctly that we don't know for a fact that HPV vaccinations will protect against cervical cancer for a life-time. The rate of informed intentions about uptake increased from 21.9% at pre-test to 68.1% at post-test. The average knowledge score in the control group of 6.3 in the post-test was significantly lower than that of the intervention group. 36.3% of uptake intentions in the control group could be considered informed.

Conclusion: This study showed that although an information leaflet had a positive effect on the correspondence between attitude and intention, and on girls' knowledge of HPV, knowledge about the degree and duration of protection against cervical cancer remained low. Inclusion of a control group allowed us to assess the effect of a pre-test on knowledge scores. By editing the leaflet and emphasizing these aspects, awareness of the degree and unknown duration of protection can be raised.

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38. THE DELIVERY OF NON-EVIDENCE BASED PREVENTIVE SERVICES DURING PERIODIC HEALTH EXAMINATIONS (DEC)

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Purpose: Preventive services rated C, D, or I by the US Preventive Services Task Force (i.e., those without evidence for routine use) may take up valuable clinical encounter time during periodic health examinations (PHE). Using direct observation methods, we examine patient-physician discussion of and physician recommendation for nine non-evidence based preventive services during PHEs.

Method: Study physicians (N=64) are internal medicine or family physicians practicing with a salaried medical group in SE Michigan. Study patients (N=484) are insured, aged 50-80 years, and due for colorectal cancer screening at time of a scheduled PHE. Office visit audio-recordings were evaluated for patient-physician discussion of nine non-evidence based preventive services (clinical breast exam, self breast exam, hormone replacement therapy, coronary heart disease screening, dementia screening, illicit drug use screening, lung cancer screening, physical activity counseling, prostate cancer screening, skin cancer prevention and screening), whether the topic was raised by the patient, and whether the physician recommended the service to the patient in absence of evidence of symptoms or prior disease history.

Result: Patient participants are on average aged 59 years, 65% female and 66% white. The non-evidence based services most likely to be discussed during PHEs were prostate cancer screening (93% of males), physical activity (77%), and coronary heart disease screening (64%). Skin cancer prevention (6%) and dementia screening (9%) were the topics least likely to be discussed. When discussed, patients were relatively more likely to raise dementia screening (57% of discussions), hormone replacement therapy (40%), lung cancer screening (33%), and skin cancer prevention (31%). Physicians were most likely to recommend or deliver prostate cancer screening (87% of males), physical activity counseling (46%), clinical breast exam (39% of females), and coronary heart disease screening (26%).

Conclusion: Some non-evidence based preventive health services are routinely discussed by patients and physicians during PHE. When discussed, these topics are raised by both physicians and patients. Even in the absence of symptoms or personal disease history, the rate of physician recommendation for several non-evidence based services is high. The routine provision of non-evidence based services may decrease time available during the PHE for the delivery of evidence-based preventive services as well as other clinical concerns.

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39. COMPREHENSIVE ASSESSMENT OF MEN'S PREFERENCES FOR PROSTATE CANCER CARE (DEC)

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Purpose: Understanding men's preferences for prostate cancer treatment is central to achieving the promise of shared decision-making in urologic oncology. Our objective was to evaluate the reliability and construct validity of a clinically relevant and comprehensive measure of men's preferences for prostate cancer treatment.

Methods: A cross-sectional sample of men newly or previously diagnosed with localized prostate cancer (n=393) completed the Values Insight and Balance Evaluation scales (VIBEs), a Time Trade Off (TTO) utilities measure, and demographic and clinical questions. VIBEs is a 46-item measure of prostate cancer treatment preferences developed from an explicitly derived conceptual framework and interviews with prostate cancer patients, their spouses, and relevant clinicians. We determined internal consistency using Cronbach's alpha, and conducted confirmatory factor analysis (CFA) using a robust maximum likelihood approach for non-normal distributions. We also calculated Pearson correlations between VIBEs subscale scores and utilities elicited using the TTO and conducted a known-groups analysis of the VIBEs comparing active treatment and watchful waiting.

Results: Participants ranged in age from 40 to 89. Most were Caucasian (84%), married or living with a partner (61%), and had received active treatment (e.g., surgery, radiation) (78%). Internal consistency

coefficients ranged from 0.71 to 0.94, with most above 0.80. CFA revealed that eleven VIBEs subscales fit the data well based on a non-significant chi-square statistic (p=0.13), an RMSE<0.05 (RMSE=0.03), and a CFI>0.95 (CFI=0.99). Standardized estimates for subscale domains ranged from 0.48 to 0.88. There were significant correlations between TTO subscales of urinary, sexual, and bowel function and corresponding VIBEs subscales (p =0.0021-0.0285). In a known-group analysis of active treatment versus watchful waiting, the active treatment group had significantly higher scores on the VIBEs Survival subscale than the watchful waiting group (p=0.0007).

Conclusions: Eleven domains represent a strong conceptual structure for the interpretation of VIBEs subscale scores in this population. The domains include general concerns (e.g., responsibilities, self-image) as well as prostate cancer specific considerations (e.g., urologic function). While extensive measurement of patient preferences is not required for all medical decisions, a full assessment of patient values is appropriate for prostate cancer where choices are complex and will have long lasting consequences. Evidence supports the VIBEs as a reliable and conceptually strong measure of preferences with potential to improve shared decision making.

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40. DEVELOPMENT AND VALIDATION OF A GLAUCOMA SPECIFIC UTILITY ELICITATION INSTRUMENT (DEC)

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Purpose: We used multi-attribute theory to develop a utility elicitation instrument for people with glaucoma based on the National Eye Institute-Visual Functioning Questionnaire (NEI-VFQ), a vision specific quality of life instrument frequently used in clinical trials. We evaluated the construct validity of the instrument by comparing estimated utility values to glaucoma severity as measured by mean deviation (MD).

Methods: NEI-VFQ responses from 99 patients with a range of glaucoma severity were analyzed qualitatively to identify the 12 items most responsive to visual field status. We then constructed a conjoint interview and administered it to 48 people with glaucoma, identifying the 6 items of greatest importance. With these results, we constructed a web-based interview using standard gamble (SG) and visual analog scales (VAS) and administered it to a community sample of 404 people. SG results were analyzed using regression methods and the VAS results were used to weight intermediate responses. We assessed validity by applying the weights to the NEI-VFQ responses of 709 participants and plotting these against MD. The instrument would be considered valid if greater disutility was associated with worse MD.

Result: Disutility for people with glaucoma was determined to be measured by three items, with maximum utility loss shown in parentheses: being able to read normal print (0.11); having to stay home due to vision (0.125); and needing help with activities due to vision (0.036). The results of our construct validity analyses are presented in the accompanying table. As expected, utility loss was associated with increasing severity of disease in the best seeing-eye, indicating excellent construct validity.

Conclusion: We have developed and validated an instrument that can be used to estimate the utility loss in people with glaucoma based upon the NEI-VFQ. When used in clinical trials, the instrument will provide an estimate of the utility loss associated with the progression of glaucoma, supporting cost-utility studies of

glaucoma progression and preventions.

Mean Deviation (dB)	Best	Seeing	Eye	Worst	Seeing	Eye
	N=	Dis-Utility Mean (SD)	Median	N=	Dis-Utility Mean (SD)	Median
+5 to 0	157	.020 (.031)	0	49	.021 (.031)	0
0 to -4	385	.023 (.036)	0	279	.021 (.033)	0
-4 to -8	103	.036 (.048)	.032	159	.024 (.036)	0
-8 to -12	39	.062 (.069)	.047	98	.031 (.047)	.032
-12 to -16	18	.060 (.044)	.055	54	.045 (.052)	.032
-16 to -20	0	--	--	37	.045 (.050)	.032
-16 to -30	7	.078 (.066)	.102	0	--	--
-20 to -30	0	--	--	33	.061 (.064)	.047

41. THE QUALITY OF DECISIONS ABOUT BREAST CANCER SURGERY (DEC)

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Purpose: To evaluate decision quality in patients deciding between lumpectomy and mastectomy, by measuring decision-specific knowledge, concordance between goals and treatment, and involvement in decision making.

Method: A cross-sectional survey was conducted in early stage breast cancer patients 1 to 3 months after surgery at four sites. The survey covered facts about surgical options, goals and concerns related to surgery, and interaction with providers. A knowledge score (0 to 100%) was calculated, and characteristics associated with knowledge were identified using multivariable linear regression. A multivariable logistic regression model of treatment was developed, including clinical variables and patients' goals/concerns. The model-predicted probability of mastectomy was computed for each patient. Patients with a predicted probability >=0.5 who had mastectomy and those with a predicted probability <0.5 who had lumpectomy were classified as having care concordant with their goals. A concordance score (0 to 100%) was calculated as the proportion of patients who received concordant care.

Result: 266 patients completed surveys (response rate 60%). The mean overall knowledge score was 71.3% (SD 15.7). Most (78.6%) knew that breast conservation and mastectomy have equivalent survival. A minority (37.6%) knew that risk of recurrence is higher with breast conservation. College education (beta=7.95, p=0.0004), white race (beta=7.30, p=0.04), and having lumpectomy (beta=6.77, p=0.008) were associated with higher knowledge. The desires to "remove your breast for peace of mind" (OR 2.08, 95% CI 1.66, 2.59), "avoid radiation" (OR 1.22, 95% CI 1.03, 1.43), and "keep your breast" (OR 0.80 CI 0.68, 0.94) were associated with treatment. Most patients (90.9%) had treatment that was concordant with their goals,

but women whose goals predicted lumpectomy were more likely to have concordance (93.7%) than women whose goals predicted mastectomy (82.8%, p=0.02). According to patient report, providers discussed lumpectomy more frequently than mastectomy (91.4 vs. 74.8% of patients) and mentioned the advantages of lumpectomy more often than the advantages of mastectomy (86.1% vs. 50.4% of patients).

Conclusion: Breast cancer patients had fairly good knowledge about surgery. Patients with lower education had more knowledge deficits. Most patients had treatment concordant with goals, but women who preferred lumpectomy were more likely to have concordant treatment. Providers tended to emphasize lumpectomy and its advantages in discussions with patients.

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42. DOES MESSAGE SOURCE AFFECT PARENTS' RESPONSES TO ADS PROMOTING HPV VACCINE FOR BOYS? (DEC)

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Purpose: Most parents report that they heard of HPV vaccine through paid drug company advertisements, but no research has established whether these self reports are accurate. We conducted an experiment to examine whether parents could accurately identify the source of ads promoting HPV vaccine for boys and whether the impact of ads varied by source.

Method: A national sample of 547 parents of adolescent males ages 11-17 years completed the online between-subjects experiment. The experiment presented parents with an advertisement encouraging HPV vaccination for boys with a logo from a randomly assigned message source (Merck, Gardasil, Centers for Disease Control and Prevention (CDC), American Cancer Society (ACS), or no logo). Parents offered three evaluations (trust, liking, and motivation for vaccination) while viewing the ad. After the ad was removed from the screen, parents indicated who they believed sponsored it.

Result: Nearly half of parents who viewed an advertisement containing a logo incorrectly identified the message source (43%). More parents incorrectly identified the source of non-drug company ads (63%) compared to drug company ads (26%, *p*<.001). The majority of parents who saw the logo-free ad believed it was created by a drug company (59%), and they often made the same attribution for CDC and ACS ads. Among parents who correctly identified ad source, viewing a drug company ad decreased their motivation to vaccinate their sons. This effect was mediated by reduced liking of and trust in the ads.

Conclusion: Parents had difficulty identifying the source of ads they had just viewed. Parents were more accurate in recognizing drug company ads, primarily because they tended to assume that ads were from drug companies. Future research should focus on identifying cues other than logos that are more effective for conveying message source. Moreover, public health organizations may need to take special measures to emphasize that their messages are not sponsored by drug companies.

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43. HOW INITIAL PUBLIC OPINION ON VACCINATION AFFECTS VACCINATION ADHERENCE DURING INFECTIOUS DISEASE OUTBREAK: AN AGENT-BASED SIMULATION STUDY IN A RANDOMLY GENERATED SOCIAL NETWORK (DEC)

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Purpose: One of the most striking public health achievements has been the near eradication of vaccine-preventable diseases. However, studies suggest that the number of people deciding to vaccinate has been decreasing. Because of the novelty and involved uncertainty of the threat of a pandemic like H1N1, consumers' opinions are likely to be shaped by social influence processes. Therefore, understanding the impact of low-level vaccination support within a complex social network is critical to efficient deployment of vaccination in the public both from a theoretical and policy-making perspective.

Method: We conducted an agent-based simulation study, in which we attempted to explore factors that may affect the vaccination adherence rate in a randomly generated social network modeling connections among both friends and family members. Drawing upon behavioral models in individual decision making, our simulation aimed to explore the impact of social influence. In the simulation, agents contacted each other according to a specified contact rule and updated their individual opinions according to a specified decision rule that integrated the opinions of their fellow neighbors who were contacted. Each agent was associated with a four-member family and randomly connected to at most seven friends. We systematically varied (a) initial percentage of agents favoring vaccination, b) how agents regarded expertise (decision rule), and (c) whether agents contacted their friends and to what extent (contact rule).

Result: It is more likely to

·   form negative opinion towards vaccination within the entire population of consumers when all of them ignore expertise entirely (Figures 1 vs. 2; more than 30% of initial population favoring vaccination is needed (Figure 1));

·   form positive opinion within the entire population if communications exist among both friends and family members (Figure 2 vs. 4; 70% of initial population is sufficient (Figure 2)); and

·   form positive opinion within the entire population if all consumers entirely rely on expert's opinion among their contacts (comparing Figures 1 – 3; 60% of initial population is sufficient (Figure 1)).

Conclusions: Our agent-based simulation model has the potential to play the proof-of-the-concept role to assist policy-makers' investigation of the effect of individual support on the possibility of vaccination adherence in a complex social network. Therefore, it may assist scenario analysis on resource allocation and personnel planning for mass vaccination campaign.

Contact Rule: Communicate with both Family Members and Friends
Decision Rule: Unit Weight Model

Y-axis: Fraction of Final Population Favoring Vaccination
X-axis: Fraction of Initial Population Favoring Vaccination

Figure 1

Contact Rule: Communicate with both Family Members and Friends
Decision Rule: Weighted Additive Model

Y-axis: Fraction of Final Population Favoring Vaccination
X-axis: Fraction of Initial Population Favoring Vaccination

Figure 2

Contact Rule: Communicate with both Family Members and Friends
Decision Rule: Follow the Expert

Y-axis: Fraction of Final Population Favoring Vaccination
X-axis: Fraction of Initial Population Favoring Vaccination

Figure 3

Contact Rule: Communicate with only Family Members
Decision Rule: Weighted Additive Model

Y-axis: Fraction of Final Population Favoring Vaccination
X-axis: Fraction of Initial Population Favoring Vaccination

Figure 4

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44. ENCOUNTERS WITH "GODS ON THEIR HIGH THRONES IN HEAVEN": PATIENT PERCEPTIONS OF WHAT IT TAKES TO PARTICIPATE IN SHARED DECISION MAKING (DEC)

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Purpose: This study explored a critical gap in shared decision making research – patient perceptions of what it takes to engage in the communication behaviors necessary for shared decision making.

Method: We conducted a focus group study. Discussion centered on participants' perceptions of communicating with physicians (e.g., asking questions, discussing preferences, disagreeing with a recommendation) in the context of preferences sensitive decisions. Participants (N=48) were primary care patients who were at least 40 years old (Mean = 64.7, SD = 12.1). We conducted a total of 6 focus groups, which were transcribed and analyzed thematically.

Result: Participants' experiences and perceptions were grouped around four major themes. (1) Not challenging the physician helps protect the patient:

- Participants described not wanting to challenge the physician by asking too many questions, for fear that they may receive lower quality care later.
- Fearing retribution for being a difficult patient, participants described a high dependency on the good will of the clinician and concern that they will be dismissed as non-compliant and receive worse care if perceived as too assertive.

(2) Being deferential to protect self-interest:

- Participants talked of wanting to conform to normative definitions of the patient role, wanting to be deferential, not "displeasing" or "disappointing" the doctor, by asking too many questions, or disagreeing with a recommendation.
- Participants described remaining passive in order to ensure high quality care.

(3) Patients work to fill information gaps:

- Not being able to rely on physicians for decision support, participants described doing their own research, often unannounced to the physician.

(4) Bringing support to the consultation:

- Described a common strategy to cope with the difficulty of assimilating information at a high pace in time pressured consultations.

Conclusion: Participants voiced a strong desire to share important clinical decisions, but are reluctant for fear of being categorized as difficult patients, less worthy of attention and therefore less likely to receive high quality care. This perception of being in jeopardy has not been previously described and physicians may not be aware of the need to create a zone of safety for shared decision making to become routine.

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45. ASSESSING THE QUALITY OF BREAST CANCER SURGERY DECISIONS IN A NATIONAL MEDICARE SAMPLE (DEC)

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Purpose: Many studies of decision making focus on younger populations who receive care in academic medical centers. The purpose of this study was to examine decision quality in a national Medicare population.

Methods: A cross sectional survey of breast cancer patients who had mastectomy or lumpectomy were identified through Medicare records. Patients had to be at least 66 yrs old and to have been continuously enrolled in fee for service Medicare for at least a year at the time of their surgery. The mailed survey contained items covering knowledge of treatments and outcomes, involvement in the interaction, and other aspects of the decision. Here, we present total knowledge scores (on a scale of 0 to 100%) and involvement scores (on a scale of 0 to 100%) with higher scores indicating more knowledge and more involvement. We examined factors associated with knowledge using linear regression.

Results: We received 914 responses (507/667 (76%) lumpectomy and 407/557 (73%) mastectomy). The sample was 91% White, median age 76, and 18% reported a college degree or more. Mastectomy patients were more likely to be non White, older and have lower education compared to lumpectomy patients. The

total knowledge score was 53% (SD 20%) and this varied by treatment (49% for mastectomy and 56% for lumpectomy patients (p<0.001)). About half (54%) understood that survival was the same for mastectomy and lumpectomy. Only 29% knew that waiting four weeks to make a decision would have little or no effect on the outcome. On average, patients reported limited involvement in decisions, and this did not vary by treatment (39% for lumpectomy and 43% for mastectomy, p=0.10). For example, while 78% reported a discussion of pros, only 34% reported discussion of cons of the treatments. Only 26% reported that their providers asked them for their treatment preference. Several factors were associated with higher knowledge scores in the regression model, including younger age, higher education, having lumpectomy and higher involvement score.

Conclusions: Women with breast cancer in Medicare had signficant knowledge gaps regarding treatment options and outcomes. Participants report variable involvement in decisions. Older patients and those with lower education may need additional support in order to ensure they are informed and involved in decisions.

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46. THE IMPACT OF SUBJECTIVE LIFE EXPECTANCY ON HEALTH STATE VALUATION WITH THE TIME TRADE-OFF METHOD (DEC)

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Purpose: To investigate the influence of patients' own subjective life expectancy on their responses in time-trade off (TTO) questions used to value the patients' own health states.

Methods: A sample of 145 patients with different severity levels of diabetic retinopathy were asked a set of TTO questions based on the statistical expected remaining survival for the age group of the respondent rounded to the closest ten. Next, the patients were asked how many years they were expecting to live themselves. The difference in years between the subjective life expectancy and the time used in the TTO questions was calculated and tested towards the results from the TTO questions in a univariate as well as in a multiple regression model including possible confounders (age, sex, HbA1c, duration of diabetes, type of diabetes, cardiovascular disease, nephropathy, neuropathy, retinopathy, smoking, education level, marital status).

Results: Of the 145 patients, 57.2% expected to live shorter than the time perspective used in the TTO question while 15.9% expected to live longer. In the remaining 26.9%, the statistical life expectancy used in the questions was equal to the life expectancy of the patients. The difference in years between the subjective and statistical life expectancy had a significant effect on the TTO valuation in the univariate (β=0.016 , p<0.001) as well as the multivariate model (β =0.010, p<0.001).

Conclusion: Patients' own expectancies about their remaining life years influence their responses in the TTO questions. This suggests that the use of other time perspectives than the subjective life expectancy of the respondents could result in biased TTO valuations.

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47. THE DEVELOPMENT OF A DECISION-AID TO GUIDE COUNSELING OF PARENTS FACING IMMINENT EXTREME PREMATURE DELIVERY (DEC)

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Purpose: Greater parental autonomy in decision-making at lower limits of neonatal viability warrants effective communication of complex information at a time of high stress. Transparent decision-aids may assist this goal. Our objective was to develop and pretest a decision-aid to help parents facing extreme premature delivery during counseling regarding delivery room resuscitation.

Method: Semi-structured interviews were conducted until saturation was reached, to define the content and presentation formats of a decision aid. Interviews with health care professionals and with parents of premature infants <26 wks GA identified items and formats of information valued by parents when making resuscitation decisions. Standard methods of item development, selection and reduction distilled items into a novel decision aid. Validity was evaluated by testing the hypothesis that an effective decision-aid would improve knowledge in two groups: Parents with a history of extreme prematurity ("experienced") and healthy women without prior knowledge of prematuirty ("naïve"). Sample size estimations were 10 per group (power 90%, α 0.05, with clinically relevant knowledge increment of 30%)

Result: 31 health care workers (nurses, neonatologists, obstetricians) and 30 parents were interviewed to obtain saturation of themes. Interviewees felt visual formats to present complex information on survival, short-term morbidities, and long-term outcomes facilitated their own preparation, recall, and understanding. Parents also stressed a need for numeric figures. Accordingly, a decision-aid as a set of cards with pictures and horizontal pictographs to show survival rates and complications were designed. Pictographs depicted survival rates from 22+0 to 25+6 wks and risk for the individual components of neurodevelopmental impairment at 24 months. Pre- and post-test knowledge in a simulated counseling session showed significant improvement in 13 "experienced" parents (p=0.04); and an even greater improvement in 11 "naïve" (p<0.0001). Moreover, in a 5-question survey, most participants found the cards useful and easy to understand.

Conclusion: A decision-aid for parents facing extreme premature delivery may improve their understanding of complicated information during antenatal counseling.

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48. DOES DIAGNOSIS MATTER IN END-OF-LIFE DECISION MAKING IN THE HOSPITAL? (DEC)

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Purpose: In the Netherlands one third of all deaths (n=35,000 per year) occurs in a hospital. There is growing interest in palliative care and adequate end-of-life decision making in hospitals. In clinical practice palliative care is mainly focused on the cancer patient, although dying trajectories of non-cancer patients are known to be less predictable. In this study we investigated similarities and differences in end-of-life decision making for cancer and non-cancer patients in the hospital.

Method: All general wards (17) and a specialised unit for acute palliative care in a Dutch university hospital participated in this study. For every patient older than 18 years who had died at one of the participating wards after having been admitted at least 6 hours prior to death, physicians were asked to complete a written questionnaire.

Result: Between June 2009 and February 2011, we received 226 questionnaires. The median age of the deceased patients was 67 years, 56% were male and 49% had cancer. The median length of the last hospitalization was 11 days. During the last month of life, physicians more often discussed end-of-life treatment options with cancer patients than with non-cancer patients (euthanasia: 22% vs 6%*; palliative sedation 41% vs 12%*; intensive symptom control 43% vs 17%*). DNR policy was also more often discussed with cancer patients: 51% vs 34%*. Physicians were aware of the imminence of death in the large majority of all patients (89% and 83%); no differences between both groups were found in the moment of such awareness. However, physicians discussed imminent death with 67% of cancer patients and with 35% of non-cancer patients*.In the dying phase cancer patients were more often than non-cancer patients treated with opioids (89% vs 66%*) or continuous palliative sedation therapy (35% vs 19%*).

Conclusion: Physicians often recognize imminent death in cancer patients as well as in non-cancer patients. Nevertheless discussion of imminent death and end-of-life decision making is more common in cancer patients than in non-cancer patients. Shared decision making at the end of life could be further improved, especially for non-cancer patients. * Chi-square, p< 0.05

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49. "DON'T KNOW" RESPONSES TO RISK PERCEPTION MEASURES: IMPLICATIONS FOR UNDERSERVED POPULATIONS (DEC)

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Purpose: Risk perceptions vary by multiple sociocultural factors that are associated with both numeracy and health disparities (e.g., race/ethnicity). Variations in the wording and format of risk questions can also affect responses. However, few risk perception measures include a "don't know" option. Assessing how "don't know" responses relate to sociocultural factors may help identify potential challenges in measuring perceived risk and help elucidate how diverse populations conceptualize health risk information.

Methods: Data from the 2005 National Health Interview Survey were analyzed (N=31,202); only participants age 18+ with no prior cancer diagnosis were included. Perceived comparative risk of colorectal cancer was assessed. Although not an explicit response choice, 8.1% (N=2,190) of the 29,122 participants who answered the perceived risk question indicated "don't know." Chi-squared and t-tests were used to examine the relationship between answering "don't know" and several sociocultural variables associated with cancer disparities. Multivariate logistic regression examined the occurrence of "don't know" responses based on those variables that were statistically significant in the univariate analyses.

Results: Univariate analyses identified multiple characteristics that were significantly associated with responding "don't know." Most (7 of 11) remained significant in multivariate analyses. Being older (vs. younger), Black/African American (vs. White), never married (vs. married or vs. divorced), not born in the U.S. (vs. born in the U.S.), having less than a 4-year degree (vs. having a 4-year degree), and not reporting a family history of colorectal cancer (vs. reporting a family history) were associated with increased odds of responding "don't know." Analyses were repeated using the 2005 Health Information National Trends Survey and a dataset comprised of inner city racial/ethnic minorities. Although statistical significance was not consistent across all variables and all datasets, the overall pattern of responses were similar.

Conclusions: Participants belonging to several historically disadvantaged groups were more likely to indicate that they did not know their risk of colorectal cancer. This suggests that measures of perceived risk that do not include a "don't know" response option may not adequately capture risk beliefs among some members of underserved populations. This is especially problematic for interventions that target perceptions

of risk. Research investigating the cognitive and behavioral implications of being unwilling or unable to provide a risk estimate on receptivity to health information and behavior are needed.

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50. THE IMPORTANCE OF INTERACTIONS IN DETERMINING HOW COMMUNITY PRACTITIONERS DIAGNOSE AND TREAT ACUTE RESPIRATORY TRACT INFECTIONS (DEC)

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Purpose: In studies of how practitioners weight clinical findings in making judgments about management or diagnosis, interactions among the findings are usually ignored or not analyzed. To determine if interactions influenced the decision to give antibiotics to patients presenting with symptoms of acute respiratory infections (ARI), we analyzed the first order interactions in community practitioners' decisions to prescribe antibiotics.

Method: 101 community practitioners in Denver, CO estimated how likely they were to prescribe antibiotics in response to each of 20 paper cases of patients presenting with ARI. They also judged the likelihood that the patient had each of 4 clinical diagnoses (viral ARI, pneumonia, bronchitis, strep throat). Values of clinical findings were expressed at 2 levels (high/low or present/absent), following a fractional factorial design. We used judgment analysis (lens model) to determine the weight (size of the effect) of each clinical finding on the decision to prescribe antibiotics. Weights were calculated for each individual practitioner.

Result: In the decision to prescribe antibiotics, cue interactions outweighed all main effects for 41% of the 101 practitioners. The two most highly weighted interactions were temperature x duration (positive weighting) and temperature and runny nose (negative weighting). In diagnosing the cause of the illness, interactions outweighed the main effects for 50-60% of the participants, depending on the diagnosis.

Conclusion: We found that interactions between clinical findings were often more important than main effects in predicting practitioners' decisions about whether to give antibiotics in ARI. One important interaction was runny nose x temperature, which reduced the likelihood of prescribing antibiotics - a logical effect since runny nose is a feature of viral ARI (though not in the case of influenza). Temperature x long duration had a positive effect on prescribing antibiotics, consistent with bacterial pneumonia and sinusitis, but not influenza. Thus, interactions may amplify or attenuate the effect of the clinical finding on clinical judgment, as duration of illness here amplifies the effect of temperature. Since we do not know how practitioners process clinical findings (e.g. pattern recognition, analytical, narrative, cue weighting), understanding the role of interactions will need further research. Interactions may be important in teaching how clinical findings relate to diagnosis and management.

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51. WITHDRAWN- NEUROTICISM IS ASSOCIATED WITH SELF-RATED HEALTH ON THE EQ-5D (DEC)

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Purpose: Neuroticism, a personality trait associated with negative affect, is strongly related to perception of health, self-assessed health, and numerous measures of mental and physical health. The EQ-5D descriptive system is a generic form intended as an objective measure of health status. It has five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), each with three levels (no, some, or extreme problems), describing 243 different combination health states. The objective of this study was to assess the association between neuroticism, as expressed by a trait measure, and self-descriptions of health state using the EQ-5D.

Method: We collected descriptions of own health on the EQ-5D and the 12-item neuroticism scale of the NEO Five Factor Inventory (NEO FFI) from a representative sample of 2279 persons from the adult Norwegian population. We calculated Pearson's *r* between neuroticism (Z-scores based on Norwegian norms) and scores in the five EQ-5D dimensions. We then used multiple linear regression to predict US and Danish EQ-5D tariff values corresponding to the respondents' EQ-5D profiles, using age, sex, and neuroticism scores as predictors.

Result: Neuroticism was significantly correlated with all five EQ-5D dimensions (mobility .174, self-care .151, usual activities .206, pain/discomfort .216, anxiety/depression .409 ($p<.001$ for all). When predicting US and Danish EQ-5D tariff values, age (+1 year = -.002 in both), female sex (-.042 and -.050, respectively) and neuroticism score (+1 SD = -.058 and -.071, respectively) were significant predictors ($p<.001$ for all).

Conclusion: Neuroticism was a strong predictor of EQ-5D tariff values. The association between neuroticism score and EQ-5D dimension scores was strongest for anxiety/depression. Our findings indicate that the personality trait (or, at least, the measure of it) is substantially influenced by health status, that self-ratings on the EQ-5D are influenced by neuroticism, or both. Our cross-sectional study is unsuited to determine the causal relationship between neuroticism and self-ratings of health. The bi-directional relationship should be investigated further using a longitudinal design, since it could prove important for the interpretation and validity of both individual level and patient-group level EQ-5D data.

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52. WITHDRAWN - CONCRETENESS AND SIMPLICITY EXPLAIN THE EFFECT OF NUMERICAL AND GRAPHICAL RISK FORMATS ON PERCEIVED LIKELIHOOD AND CHOICE (DEC)

Danielle R.M. Timmermans, PhD, EMGO Institute/ VU University Medical Center, Amsterdam, Netherlands and J. Oudhoff, PhD, VU University Medical Center, Amsterdam, Netherlands

Purpose: A good understanding of risk information is essential part of informed decision making about health and wellbeing. We investigated to what degree the perception and comprehension of quantitative risk information depends on the features of different numerical and graphical formats used in view of concreteness and their simplicity.

Method: . One-hundred ninety two students from the Free University of Amsterdam participated in the study. Three different numerical formats were used, i.e. percentages ('X%'), frequencies with round decimal denominators ('X in 100/1000'), and frequencies that are standardised to the smallest numerator ('1 in X'). These formats differ in the degree by which they refer to concrete frequencies and in their simplicity in conveying a numerical ratio. For the graphical formats, we used bar charts and icon charts. To focus on the quantitative aspect of risk information, we used games of chance. We used an experimental mixed 3x2x2 design with two between factors and one within factor. Measures for understanding information: perceived likelihood, choice preference, comparisons of different likelihoods. Process measures: response times, subjective evaluation of information. We also assessed participants' numeracy

Result: The effects of different numerical formats are more pronounced than those of graphical representations. The numerical format '1 in X' is perceived to convey larger likelihoods than the formats 'X in 100' and percentages. Likelihoods shown as '1 in X' took less time to interpret and, together with percentages, they were deemed relatively easy to imagine. Adding a graphic and especially a bar chart yielded smaller perceived likelihoods, while the participants found it easier to imagine the likelihood information when an icon chart was added. Notably, the effect of adding a graphic on perceptions was stronger among people with low numeracy.

Conclusion: Perception and interpretation of likelihood information depends on the concreteness and simplicity of the risk formats used. The numerical format '1 in X' may then be favourable as it is concrete and simple. While using percentages is often deemed unfavourable as it would be less concrete than equivalent frequencies, this argument is not supported by our findings. The effect of using of graphics on understanding is likely to be small, which may be larger for people with less numeracy skills.

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53. SOURCES OF CONFLICTING MEDICATION INFORMATION: ASSOCIATIONS WITH DEMOGRAPHIC FACTORS AND MEDICATION ADHERENCE (DEC)

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Purpose: When chronic disease patients are prescribed a medication, they often supplement the information given to them by their physician by consulting additional sources. When patients seek information from more than one source, the opportunity to encounter conflicting information, defined as contradictory information from two or more sources about a particular medication topic, arises. Our purpose is to determine whether arthritis patients are exposed to conflicting medication information, document which sources provide patients with conflicting information, and explore whether conflicting information is associated with patient medication adherence.

Method: All data were collected as part of the Information Networks for Osteoarthritis Resources and Medications (INFORM) Study, which assessed the information-seeking behaviors of osteoarthritis and rheumatoid arthritis patients (n=328). Using an online survey, patients indicated how often they had received conflicting information about 12 medication topics; summary scores ranged from 1 ('never received') to 4 ('often received'). Patients also indicated sources of conflicting information and completed demographic and clinical questions as well as a visual analog scale for medication adherence that ranged from 0-100, with lower scores indicating worse adherence. SPSS was used to calculate Pearson correlations to explore the relationship between conflicting medication information and demographic/clinical variables. Each demographic/clinical variable that significantly correlated ($p<.10$) with conflicting information was entered into a regression model to predict medication adherence.

Result: A majority of patients (80.1%) received conflicting medication information and were most likely to receive conflicting information about side effects and proper dosage. Two doctors (27.4%), media sources (21.6%), and the Internet (20.7%) were the most common sources of conflicting information. Younger patients, non-white patients, patients who perceived that their medication regimen was more complex, patients who reported that their arthritis was more severe, and patients who sought more information received greater amounts of conflicting information. The regression model revealed that more information source use (B=.22 $p<.01$), lower perceived medication regimen complexity (B=-.17, $p<.05$), and less conflicting information (B=-.13, $p<.05$) were associated with better medication adherence.

Conclusion: Conflicting medication information is problematic for arthritis patients because it is associated with worse medication adherence. The relationship between use of information sources, conflicting

information, and medication adherence deserves greater attention. Interventions designed to help patients reconcile conflicting information from multiple sources may be warranted.

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54. BMI, CANCER RISK PERCEPTION, AND PREVENTIVE BELIEFS (DEC)

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Purpose: To examine differences in cancer risk perception and preventive cancer beliefs by body mass index (BMI).

Method: We used the 2007 Health Information National Trends Survey random digit dialed data. These data include 3104 (unweighted) responses (from 4092 total) for those who report never having been diagnosed with cancer and who provided information on BMI. We used frequencies and weighted percentages to explore associations between BMI categories of obese (30+), overweight (25-<30), and normal/underweight (<25) by perceived likelihood of getting cancer (somewhat/very high vs somewhat/very low/moderate), frequency of cancer worry (often/all the time vs sometimes/rarely/never), agreement cancer is caused by lifestyle (strong/somewhat agreement vs strong/somewhat disagreement), and agreement there is not much you can do to lower cancer chances (strong/somewhat agreement vs strong/somewhat disagreement).

Result: Those overweight and obese were slightly more likely than those normal/underweight to think they had a high chance of developing cancer (18% vs 14%; p<0.0001)). Obese respondents were more likely than other BMI groups to worry often/all the time about getting cancer (10% vs 5-6%; p<0.0001). Among obese individuals, 65% classified themselves as being overweight; 25% believe a lot that obesity is inherited. BMI groups did not vary in: reporting the percentage who felt physical activity or exercise decreases the chances of getting some types of cancer (62-64%); agreement that cancer is most often caused by a person's behavior or lifestyle (49-51%); or agreement that there's not much you can do to lower your chances of getting cancer (25-26%). There was no difference across BMI groups in modifiable behavior beliefs (12-14%), defined as those who agreed there's not much you can do to lower cancer chances, and disagreed that cancer is most often caused by a person's behavior.

Conclusion: Healthy lifestyle has been associated with the reduction in risk of certain cancers. Overweight and particularly obese persons are more likely to report worry or perceive a high chance of getting cancer, but do not appear to have internalized the potential for modifiable lifestyle changes that might reduce their risk. Educating overweight and particularly obese individuals about their ability to potentially reduce their cancer risk may help motivate uptake of a healthy lifestyle.

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55. THE EFFECT OF DIFFERENT PROPENSITY REGRESSION TECHNIQUES ON PREDICTIVE ACCURACY IN COMPARATIVE EFFECTIVENESS RESEARCH (MET)

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Purpose: This study aims to determine whether propensity regression techniques can improve the accuracy of comparative prediction models.

Method: Many clinical decisions can be enhanced by having accurate predicted risks of important outcomes, particularly when these risks are broken down by treatment. Observational data, however, is complicated

because treatment allocation may be confounded with subject characteristics. Propensity scores have been proposed as a statistical method for addressing such concerns. This study was conducted in a cohort of ~33,000 type 2 diabetic patients previously used to publish a Cox regression model for predicting 6-year risk of overall mortality. This model compared four oral hypoglycemics for which there was a clear treatment bias. The published model was compared with various Cox regression models that included adjustment for or weighting with the propensity score: (1) adjustment for a logistic propensity score (Adjustment Logistic); (2) inverse probability treatment weighting (IPTW) with the logistic propensity score (IPTW Logistic); (3) adjustment for the multinomial propensity scores (Adjustment Multinomial); (4) IPTW with the multinomial propensity scores (IPTW Multinomial). The methods were compared in their ability to accurately predict 6-year mortality as measured by Harrell's C-statistic (using 100 random cross-validations), calibration curves and reclassification tables.

Result: The Adjustment Logistic model offered the best median predicted accuracy and outperformed the other methods in 60 out of the 100 cross-validations. Both versions of IPTW created models that on average were less accurate than the published model without propensity adjustment. The C-statistics associated which each of the models in order from best to worst: Adjustment Logistic (0.754), Adjustment Multinomial (0.753), No Propensity (0.752), IPTW Logistic (0.751), IPTW Multinomial (0.737). The median difference in C-statistic for model Adjustment Logistic versus model No Propensity was 0.001. Similar results were obtained for the other performance measures.

Conclusion: Including a covariate for the probability of receiving treatment offered an incremental improvement in bias corrected predictive accuracy. The benefit was negligible and may not be worth the additional analytic complexity in all circumstances. Interestingly, the use of propensity weighting (IPTW) appeared to harm the prediction accuracy of the published model. These findings question the use of propensity adjustment when the goal is to create a comparative prediction model.

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56. DETERMINING THE MOST INFORMATIVE MAMMOGRAPHIC FEATURES IN BREAST CANCER DIAGNOSIS BY MULTIDIMENSIONAL MUTUAL INFORMATION ANALYSIS AND BAYESIAN REASONING (MET)

Yirong Wu, PhD[1], Oguzhan Alagoz, PhD[1], Mehmet Ayvaci, MS[1], David J. Vanness, Ph.D.[2] and Elizabeth S. Burnside, MD, MPH, MS[1], (1)University of Wisconsin-Madison, Madison, WI, (2)Department of Population Health Sciences, Madison, WI

Purpose: We compare two information theory algorithms for determining the most informative mammographic features to be used in estimation of breast cancer risk.

Method: Our database consists of 9,986 consecutive mammography reports with information on thirty-three features including individual risk factors and mammographic findings, linked to an institutional cancer registry for determination of outcomes (benign or malignant). "Mutual information" quantifies interdependence between random variables using Shannon's entropy measure. "Relevance" is defined as mutual information of features with outcomes, and "redundancy" is defined as mutual information of features with each other. In the multidimensional mutual information (MMI) algorithm, features are ranked by relevance, penalized for redundancy, while single-dimensional mutual information (SMI) algorithm ranks features on relevance only. We investigated the predictive performance of Bayesian networks (BN) trained and tested on sequences of features ranked by each algorithm. The most informative feature set was defined as the smallest feature set having area under the ROC curve not statistically significantly different from the BN trained on the entire set of thirty-three features.

Result: SMI identified mass margin and mass shape as the two most informative features. While MMI analysis concurred that mass margin was the most informative feature, mass shape was determined to be substantially less important because of high redundancy with mass margin. This observation was in concert with clinical findings; a highly suspicious mass has an irregular shape with spiculated margins while a benign mass typically has a round shape with well-circumscribed margins. The size of the most informative feature set was smaller for MMI than for SMI (ten features versus thirteen).

Conclusion: By considering redundancy as well as relevance, MMI outperforms SMI in determining the smallest set of informative individual risk factors and mammographic findings with equivalent performance to the entire feature set. MMI-based rankings may have greater clinical utility to the extent that a smaller set of features allows clinicians to focus attention sequentially on those findings with the highest yield. Furthermore, in other applications where addition of features incurs additional time or monetary cost, MMI may help reduce the cost of diagnostic testing.

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57. WINTDRAWN - A NOVEL JOINT HEALTH-STATE TARIFF-VALUE PREDICTOR BASED ON UNITS OF MORBIDITY (MET)

Mathias Barra, PhD[1], Kim Rand-Hendriksen, Cand.Psychol[2], Liv Ariane Augestad, MD[2] and Knut Stavem, MD, MPH, PhD[2], (1)HØKH, Lørenskog, Norway, (2)Akershus University Hospital, Lørenskog, Norway

Purpose: A recurrent challenge in health-related quality of life (HRQoL) research is how to handle comorbidity, as mean EQ-5D tariff-values (mtv) are usually only known for single health states. Several methods have been proposed to derive joint-state values (jsv) from single-state values (ssv), but comparison of the predicted jsvs with the elicited jsvs from groups of patients who actually have the target comorbidities reveals limited success. The aim of this research is investigating a new jsv predictor (jsp).

Method: We analysed data from the Medical Expenditure Survey Panel (MEPS, $N \approx 3 \cdot 10^4$), revealing a Pearson's R of .9995368 when correlating the number of comorbid disorders (Clinical Classification-Codes) with the mtvs for respondents with the same number of comorbid disorders. We proceeded to construct a novel jsp P based on the idea that the mtv u for a single state population is best viewed as a measure of that single state's number m of *units of morbidity (um)* by a conversion $f(u)=m$ obtained by an initial regression as suggested by the strong correlation above. The predictor aggregates the converted mtvs u and v of two single-states, before predicting the corresponding jsv's value: $P(u,v,z) = f^{-1}(f(u)+f(v)-z)$ Above, z is a parameter intended to account for some overlap between conditions, which for the current research have been set to 1. The resulting predictor is on the form $u+v-c$ where c is a constant depending on f. Though reminiscent of the additive predictor, conceptually it differs in treating the ssv's as proxies for ums rather than as utilities: additivity arise from the linear relation empirically observed and *not* on any *a priori* assumption.

Result: The jsp outperformed various traditional predictors (additive, multiplicative, minimum and a general predictor proposed in [1] w.r.t. the MEPS data set. We next tested the concept on data ($N \approx 10^4$) elicited from a Norwegian inpatient population. Again P outperformed the other.

Conclusion: It is striking that the predictor, conceived by analysing a general population, transfers so readily to the inpatients. Although its construction relies on a linear regression for each data set, it does not rely on distinguishing between morbidities. We recommend adopting P as a canonical candidate predictor, as well as further research into how the parameter z can improve accuracy.

[1]_Bo_Hu_and_Alex_Z._Fu:_*Predicting_Utility_for_Joint_Health_States:_A_General_Framework_and_a_New_Nonparametric_Estimator,_in_*MDM_SEP-OCT_2010

58. MICROSIMULATION AND CALIBRATION METHODS ACCOUNTING FOR OBESITY AND UNDERWEIGHT-RELATED HEALTH IN COUNTRIES LIKE INDIA (MET)

Stephanie L. Bailey, PhD[1], Kunnambath Ramadas, MD[2], Catherine Sauvaget, PhD[3] and Jeremy D. Goldhaber-Fiebert, PhD[1], (1)Stanford University, Stanford, CA, (2)Regional Cancer Centre, Trivandrum, India, (3)International Agency for Research on Cancer, Lyon, France

Purpose: Developing countries like India face a growing prevalence of obesity even as substantial populations of underweight individuals persist. Because both obese and underweight individuals face distinct and elevated health risks, we developed microsimulation and calibration procedures appropriate for considering future obesity and underweight-related health in India.

Methods: We constructed 42 individual-level microsimulation models to represent cohorts of urban and rural men and women in India's states. Each model tracks body mass index (BMI) and BMI changes for individuals over their lifetimes, exposing them to age-, sex-, urban/rural-, state-, and BMI-specific risks of death estimated from life tables and published studies. For projections, individuals begin as adults in 2005-6 based on the 3rd National Family and Health Survey (NFHS) (total n=59,405). Distributions of BMI change rates were estimated from the longitudinal Trivandrum Oral Cancer Study (n=43,055) conditioning on age, sex, and current BMI. We calibrated the BMI change rates for each model based on changes in state-, urban/rural-specific population BMI distributions observed between the 2nd and 3rd NFHS rounds (1998-99 and 2005-6). We compared the performance of Simulated Annealing and Nelder-Mead search algorithms for conducting the calibrations. Outcomes include projections of age- and sex-specific mean BMI, prevalences of underweight (BMI<18.5) and obesity (BMI>27.5) and related mortality patterns.

Results: Both calibration search algorithms achieved good fits for all models, with no model differing from the corresponding NFHS data on state- and urban/rural-specific 5th through 95th percentiles of BMI by more than 2%. Because Nelder-Mead ran approximately 15 times faster than Simulated Annealing, using multiple Nelder-Mead searches to avoid local optima was still faster than using Simulated Annealing. Current 50 year-olds in India have a mean BMI of 22.6, with 9.1% underweight and 21.2% obese. When current 35 year-olds become 50, their mean BMI is projected to be higher (23.2), with a slight increase in underweight individuals (10.1%) and a larger increase in obese individuals (26.8%). Future underweight 50 year-olds account for 23% of deaths.

Conclusions: Given India's increasing obesity prevalence and health risks from being either obese or underweight, microsimulation and calibration methods aid in capturing complex, policy-relevant trends. While obesity is a growing problem, underweight individuals are projected to continue to represent a substantial and disproportionately high share of deaths in India.

59. AGENT-BASED APPROACH TO CONTACT PATTERNS MODELLING (MET)

Marija Zivkovic Gojovic, PhD[1], Beate Sander, RN, MBA, MEcDev[1], Ashleigh Tuite[2] and Natasha Crowcroft, PhD[1], (1)Ontario Agency for Health Protection and Promotion, Toronto, ON, Canada, (2)University of Toronto, Toronto, Ontario, Toronto, ON, Canada

Purpose: The study is designed to develop a computational tool in order to establish and evaluate contact patterns relevant to infectious disease spread and thus to increase the application of agent-based technology in decision making process.

Method: Rapid development of computational capabilities in recent years has lead to the significant increase in the application of agent based modeling technology across various fields, including modeling of infectious disease spread. Defining the agent as an individual and the interactions between agents as social interactions the agent-based approach is often used to create an artificial society as a replica to the real world. This "artificial world" is further used as an experimenting tool to evaluate the wide range of different hypothesis, creating the "virtual laboratory" where experimental hazard is reduced to zero. The use of this tool is especially important when the real experiment can be categorized as costly, impractical or unethical.We developed the computational tool used to create an artificial society of a typical Canadian city and to establish major contact patterns between individuals based entirely on Statistics Canada Census Tract data.

Result: Contact patterns projected by the model showed a high level of similarity to the contact patterns observed in recent empirical studies: strong diagonal assertiveness in the age-based contact matrix which coincides with the age-preferred mixing patterns, existence of sub-diagonals related to children-parent relationships and overall reduction in contact intensity on weekends specifically within the same age groups (main diagonal). Sensitivity analysis of the model parameters additionally pointed that changes in the intensity and duration of contacts can highly influence the structure of the projected contacts patterns.

Conclusion: Comparison of the model outcomes to the empirically collected data showed that it is possible to use the agent based approach in order to create the realistic contact patterns. However, in order to use the agent-based model as an accurate tool in decision-making process, it is important to first determine the plausible ranges of values for sensitive parameters for a specific infectious agent.

Monday, October 24, 2011 (Posters)

SMDM POSTER SESSION 2

7:00 AM - 8:30 AM: Mon. Oct 24, 2011
Grand Ballroom AB (Hyatt Regency Chicago)

Session Summary:

1. A RISK-BENEFIT ANALYSIS OF FACTOR V LEIDEN TESTING TO IMPROVE PREGNANCY OUTCOMES AMONG HIGH-RISK WOMEN

2. A COST-EFFECTIVENESS ANALYSIS OF OFF-LABEL BIOLOGICS TO TREAT SARCOID POSTERIOR UVEITIS VERSUS STANDARD OF CARE: COMPARING INFLIXIMAB TO METHOTREXATE AND SYSTEMIC STEROIDS

3. ESTIMATING MEDICAL EXPENDITURES FOR CHILDHOOD OBESITY COST-EFFECTIVENESS ANALYSES

28. RANDOMIZED TRIAL OF PAIRED AND TRIPLET PROFILE CHOICE TASKS IN THE ELICITATION OF PATIENT PREFERENCES FOR HEARING AIDS WITH CONJOINT ANALYSIS

29. QUESTIONING THE NEUTRALITY OF DECISION AIDS

30. BETWEEN PROD AND PERSUASION: INQUIRY INTO THE NATURE AND JUSTIFICATION OF HEALTH NUDGES

31. PROJECTION BIAS AMONG PERSONS RECEIVING SPINAL INJECTION AS TREATMENT FOR LUMBAR PAIN

32. A BEHAVIOR-DRIVEN MATHEMATICAL MODEL OF MEDICATION COMPLIANCE

33. UNCERTAINTY, GAINS, LOSSES, PROBABILITY… WHAT IS MORE IMPORTANT IN TREATMENT PREFERENCES?

34. ASSESSING THE INFLUENCE OF DELAY DISCOUNTING OF FUTURE HEALTH ON DIET AND PHYSICAL ACTIVITY BEHAVIORS: DOES IT DIFFER BY BODY MASS INDEX CATEGORY?

35. SHOULD PATIENTS WITH RESPIRATORY TRACT INFECTIONS REFRAIN FROM EXERCISE, STAY INDOORS OR STAY IN BED? SURVEY OF GENERAL PRACTITIONERS` JUDGEMENTS IN POLAND AND NORWAY

36. THE IMPACT OF PEER PRESSURE AND RISK PREFERENCE ON SMOKING, DRINKING AND DIETING BEHAVIOR AMONG JAPANESE ADOLESCENT AND COLLEGE STUDENT

37. FACTORS IN INFORMED DECISION MAKING IN HEPATITIS C TESTING

38. END-OF-LIFE DECISIONS IN THE HOSPITAL; WHAT DO PATIENTS PREFER?

39. RISKS AND BENEFITS OF PROSTATE BIOPSY FOLLOWING AN ABNORMAL PSA SCREEN IN GENERAL AND IN A SPECIFIC PATIENT: DECISION ANALYSES

40. APPLYING VERBAL PROTOCOL ANALYSIS TO INVESTIGATE THE DECISION-MAKING STRATEGIES MEN USE WHEN CONSIDERING PROSTATE CANCER RISK FACTORS AND EARLY DETECTION SCREENING BEHAVIOUR: COMPARING MEN WITH AND WITHOUT A FAMILY HISTORY

41. THE COMPLEXITY AND MULTIDIMENSIONALITY OF HEALTH RISK PERCEPTION: DISTORTIONS AND DETERMINANTS OF RISK PERCEPTION FOR VASCULAR AND ONCOLOGICAL HEALTH RISKS AND RISK FACTORS IN GERMANY

42. HPV VACCINATION YES OR NO: A QUESTIONNAIRE STUDY AMONG PARENTS ON DETERMINANTS OF INTENTIONS

43. HOW DO PATIENTS RESOLVE CONFLICTING MEDICATION RELATED INFORMATION?

44. DO PARENTS CONSIDER BENEFITS TO OTHERS WHEN DECIDING WHETHER TO IMMUNIZE THEIR CHILD?

45. DEVELOPMENT OF A TOOL FOR IDENTIFICATION AND CLASSIFICATION OF DECISIONS IN MEDICAL ENCOUNTERS

46. RACIAL/ETHNIC VARIATION IN THE INVOLVEMENT OF PARTNERS IN BREAST CANCER TREATMENT DECISION MAKING

47. USABILITY AND EFFICACY TESTING OF A SPANISH LANGUAGE COLORECTAL CANCER SCREENING DECISION AID IN LATINOS WITH LIMITED ENGLISH PROFICIENCY

48. DEVELOPMENT AND PRELIMINARY EVALUATION OF EMERGENCY MEDICAL ALLIANCE FOR TOTAL COODINATION IN HEALTHCARE (E-MATCH) TO RESOLVE MISMATCH BETWEEN PATIENTS NEEDS AND AVAILABLE RESOURCES

49. HOW COST-EFFECTIVENESS ACCEPTABILITY CURVES VARY WITH THE NUMBER OF TREATMENT STRATEGIES COMPARED AND WHY THIS COMPROMISES THEIR USEFULNESS

50. EXPERT ELICITATION TO POPULATE EARLY HEALTH ECONOMIC MODELS OF MEDICAL DIAGNOSTIC DEVICES IN DEVELOPMENT

51. THE VALUE OF MARKERS IN PREDICTION MODELS: NET BENEFIT AND TEST HARM RATHER THAN THE C-INDEX

52. COMPARISON OF VARIABLE SELECTION METHODS FOR THE GENERATION OF PARSIMONIOUS PREDICTION MODELS FOR USE IN CLINICAL PRACTICE

53. IMPROVING THE EFFICIENCY OF THE ANALYTIC HIERARCHY PROCESS

54. TRANSPLANT CENSORING AND THE NATURAL HISTORY OF MELD VIA EM ESTIMATION

55. USE OF RICHARDSON'S EXTRAPOLATION TO REDUCE TIMING ERRORS IN MARKOV MODELS

56. COMPARATIVE EFFECTIVENESS RESEARCH TO AID DECISION MAKING: RELATING CLINICAL OUTCOMES AND QUALITY ADJUSTED LIFE YEARS

57. ENTROPY-BASED EXPECTED UNCERTAINTY REDUCTION TO GUIDE THE CLINICAL EXAM

Grand Ballroom AB (Hyatt Regency Chicago)

1. A RISK-BENEFIT ANALYSIS OF FACTOR V LEIDEN TESTING TO IMPROVE PREGNANCY OUTCOMES AMONG HIGH-RISK WOMEN (ESP)

Preeti S. Bajaj and David L. Veenstra, PharmD, PhD, University of Washington, Seattle, WA

Purpose: Women who are carriers of the Factor V Leiden mutation are believed to be at greater risk of venous thromboembolism and adverse pregnancy outcomes than non-carriers; however, the potential utility of a genetic test for Factor V Leiden in this setting has not formally been assessed.

Method: We used decision analytic methods to model the potential risks and benefits of testing in a hypothetical cohort of 10,000 pregnant women with a history of recurrent pregnancy loss. In the intervention arm, all women were tested, and we assumed that women testing positive for the Factor V Leiden mutation

would be treated with low molecular weight heparin; those testing negative were assumed to remain untreated. In the comparator arm, none of the women were tested nor did they receive treatment. Outcomes of interest included venous thromboembolism, major bleed due to treatment with low molecular weight heparin, pregnancy loss, and maternal mortality. Outcomes were assessed for the duration of pregnancy and six weeks post-partum, and impacts of mortality were captured over a lifetime. Disutilities were applied for each outcome of interest to inform the change in lifetime QALYs. Data sources included English language literature obtained through PubMed. Scenario and sensitivity analyses were conducted to test robustness of findings with respect to key parameters and assess various clinical scenarios.

Result: The use of Factor V Leiden testing to guide use of low molecular weight heparin resulted in a reduction of 10 venous thromboembolic events and 367 pregnancy losses, and an increase of 24 major bleeding events per 10,000 women tested. On a per-patient tested basis, testing resulted in 0.002 QALYs gained over the one-year timeframe, and 0.0609 QALYs gained in the lifetime analysis.

Conclusion: These findings suggest use of the Factor V Leiden test in this population may offer important tradeoffs between clinical and personal utility. Further analysis is required to more thoroughly account for the impacts of pregnancy loss on the woman and fetus and to assess the impact on other pregnancy-related outcomes.

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2. A COST-EFFECTIVENESS ANALYSIS OF OFF-LABEL BIOLOGICS TO TREAT SARCOID POSTERIOR UVEITIS VERSUS STANDARD OF CARE: COMPARING INFLIXIMAB TO METHOTREXATE AND SYSTEMIC STEROIDS (ESP)

William V. Padula, MS, University of Colorado, Aurora, CO, Taygan Yilmaz, MPH, Dartmouth College, Lebanon, NH and Miguel Cordero-Coma, M.D., Hospital de Leon, Leon, Spain

Purpose: To evaluate whether infliximab, a modern off-label biologic, is cost-effective for treating sarcoid posterior uveitis compared to methotrexate and systemtic steroids. Sarcoid posterior uveitis is a progressive eye disease that can lead to blindness if untreated. In recent trials, ophthalmologists have utilized infliximab, a humanized anti-tumor necrosis factor alpha antibody, which can reverse the effects of uveitis. Systemtic steroids and methotrexate are indicated as two current standards of care for sarcoid posterior uveitis.

Method: A semi-Markov model followed patients' therapy from the onset of sarcoid posterior uveitis using the societal perspective. The lifetime model simulated health states that could lead to successful reversal of uveitis with standard or intensified treatment with systemic steroids, methotrexate, or infliximab. The model included treatment success, death, or side effects (e.g. glaucoma, cataracts, and nausea) after one year of patient follow-up. Probabilities, health utilities, and costs were included in the model based on findings from literature. Costs and effects were discounted at 3% ($US; 2010 values). We conducted univariate sensitivity analyses and threshold analyses for variables with the greatest impact on the model results. A Bayesian multivariate probablistic sensitivity analysis using 10,000 Monte Carlo simulations was also conducted.

Results were interpretted from a predetermined willingness-to-pay of $50,000/QALY. Result: In order of cost, base case results showed systemic steroids most affordable ($26,871; 14.58 QALYs), followed by methotrexate ($40,351; 15.92 QALYs), and then infliximab ($46,547; 15.04 QALYs). Methotrexate was cost-effective compared to steroids, with an incremental cost-effectiveness ratio of $10,053/QALY. Methotrexate dominated infliximab. Univariate sensitivity analyses suggested that the model was sensitive to the utility of a patient's successful recovery from uveitis (0.84 QALYs). If patients' health utility after successful recovery is below 0.750, then infliximab has a greater net benefit than methotrexate. The multivariate probabilistic sensitivity analysis showed that methotrexate dominated infliximab in 60% of the simulations. Methotrexate was not cost-effective over steroids in 4% of simulations.

Conclusion: This cost-effectiveness analysis suggests that despite major advances in the use of biologics for treating sight-threatening sarcoid posterior uveitis, methotrexate remains a less expensive and more cost-effective strategy. Methotrexate should be adopted as the standard of care for treatment considering its incremental cost-effectiveness at a reasonable willingness-to-pay. Other therapeutic options, such as infliximab, may be considered for certain cases.

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3. ESTIMATING MEDICAL EXPENDITURES FOR CHILDHOOD OBESITY COST-EFFECTIVENESS ANALYSES (ESP)

Davene R. Wright, Harvard University, Boston, MA and Lisa Prosser, PhD, University of Michigan, Ann Arbor, MI

Purpose: To ascertain whether overweight and obesity are significant predictors of medical expenditures during childhood and adolescence.

Method: We analyzed medical expenditures of individuals aged 6-17 in the 2006-2008 Medical Expenditure Panel Survey, a nationally representative cross-sectional survey of annual medical expenditures in the US. Medical expenditures from public insurance programs were adjusted to private insurance reimbursement rates using the American Academy of Pediatrics Pediatric Medical Cost Model (PMCM). Individuals were assigned to categories of weight based on CDC age- and sex-adjusted Body Mass Index (BMI) cutoffs. The impact of overweight and obesity on annual medical expenditures was assessed, controlling for age (adolescent or not), the interaction between age and weight category, sex, race, geographic region, and insurance status. An algorithm by Manning and Mullahy was used to select the appropriate medical expenditure estimation model for the analysis. A two-part model, where part one was a probit regression of incurring positive expenditures and part two was an ordinary least squared regression on logged expenditures, was selected. A Duan smearing factor was used to transform logged expenditures back to the original dollar scale. Medical expenditures were assessed in 2010 US dollars.

Result: Child obesity was a significant predictor of having positive medical expenditures in part one of the model (OR = 0.91, p < 0.05). Among those with positive expenditures, neither child overweight nor child obesity were significant predictors of higher expenditures in part two of the model. Adolescent obesity was a significant predictor of having positive medical expenditures in part one of the model (OR = 1.26, p < 0.001). Among those with positive expenditures, adolescent obesity was a significant predictor of higher expenditures (p < 0.10) in part two of the model. Race, insurance status, income, and age were also significant predictors of higher medical expenditures in part two of the model.

Conclusion: Because obesity was a significant predictor of medical expenditures, costs associated with weight category warrant inclusion in model-based cost-effectiveness analyses of child and adolescent obesity interventions.

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4. DOES TREATMENT OF ASYMPTOMATIC HYPERURICEMIA IMPROVE HEALTH OUTCOMES? A DECISION- ANALYTIC EVALUATION (ESP)

Roopa Akkineni[1], Alexandra Lee[2], Katherine L. Miller[3], Anna N.A. Tosteson, ScD[4], Hyon K. Choi[5], Yanyan Zhu[5] and Daniel Albert[1], (1)Dartmouth Hitchcock Medical Center, Lebanon, NH, (2)Veterans Affairs, White River Junction, VT, (3)Northeastern Ohio Universities College of Medicine, Rootstown, OH, (4)The Dartmouth Institute for Health Policy & Clinical Practice, Lebanon, NH, (5)Boston University, Boston, MA

Purpose: Recent studies suggest that elevated serum uric acid is associated with increased risk for coronary and cerebrovascular disease. Treatment with urate lowering drugs like Allopurinol may reduce cardiovascular events. The purpose of this study was to examine quality-of-life benefits and risks of treating asymptomatic hyperuricemia with Allopurinol.

Method: A Markov state-transition model was constructed to assess the occurrence of cardiovascular and neurovascular events and to estimate life expectancy in patients undergoing urate-lowering treatment with Allopurinol.   The model simulated three hypothetical cohorts of male patients 50-years and older having asymptomatic hyperuricemia, each with different serum urate concentrations (4-5.9mg/dl, 6-6.9mg/dl and 7-7.9mg/dl). Age-specific incidences of gout, cardio- and neurovascular events were modeled across different serum urate concentrations. Sensitivity analyses were conducted for probability of adverse drug reactions, incidence of gout, incidence and death from a vascular event. Probabilities and quality adjustment values were obtained from published literature. Life expectancy was derived from Centers for Disease Control and Prevention Life Tables 2005. The outcome measure was quality-adjusted life expectancy (QALE).

Result:

	Serum Urate (mg/dl)		
Decision	**4 - 5.9 mg/dl**	**6 - 6.9 mg/dl**	**7 - 7.9mg/dl**
Treat (QALYS)	31.837	**31.190**	**30.749**
Don't Treat (QALYS)	**32.152**	31.162	30.201

   A serum urate level > 7mg/dl favored treatment and yielded the maximum gain in QALYs compared to watchful waiting at 0.55 QALYs or 6.6 months.   Sensitivity analysis showed treatment with Allopurinol was well tolerated at drug reaction rates up to 27% (6-6.9mg/dl) and 84% (7-7.9mg/dl). Treatment strategy was most effective in preventing incidence and death from vascular events at higher serum urate.

Conclusion: Allopurinol treatment was more effective than watchful waiting for patients with asymptomatic hyperuricemia at serum urate concentrations above 6mg/dl based on QALE. Treatment proved to be protective against long-term cardiovascular and neurovascular events, generating a maximum gain in QALY of 6.6 months. A clinical trial that evaluates long-term effectiveness of treating asymptomatic hyperuricemia with urate lowering therapies in preventing cardio and neurovascular events would prove useful in validating these results.

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5. TO BE SCREENED OR NOT TO BE SCREENED? THE CONSEQUENCES OF PROSTATE-SPECIFIC ANTIGEN SCREENING FOR THE INDIVIDUAL (ESP)

E.M. Wever, MSc, G. Draisma, PhD, E.A.M. Heijnsdijk, PhD and H. J. de Koning, PhD, MD, Erasmus Medical Center, Rotterdam, Netherlands

Purpose: To present for an individual the estimated benefits and adverse effects associated with the decision to participate in screening.

Method: We used a validated micro-simulation model to simulate the development of prostate cancer and screening for a cohort in which individuals were screened for the first time between the ages of 50 and 70.

These individuals were screened until the age of 65, 70 or 75. We analyzed the situation in which there was no screening, screening every year and screening every four years. Survival curves, including prostate-cancer-free survival, were calculated with follow-up time from the time of decision to be screened. For men who had been screened and those who had not, we estimated the lifetime probability of prostate cancer diagnosis and death, and overall and prostate-cancer-free life-expectancy. Using these values we calculated the utility break-even point. This is that value of the utility of living with diagnosed prostate cancer for which the utility-adjusted life-expectancy does not change upon deciding to participate in screening or not.

Result: The effects of participating in screening were estimated to be on average a limited gain in life-expectancy of 0.08 years versus a more substantial loss of 1.53 prostate-cancer-free life-years. The utility break-even point was on average 0.952. This result imply that men who judge that their quality of life will decrease by no more than 4.8% in the event that they are diagnosed and treated for prostate cancer could consider to be screened. From the protocols we analyzed, screening every four years till age 65 had the lowest utility break-even point. Men could consider screening under this protocol if they judge their quality of life to decrease by no more than 7.7% in the event that they are diagnosed and treated for prostate cancer.

Conclusion: Individuals who decide to be screened might benefit from screening, but the associated potential adverse effects are significant. The decision to be screened should depend on how undesirable it is for the individual to live with diagnosed prostate cancer and the potential side-effects of treatment.

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6. ULNAR NEUROPATHY AT THE ELBOW: A COST-UTILITY ANALYSIS (ESP)

Jae W. Song, M.D., M.S., *Kevin C. Chung, M.D., M.S. and Lisa A. Prosser, M.S., Ph.D., University of Michigan, Ann Arbor, MI*

Purpose: Ulnar neuropathy at the elbow (UNE) is the second most common compressive neuropathy of the upper extremity, but the most optimal treatment for this disease is uncertain. We performed a cost-utility analysis for four different surgical treatments for UNE.

Methods: A cost-utility analysis was performed from the societal perspective. A decision analytic model was designed comparing 4 surgical treatment strategies: (a) simple decompression followed by a salvage surgery (anterior submuscular transposition) for a bad outcome; (b) anterior subcutaneous transposition followed by a salvage surgery for a bad outcome; (c) medial epicondylectomy followed by a salvage surgery for a bad outcome; and (d) anterior submuscular transposition. A bad outcome after anterior submuscular transposition as the initial surgery was considered an end-point in the model. Preferences for temporary health states for UNE, the surgeries, and surgical complications were elicited through a time trade-off survey administered to a convenience sample of 102 caregivers accompanying patients to physician visits. Probabilities of clinical outcomes and complications were derived from a Cochrane Collaboration meta-analysis and a systematic MEDLINE and EMBASE search of the medical literature. Costs (2009 U.S. dollars) were derived from Medicare reimbursement rates. The model estimated quality-adjusted life-years (QALYs) and costs for a 3-year time horizon. A 3% annual discount rate was applied to costs and QALYs. Incremental cost-effectiveness ratios (ICERs) were calculated. Sensitivity analyses were performed to evaluate the effect of uncertainty for input parameters on model results.

Results: In the reference-case analysis, simple decompression as an initial procedure was the most effective treatment strategy (Table 1). Multi-way sensitivity analyses varying the preferences for the surgeries supported the robustness of the results. A model structure sensitivity analysis was also performed with a surgical re-exploration following a bad outcome for an initial anterior submuscular transposition. Under all evaluated scenarios, simple decompression yielded cost-effectiveness ratios less than $2,031/QALY.

Conclusions: These results suggest simple decompression surgery as an initial treatment option is the preferred option for treating UNE and is cost-effective according to commonly-used cost-effectiveness thresholds. However, further studies are needed to better understand whether the marginal differences in effectiveness are clinically significant.

Table 1: Reference Case Analysis Results

Surgical Strategy	Cost	Incremental Cost	QALYs	Incremental QALYs	Incremental Cost Effectiveness Ratio
Anterior Submuscular Transposition	$2,029		2.58		
Anterior Subcutaneous Transposition	$2,181	$152	2.72	0.14	1,110 $/QALYs
Simple Decompression	$2,260	$80	2.76	0.04	2,031 $/QALYs
Medial Epicondylectomy	$3,439	$1,178	2.64	-0.11	(Dominated)

7. COST-EFFECTIVENESS ANALYSIS OF IMPLEMENTING A SCREENING PROGRAM FOR HEPATITIS C INFECTION AMONG EGYPTIAN IMMIGRANTS IN THE UNITED STATES (ESP)

David D. Kim, B.S.E., Amr S. Soliman, M.D., Ph.D. and David W. Hutton, Ph.D., University of Michigan School of Public Health, Ann Arbor, MI

Purpose: Because Egyptians have high prevalence of hepatitis C virus (HCV) infection, we estimated the cost-effectiveness of screening for HCV infection among Egyptian immigrants in the United States.

Method: We developed a Markov decision analysis model of the natural history of HCV infection and treatment to evaluate the cost-effectiveness of screening Egyptian immigrants in the United States. We used hepatitis C age-specific progression rates and prevalence for Egyptian people while costs are in US dollars and health utilities from Americans have been used with 3% annual discount rates. All data were collected from the literature. We used a societal perspective, measuring costs, quality-adjusted life years (QALYs) gained, and calculated the incremental cost-effectiveness ratio of a hypothetical program of screening and treating Egyptian immigrants for HCV versus no screening. Sensitivity analysis was conducted to test uncertainty in the model assumptions.

Result: Under base case assumptions, a screening program for individuals older than 40 would cost $18,895 for 16.74 QALYs, while non-screening would cost $13,637 for 16.70 QALYs for the 40 year time horizon. The incremental cost-effectiveness ratio (ICER) for implementing a screening program for Egyptian immigrants who are older than 40 years old in the United States compared to no screening is $159,230/QALY. Results were the most sensitive to the utility of chronic hepatitis C infection. When the utility of HCV infection is lower than 0.921, the ICER would be lower than $100,000/QALY.

Conclusion: Implementing a hepatitis C screening program for Egyptian immigrants is relatively expensive according to a variety of commonly-cited thresholds. Except for a reduction in the utility of hepatitis C below 0.921, the analysis is robust to varying other underlying assumptions. Further research expanding this analysis to other immigrant populations with high HCV prevalence are needed.

8. USE OF HIGH-SENSITIVE TROPONIN T ASSAY FOR THE EARLY DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION IN CHEST PAIN PATIENTS: AN ECONOMIC EVALUATION (ESP)

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Purpose: The aim of this study was to assess the cost effectiveness of a high-sensitive Troponin T assay (hsTnT), alone or combined with the heart-type fatty acid-binding protein (H-FABP) assay in comparison with the conventional cardiac Troponin (cTnT) assay for the diagnosis of AMI in patients presenting to the hospital with chest pain.

Method: A cost-utility analysis (Quality Adjusted Life Years-QALYs) and a cost effectiveness analysis (Life Years Gained-LYGs and AMI-deaths averted) were performed based on a decision analytic model, using a health care perspective and a life time time-horizon. One way and probabilistic sensitivity analyses were done to test the robustness of model predictions.

Result: For a life time incremental cost of 111 Euros, use of hsTnT over conventional cTnT results in gain of a QALY for 3748 Euros for AMI survivor. Use of hsTnT also saves 16-17 additional lives per 1000 AMI patients. Combination of hsTnT and H-FABP over cTnT incurs an incremental cost of 178 Euros and cost of a QALY comes to 5717 Euros. Probabilistic sensitivity analysis shows that hsTnT strategy wass dominant over combination of hsTnT with H-FABP in base case analysis and in more than 97% probabilistic draws. Cost effectiveness acceptability curves were drawn for all three diagnostic strategies to determine the probability of cost effectiveness at various cost limits that society is willing to pay to gain one QALY. The hsTnT assay was found to be cost effective in more than 90% of simulations at a ceiling ratio of 4800 Euros, being much lower than the traditionally acceptable limit of 20,000 Euros per QALY. Combination strategy remained dominated by hsTnT at all tested values of the ceiling ratio.

Incremental Cost Effectiveness Ratio(s) ICERs		
	Incremental cost per LYG	**Incremental cost per QALY**
cTnT	Reference strategy	Reference strategy
hsTnT vs cTnT	€ 2717	€ 3748
hsTnT + H-FABP vs cTnT	€ 4145	€ 5717
hsTnT + H-FABP vs hsTnT	€ 30640	€ 42262

Conclusion: Our analysis suggests that hsTnT assay is a very cost effective diagnostic tool relative to conventional TnT assay. Combination of hsTnT and H-FABP does not offer any additional economic and health benefit over hsTnT test alone.

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9. UNIVERSAL NEWBORN SCREENING FOR SEVERE COMBINED IMMUNODEFICIENCY: A COST EFFECTIVENESS ANALYSIS (ESP)

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Purpose: Studies have demonstrated that earlier detection of infants with Severe Combined Immunodeficiency (SCID) improves survival and many have suggested that universal neonatal screening for SCID would significantly improve outcomes for those children affected. This study investigates the cost-effectiveness of universal screening, taking into account the costs and benefits associated with early detection of SCID.

Methods: A decision analytic model was built using TreeAge software that compared universal newborn screening vs. no screening for SCID. All costs and benefits were derived from available literature. Utilities ranging from 0 (death) to 1 (perfect health) were applied to discounted life expectancy at a rate of 3% to generate QALYs. Baseline values for the newborn screening test included sensitivity of 0.84, specificity of 0.97 and a cost of $5.50. The cost-effectiveness threshold was set to $100,000 per QALY. Base-case and one-way sensitivity analysis of model parameters were performed.

Results: Universal screening as compared to no screening for SCID is more expensive, more effective, and cost effective at $87,081 per QALY (Table 1). For the screening test, at a specificity less than 0.96, it's no longer cost effective, however, sensitivity must be greater than 0.73 for universal screening to be cost effective. The model was quite sensitive to the cost of screening; at a cost of $8.50 per test universal was no longer cost effective.

Conclusions: At baseline, universal screening for SCID is marginally cost effective under our assumptions. The body of literature in this area suggests significant improvement in outcomes in those children with SCID who are identified at birth with a 50.4% reduction in overall mortality. The costs of screening and diagnosis of SCID need additional investigation to clarify whether this cost-effectiveness ratio can be further reduced.

Table 1. Outcomes of Universal Newborn Screening for SCID			
	Universal Screening	No Screening	Differences
Per 4 million live births			
Costs	$81,129,000	$6,320,000	$74,809,000
QALYs	107,097,232	107,096,376	856
ICER			$87,081/ QALY

10. CAROTID ENDARTERECTOMY VERSUS STENTING: A DECISION ANALYSIS (ESP)

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Purpose: More than 150,000 patients undergo carotid endarterectomy (CEA) or carotid artery stenting (CAS) annually for the prevention of ischemic stroke in the United States alone. The benefit of CEA relative to CAS in stroke prevention is limited by the elevated risk of myocardial infarction following CEA. In light of this consideration, a decision analysis model was used to evaluate expected outcomes from these two treatment strategies.

Method: Data from meta-analyses and systematic reviews of the literature were used to define event rates of stroke, myocardial infarction and death. The periprocedural period decision analytic model was stratified for age, gender and symptom status. Sensitivity analysis was performed to evaluate the influence of ranges of reported event rates on the relative efficacy of the two treatment strategies. Quality-adjusted life years was used as a measure of efficacy.

Result: Over the course of a 4-year study period CEA was the preferred treatment strategy resulting in a quality-adjusted life expectancy gain of 22 days. Sensitivity analyses demonstrated CEA as the preferred strategy when periprocedural rates of stroke associated with CAS and CEA were greater 2.7% and less than 6.0%, respectively. Subgroup analysis revealed the short-term periprocedural benefit of CEA relative to CAS to be most pronounced in patients who are greater than 70 years of age (15 days). The advantage of CEA was marginal among male, female and symptomatic patients (7, 4, and 4 days, respectively) while no treatment strategy was dominant among asymptomatic patients and those under 70 years of age.

Conclusion: In a decision analysis model of the treatment of carotid stenosis CEA was the preferred intervention particularly among patients greater than 70 years of age. The benefit of CEA is dependent on periprocedural rates of stroke being below 6.0%. In centers achieving CAS periprocedural stroke rates less than 2.7%, CAS should be performed.

11. CREATING A VOCABULARY FRAMEWORK FOR PTSD: TOWARD A BETTER UNDERSTANDING OF SYMPTOMATOLOGY, TREATMENT, RESILIENCY, AND SUICIDALITY (ESP)

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Purpose: For patients with psychiatric disorders, clinician notes are the principal source of information about the course and severity of their illness. A vocabulary framework is a structured representation of single words and short phrases used clinically when documenting patient encounters. Such a framework is an essential first step to developing automated tools for extracting clinical information from electronic medical records. We developed a framework that defines the vocabulary used by clinicians who provide clinical care to

patients suffering from post traumatic stress disorder (PTSD). The purpose of this study was to learn what data sources are needed to create a comprehensive vocabulary framework.

Methods: A set of complementary data sources were used to construct a framework and classify terminology about the following clinical domains: change in symptoms, prescribed treatments, terms related to resiliency, and terms related to suicidality. Data from the following data sources were included: terms derived from published PTSD treatment guidelines, focus groups with mental health clinicians from five VA medical centers, automated text mining of 100 progress notes, manual annotation of terms from approximately 1,000 outpatient progress notes, and terms derived from SNOMED-CT.

Results: A total of 158 terms were derived from the PTSD treatment guidelines, 172 terms resulted from SNOMED-CT, 43 were identified in the focus groups, and another 20 resulted from text mining. However, 985 unique terms were identified from annotation of the progress notes. Of the unique terms, 397 terms were included in 4 symptom categories (re-experiencing, avoidance, arousal, and general) and 219 terms were included in 3 treatment categories (counseling, pharmacotherapy, and general).

Conclusions: Systematic annotation of outpatient progress notes was a rich source of clinical terms. The range of terms used by individual clinicians is broad, with multiple synonyms occurring in nearly all categories of symptoms and treatments. Existing structured vocabularies do not capture most terminology used by clinicians for care of patients with PTSD. In this clinical domain, development of a vocabulary framework from actual clinical text has great promise. Future studies will focus on incorporating this vocabulary into a PTSD term identification tool that can be used in chart abstraction, text mining, and clinical decision support development.

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12. TWO-YEAR DIRECT AND INDIRECT COSTS FOR PATIENTS WITH INFLAMMATORY RHEUMATIC JOINT DISEASES: DATA FROM REAL LIFE FOLLOW-UP OF PATIENTS IN THE NOR-DMARD REGISTRY (ESP)

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Purpose: The overall aim of this study was to estimate total costs for patients with rheumatoid arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA) in a cohort of patients treated with disease-modifying antirheumatic drugs (DMARDs). Specific aims were to compare costs across diagnoses and over time.

Method: The main data source was the Norwegian DMARD register (NOR-DMARD) that captures outcomes and resource use among patients starting therapy with synthetic and biologic DMARDs. Costs were estimated for four six-month periods from the start of a DMARD regimen. We included RA (n=1 664), AS (n=245) and PsA (n=491) patients with available 2-year data. Direct costs included pharmaceuticals, imaging examinations, stays in hospitals and rehabilitation units and visits to general practitioners, private rheumatologists, physiotherapists and outpatient clinics. Indirect cost included patients' workforce participation. Differences in costs across diagnoses were tested by Kruskal-Wallis equality-of-populations rank test and changes in costs between first and fourth six-month period were tested by paired *t*-tests.

Result: Total two-year costs were similar across diagnoses for patients on synthetic DMARD treatment (RA/AS/PsA $98 000/90 400/98 500) and on biologic DMARD treatment ($178 000/168 200/159 500). The largest cost component was productivity loss. Total costs decreased significantly from the first to the fourth 6-month period for all diagnoses, and this decrease was influenced by reductions both in direct and indirect

costs. **Mean total costs in US Dollar according to time period and diagnosis for patients treated with biologic DMARDs.**

| Diagnosis | Type of DMARD | Type of cost | Time period | | | *p-value and 95% CI for the change in cost between 1st and last 6-month period** |
			0-6 months	6-12 months	12-24 months divided by 2	
RA	Biologic n=489	Total	47 556	44 454	42 994	*p*<0.001 CI [2 964;3 974]
PsA	Biologic n=124	Total	44 869	38 459	38 110	*p*<0.001 CI [3 198;9 691]
AS	Biologic n=190	Total	46 320	41 613	40 111	*p*<0.001 CI [3 346;8 718]

Paired T-test of no difference in costs between 1st and last 6-months period

Conclusion: Total costs were similar across the main inflammatory rheumatic diseases. Biologic DMARD treatment entails considerable drug cost but the total costs decline during the first two years on treatment in both RA, AS and PsA.

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13. COST-EFFECTIVENESS OF MANUAL THERAPY, EXERCISE, AND MANUAL THERAPY AND EXERCISE COMBINED FOR THE MANAGEMENT OF OSTEOARTHRITIS OF THE HIP AND/OR KNEE (ESP)

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Purpose: To assess the cost-effectiveness of manual therapy, exercise, and manual therapy and exercise combined versus usual care in patients with hip and/or knee osteoarthritis (OA).

Method: A cost-utility analysis from the health care perspective was performed alongside the Management of Osteoarthritis (MOA) Trial (n=206). Each participant in a treatment group was scheduled for 9 individually supervised physical therapy treatments. The manual therapy group focused on increasing mobility through manually implemented forces at the joint and surrounding structures. The exercise group focused on increasing strength and mobility, and manual therapy and exercise group was a combination of both treatments. All interventions were in addition to usual care. The main outcome measures of the cost-utility analysis were total health care cost (unit costs estimated from a combination of published and unpublished sources, presented in 2008 USD) and quality adjusted life years (QALY) at 12 months; QALYs were estimated from the SF-12. Multivariate analyses were performed using generalized linear models with a power 2.0 link and Poisson family. Incremental cost effectiveness ratios (ICER) and 95% CIs and cost-effectiveness acceptability curves (CEAC) were reported. Mean differences between groups and 95% CIs were obtained by bootstrap regressions (2000 replications). A willingness to pay (WTP) threshold of $50,000 was used to judge good value for money. CEACs were calculated for WTP thresholds of up to $100,000 per QALY.

Result: The addition of individually supervised physical therapy to usual care resulted in an increase in QALYs and higher costs for all treatment groups at 12 months. Health care costs were $166.54 higher than usual care in the manual therapy treatment and the ICER was $41,761 (9113.05, -14800.20). For the exercise group, total costs were $341.35 higher than usual care and the ICER was $42,276.12 (9250.48, -15072). The combined therapy treatment group also resulted in higher costs when compared with usual care ($522.98) and an ICER estimate of $42,643.21 (9359.20, -15302.80). For all groups, at a WTP of $100,000, probabilities of cost-effectiveness reached 63%.

Conclusion: The cost-effectiveness estimates for each treatment group fell below the $50,000 threshold, indicating good value, however a large degree of uncertainty surrounds these estimates.

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14. BLACK RACE IS ASSOCIATED WITH PREFERENTIAL USE OF HOSPICE AT HOME VERSUS AT A SKILLED NURSING FACILITY (ESP)

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Purpose: Hospice, which provides end of life care for more than 1/3 of Americans, can occur at home, a skilled nursing facility (SNF), or a dedicated hospice facility. SNF-based hospice is thought to be the most expensive for patients as the Medicare benefit only covers the hospice care, not the SNF room and board. Using a large, nationally representative database, we compared the selection of hospice venue by blacks and whites and examined whether blacks favor the less expensive hospice options.

Method: Using the 2007 the National Home and Hospice Care Survey (NHHCS), which surveyed 4705 patients discharged from hospice across the US, we developed a multinomial logistic regression evaluating the odds of a patient selecting hospice at home versus a dedicated facility and the odds of hospice at home versus a skilled nursing facility. Race (black or white) was an independent variable in all regressions. Covariates for the adjusted regression were selected based on clinical relevance to hospice venue selection. In the NHHCS, blacks were older and less likely to have cancer. They also had shorter enrollment periods in hospice and different distributions of hospice settings and primary insurance providers.

Result: Blacks (255 discharges), compared with whites (3514 discharges), were more likely to select home hospice, compared with SNF-based hospice in the unadjusted regressions (marginal effect = -0.12, p < 0.001.) Following adjustment for demographic and clinical characteristics, black race remained a negative predictor of SNF-based hospice selected (marginal effect = -0.025, p = 0.034), though the effect was attenuated. Other factors were also identified as predictors of home or SNF-based hospice use: self pay and length of stay <7 days were both negative predictors of the SNF venue (marginal effect = 0.022, p = 0.018 and marginal effect -0.038, p< 0.001, respectively), while living alone was a positive predictor (marginal effect 0.032, p = 0.002). Blacks and whites used home and dedicated inpatient hospice services equally in both the unadjusted and adjusted regressions.

Conclusion: Black hospice patients are more likely to receive hospice services at home, rather than at the more expensive venue of a skilled nursing facility, than white hospice patients.

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15. MORE INTENSIVE COLORECTAL CANCER SCREENING FOR OBESE SMOKERS: THE IMPACT OF LIFE EXPECTANCY (ESP)

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Purpose: To determine whether obese current smokers should be screened more intensively for colorectal cancer (CRC) than the general population given their increased risk for CRC and other cause mortality. Offering more intensive screening of CRC to high risk individuals based on risk factors such as a high body mass index (BMI) and smoking, may be beneficiary. However, the presence of such risk factors may also limit the benefits of intensifying CRC screening, because the same risk factors also affect the risk for other important diseases such as lung cancer and cardiovascular disease.

Method: We used the MISCAN-Colon micro-simulation model to estimate costs and effects of colonoscopy screening in obese current smokers and in the general population for screening schedules with different screening ages, number of screens in a life time and screening intervals. From these model outcomes, we determined the optimal CRC screening schedule from a cost-effectiveness perspective for obese current smokers and for the general population. For the obese smokers we conducted this analysis with two alternative life tables: 1) with the average US life table; 2) risk factor specific life table. This latter table has been derived from National Health and Examination Survey (NHANES) and NHNANES linked- mortality.

Result: When accounting for survival that is specific for obese smokers, obese smokers and the general population should be offered the same amount of screening: 4 screenings, starting at 50 with an interval of 8 years. If obese current smokers would not be at increased risk for other cause mortality, they should be offered considerably more screening: 6 screenings at a 6-year interval starting at 50.

Conclusion: From a cost-effectiveness point of view the impact of risk factors on other cause mortality should not be ignored when individualizing screening decisions based on risk factors, because this will result in overestimation of benefits and therefore in too intensive screening recommendations in e.g. obese current smokers.

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16. ANALYZING CLAIMS DATA FOR HEALTH SERVICES USE IN CHILDREN AND ADOLESCENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ESP)

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Purpose: The aim of this study was to analyze pseudonymized Austrian public health insurance claims data of two years (2006-2007) in order to investigate the utilization of health services in children and adolescents with attention deficit hyperactivity disorder (ADHD).

Method: The data on drug prescription, stationary visits, extramural health services and individual information on patients like age, gender and residential district are stored in a relational database. As the data sets are linked to pseudonymized persons by their IDs, we were able to identify patients with certain

interesting characteristics. We generally restricted evaluations to persons who were alive and under 20 years old on January 1, 2007 and analyzed the medical services that this subpopulation consumed in a second step.

In Austria only data on stationary visits contains ICD-10 coded information on diagnosis (for ADHD: F90 and F98.8). For identification of ADHD patients without stationary visits we used the results of a project that mapped drugs classified by their ATC code to corresponding diagnosis and found a correlation between ADHD and the ATC group N06B ("Psychostimulants, agents used for ADHD and Nootropics"), which clearly makes sense.

Result: The basic population consisted of 1 885 037 persons corresponding to persons under 20 years who are covered by Austrian public health insurance. From this population 5 707 patients filled a total of 62 850 prescriptions for a N06B drug during the two years period, with a clear concentration in the middle age group of the nine- to twelve-year-olds. The number of total prescriptions per quarter of year is nearly linearly increasing with the exception of the third quarter of each year, where there are far less prescriptions, possibly due to the summer holidays in Austria. On the other hand 1517 patients – of whom 802 had also filled prescriptions for a N06B drug – had 3901 stationary visits with ADHD diagnosis.

Conclusion: The linking of the data to persons makes it possible to filter patients for certain criteria (like the prescription of a drug indicating a disease, as in the case of ADHD) and analyze the rest of their medical claims. Future modeling studies will use this type of longitudinal data to map dynamic and seasonal relationships including treatment pathways.

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17. BLEEDING RISK AND ANTICOAGULATION DURATION AFTER UNPROVOKED VENOUS THROMBOEMBOLISM: A DECISION ANALYSIS (ESP)

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Purpose: Anticoagulation guidelines suggest anticoagulation (AC) duration after unprovoked venous thromboembolism (VTE) should be determined by an individual risk assessment, balancing bleeding and VTE recurrence risks. Few models consider these risks objectively. The RIETE database (Ruiz-Gimenez, *Thromb Haemost* 2008;100:26-31) incorporates six risk factors for anticoagulation bleeding into a model that categorizes bleeding with AC into low-, medium-, or high-risk categories.

Methods: We constructed a Markov model to compare lifetime anticoagulation vs. shorter durations in patients with unprovoked VTE. Risks of major, minor, and fatal bleeding with and without AC, VTE risk, morbidity, mortality, and quality of life utilities were obtained from the literature. We used decision analysis techniques to assess the influence of RIETE variables, including 1) age >75 years, 2) cancer, 3) creatinine >1.2, and 4) major bleeding on AC duration.

Results: In a two-way sensitivity analysis, we compared the effects of varying bleeding and VTE risk, for four specific RIETE bleeding risk factors (Figure). Despite the increased risk of bleeding associated with age, cancer, anemia, renal disease, and major bleed, incorporating these variables did not necessarily have the expected effect on AC strategy. All scenarios were close to the line of indifference between AC strategies. Cancer was in the range where long-term AC is not favored, in contrast to current guidelines *(CHEST 2008)*. Conversely, major bleeding and renal failure fell where long-term AC is not favored, in line with clinical practice.
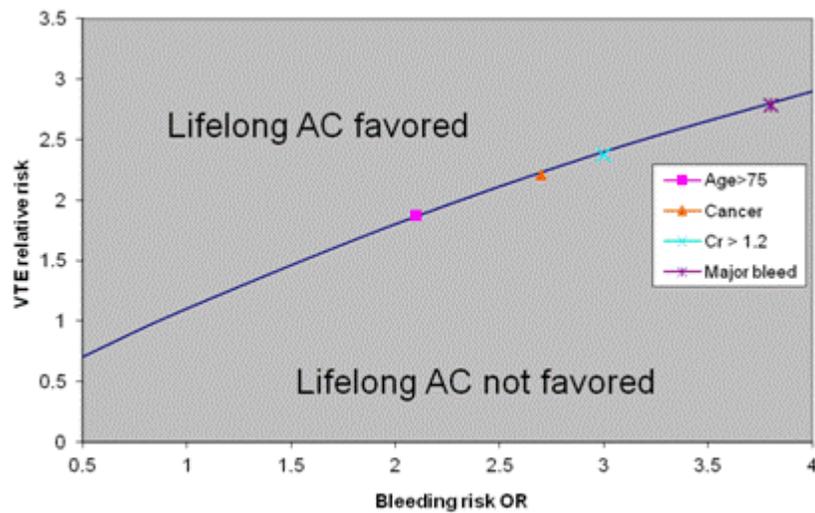
Conclusion: While cancer, renal disease, age, and major bleeding contribute to bleeding risk on AC, these risks alone may not predict optimal AC duration when associated VTE risks are also considered. Since all factors fell close to the line of indifference between strategies, it appears that better methods to assess and calculate individual patient risk are needed to optimize patient-specific AC decisions.

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18. RISK ANALYSIS AND DECISION MAKING IN NEUROSURGERY: BRAIN MAPPING STRUCTURAL INVARIANT OF COGNITIVE FUNCTIONS FOR SURGICAL PLANNING (ESP)

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Purpose: to increase cost-effectiveness of neurosurgical decision making and incorporation of patient preferences for surgeries in eloquent cortex. Planning of neurologic surgery is based on the current characteristics of the patient's state, the functional significance of the involved brain areas and the form of surgical intervention. Risk – is an inherent property of neurosurgery. It is associated with decrease numbers of successful surgeries and probably will not get the expected outcome. Traditional selection and interpretation of cognitive task don't have a "capacity" to predict all possible neurocognitive outcomes of surgeries in eloquent cortex. Effective risk analysis and decision making in neurosurgery can be achieved by brain mapping of the structural invariant of cognitive functions.

Method: The methodology of risk analysis in neurosurgery involves statistical analysis, probability concepts, analysis of sensitivity and scenario analysis of neurological surgeries. The result of risk analysis is expressed as a probability distribution of possible values of main variables of neurosurgical planning. Functional magnetic resonance imaging (fMRI), intraoperative electrophysiologic testing (ECS), intracranial electroencephalography (iEEG) and magnetoencephalography (MEG) for surgical planning have been directed at identifying eloquent brain areas associated with cognitive functions such as language, attention, memory, executive functions. This serves as methodological bases for classification system of cognitive tasks for surgical brain mapping and relevant neurosurgical decision making. Language reflexes structure of cognitive functions by categories such as objects, properties and relations. They organize the structural invariants of cognition and can be tested with cognitive tasks. So brain mapping could be associated with neurocognitive competence to operate separately with objects, properties or relations during cognitive tasks.

Result: Neurocognitive dysfunctions and relevant neurosurgical risks can be divided into three groups: substrate (objects), attributive (properties) and relational (relations). This approach discovers new opportunities for more effective decision making strategies in neurosurgery by brain mapping structural invariants of cognitive function for surgical planning.

Conclusion: Brain mapping and cognitive tasks can discover the conflict between processes of operation with objects, properties or relations that could be an evidence of neurocognitive dysfunction. Resolution of conflicts between objects, properties, relations could decrease neurosurgical risks, increase the cost-effectiveness of neurosurgery and improve incorporation of patient preferences into neurosurgical decision making.

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19. ACCEPTABILITY OF TEXT MESSAGING AS A TOOL TO COMMUNICATE WITH CHRONIC LIVER DISEASE PATIENTS (ESP)

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Title: Acceptability of Text Messaging as a Tool to communicate with Chronic Liver Disease Patients

Purpose: This study evaluated the usefulness of text messaging (TM) for reminders, cancelling appointments and receipt of laboratory results in patients being evaluated in the liver clinic in an urban safety net teaching hospital. No prior study has examined the feasibility and acceptability of TM as a form of communication with specialty care patients in urban safety-net care settings. TM may be a more acceptable to patients who feel stigmatized by chronic Hepatitis C (HCV). Additional means of communicating with patients who are difficult to get hold off could increase show rates and improve treatment adherence.

Methods: A total of 100 patients completed a cross-sectional paper and pencil survey in an outpatient GI clinic over 4 weeks. Data collected included demographics, education level, baseline use of mobile phone and texting, and other communication modalities (such as home phone, email, post card etc.). 79% of subjects were between the ages 36 and 65. Subjects were 54% male, 41% Non-Hispanic White, 47% Black, 8% Hispanic, and 2% Asian.

Results: 89% reported having a cell phone. From this group 80% stated that they had ever used TM. 66% reported missing medical appointments at least once a year and forgetfulness was the most commonly cited reason (47%). Among subjects with a cell phone 52% used TM at least monthly. The majority (61%) claimed that TM reminders would be at least a little helpful. Greater than one-third of the sample felt that TM would be very helpful for appointment reminders, lab results or cancelling appointments. Frequency of TM was associated with finding TM as helpful for reminders (r=.56,p<.001) getting lab results (r=.44,p<.001) and cancelling appointments (r=.62,p<.001). Age, gender, and racial background were not associated with frequency of TM or preferences for TM.

Conclusions: TM has high acceptability among urban safety-net liver clinic patients. As TM usage grows, more and more patients will be interested in communicating with health providers via TM. Given the overall acceptability of TM reminders in this survey, TM reminders could be useful for promoting strict adherence among patients prescribed one of the new oral (three times per day) HCV treatments.

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20. PHYSICIANS AND COSTS: LACK OF INFORMATION OR LACK OF MOTIVATION? (ESP)

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Purpose: To examine the extent to which physicians know and consider costs when determinig diagnosis and deciding treatments

Method: A survey of 1010 physicians combined with information from other surveys and in depth-interviews.

Result: When asked abstract questions about whether they believed they should take social costs into consideration, most physicians agreed. However, when asked less abstract questions there was more disagreement. When asked about specific behaviour and preferences for varous treatment, they tended put very little weight on social costs. When asked about about their knowledge of varoous costs, most tended to underestimate the cost of expensive interventions and overestimate the cost of cheap interventions. Surprisingly the physicians who indicated that they were motivated to consider costs, often did not know more about costs than those who were less motivated.

Conclusion: Cost containment is not caused mainly by doctors lack of motivation to consider costs, but by a regulatory system which makes it difficult for the doctor both to know and take costs into considerations. Relatively simple information systems have been show to have some effect, but the main cause, in the view of the physicians, is the weak external regulation.

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21. SHOULD CELL FREE FETAL DNA TESTING REPLACE ANTENATAL RHESUS IMMUNE GLOBULIN ADMINISTRATION? (ESP)

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Purpose: To determine whether cell free fetal DNA (cffDNA) testing should replace antenatal rhesus immune globulin (RhIG) administration as the standard of care in Rhesus D (RhD) negative women.

Methods: A decision analytic model was designed to compare use of cffDNA testing versus antenatal RhIG. Women who were RhD negative, unsensitized, and in a first pregnancy with unknown partner blood type were the basis of the model. Our primary outcome was maternal risk of alloimmunization to RhD in the pregnancy. Sensitivity and specificity of FFD testing were obtained from a meta-analysis and reported as 0.954 (95%CI 0.906-0.978) and 0.986 (95%CI 0.964-0.995) respectively. From the same meta-analysis, positive predictive value was 0.972 and negative predictive value was 0.969. Univariate and bivariate sensitivity analyses, as well as Monte Carlo simulation and threshold analyses, were performed.

Results: Rhesus immune globulin administration is the most effective strategy for preventing alloimmunzation. In a population of 1000 Rhesus negative women, 13 sensitizations would occur with utilization of cffDNA screening for fetal Rhesus type. However, 0.6 sensitizations would occur per 1000 women with routine antenatal administration of antenatal RhIG. Varying the sensitivity of the cffDNA test changed the rate of alloimmunization. Nevertheless, even if a cffDNA test had 100% sensitivity, there was still a higher rate of alloimmunzation compared to standard RhIG. We varied the probability of having an Rh positive fetus from 0 to 1 to account for heterozygosity of Rh in different populations. Our results remained consistent across all probabilities of fetal Rh status.

Conclusion: Adoption of cell fetal free DNA testing in lieu of antenatal rhesus immunoglobulin as the standard of care would result in a 20 fold increase in alloimmunization among RhD negative women.

Sensitivity Analysis, Rate of Alloimmunzation (per 1000)

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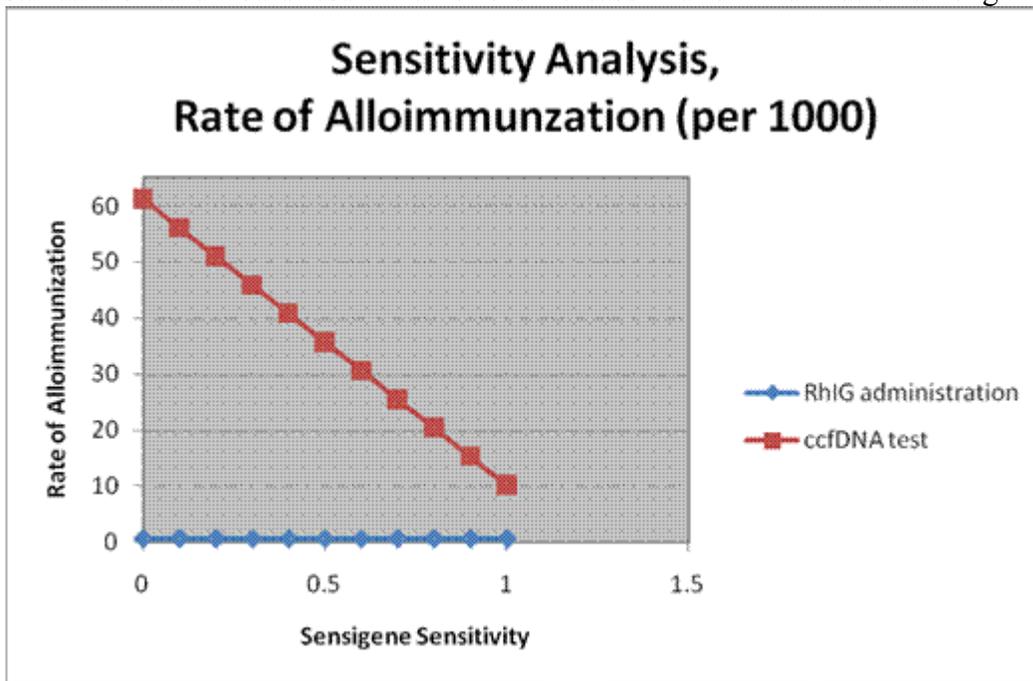
22. CATHETER ABLATION STRATEGIES FOR RHYTHM CONTROL IN PATIENTS WITH ATRIAL FIBRILLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS (ESP)

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Purpose: To evaluate the comparative effectiveness of pulmonary vein isolation (PVI) versus PVI plus adjuvant atrial ablations (PVI+) in patients with atrial fibrillation (AF).

Method: A systematic review of literature, published before October 2010, was undertaken to include randomized and non-randomized controlled trials evaluating clinical efficacy, effectiveness, or safety of ablation procedures in adult patients with AF.

Result: Of 2,726 potential citations identified by the original search 17 randomized controlled trials and 3 non-randomized trials were included. Our meta-analysis revealed that at 12 months, AF patients who underwent PVI+ strategies had a significantly higher rate of maintaining sinus rhythm than those who underwent PVI alone (RR 1.09, 95% CI 1.01, 1.16). However, subgroup analysis was significant for only PVI+ left atrial (LA) linear ablations (RR 1.18, 95% CI 1.05, 1.32). Overall, the pooled success rates were higher in PVI+ group in both subgroups of paroxysmal (RR 1.14, 95% CI 1.05, 1.24) and persistent/permanent AF (RR 1.70, 95% CI 1.16, 2.49). The effect of PVI+ LA ablation was greater in persistent/permanent AF patients than those with paroxysmal AF. Technical approaches used for PVI (segmental or circumferential) did not make any difference in the superiority of PVI+ LA linear ablations to PVI alone. The summary estimates of effect were 1.17 (1.05, 1.31) and 1.08 (1.02, 1.14) for segmental and circumferential PVI groups, respectively. Our review found insufficient data to evaluate the impact of study interventions on stroke, heart failure, procedural complications and mortality.

Conclusion: PVI+ strategies appear to result in significantly higher success rates than PVI alone in the first year after the procedure. Studies of longer duration are needed to evaluate the long-term benefits and safety of different adjunctive ablation approaches for rhythm control in AF patients.

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23. CONSIDERATIONS FOR TARGETED RECRUITMENT OF PATIENTS WITH A CHRONIC CONDITION USING AN ONLINE SURVEY (ESP)

Kristin M. Khalaf, PharmD[1], Sonya Eremenco, MA[2], Denise Globe, PhD[1], Edward P. Armstrong, PharmD[3], Daniel C. Malone, RPh, PhD[3] and Karin Coyne, PhD, MPH[2], (1)Allergan, Inc, Irvine, CA, (2)United BioSource Corporation, Bethesda, MD, (3)University of Arizona, Tucson, AZ

Purpose: Research has suggested that patients with urinary symptoms associated with multiple sclerosis (MS) are reticent to discuss these symptoms with a health care provider. The feasibility of an online survey to measure the impact of bladder symptoms on health-related quality of life (HRQL) among community-dwelling patients with MS was assessed.

Method: An online cross-sectional survey was developed for administration to a convenience sample of US-residing MS participants. Several MS-specific patient advocacy organizations collaborated by posting a description of the study in electronic newsletters, websites, and affiliated social media pages. To ensure that participants completed the survey only once, internet protocol (IP) and email addresses were recorded. Participant contact information was stored in a separate dataset from the survey and kept secure and confidential. Participants completed the survey following screening for inclusion criteria (US resident, 18-89 years of age, self-reported physician diagnosis of MS, currently using medication to treat MS symptoms) and informed consent. Information pertaining to demographics, disease history and severity, productivity, urinary symptoms, and if applicable, urinary symptom treatment patterns was collected. General (Short Form 36 version 2 (SF-36v2)) and disease-specific (Overactive Bladder Questionnaire – Short Form (OAB-Q SF)) HRQL was assessed.

Result: The survey was fielded from January 1, 2011 through May 1, 2011. A total of 4,629 participants accessed the website, and 2,348 completed the screening process. Of the 1,700 completed surveys, 630 participants were excluded by the tracking system, leaving 1,070 viable survey submissions. The screening process was not completed by 2,281 participants: 1,932 participants did not complete informed consent, 344 consented but did not complete screening, and 5 actively did not consent. Of those eligible, 49 did not complete the survey, including 6 voluntarily ending early, 35 not returning to complete a partial survey within 72 hours, and 8 for other reasons.

Conclusion: Close collaboration with MS patient advocacy organizations is critical in recruiting MS participants with a diversity of symptoms to participate in an online research study. The anonymity of an online survey may be helpful in assessing the burden of an often embarrassing symptom such as incontinence in participants with an underlying debilitating disease. However, technological safeguards and careful screening processes are necessary to ensure that participants meet eligibility criteria, particularly when a financial incentive is offered.

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24. PHYSICIANS AND COSTS: LACK OF INFORMATION OR LACK OF MOTIVATION? (ESP)

Ida Iren Eriksen and Hans Olav Melberg, PhD, University of Oslo, Oslo, Norway

Purpose: To examine the extent to which physicians know and consider costs when deciding treatments, and what regulatory regimes or tools they would preferred to make cost awareness a more prominent part of the decision to treat.

Method: A survey of 1010 physicians combined with information from other surveys and in depth-interviews.

Result: 84% agrees that it is the duty of a physician to take costs into consideration when treating patients. However, when asked less abstract questions about specific behavior and preferences for various treatments, they tended to put very little weight on social costs. When asked to estimate the costs of treatments, less than 50% estimated a price within an interval of 50% of the correct price. Most tended to underestimate the cost of expensive interventions and overestimate the cost of cheap interventions. Only 17% had sought information about the cost of a treatment at least once a month during the last year. Surprisingly the physicians, who indicated that they were motivated to consider costs, often did not know more about costs than those who were less motivated. We analyze differences in motivation and knowledge in the subgroups specialty, demographics and personality-type (Basic Character Inventory).

Conclusion: Lack of cost-consciousness in the health care system increasingly leads to favoring of patients with less severe health problems at the cost of patients whose only option to be able to carry on leading their lives are medical treatment. As a matter of principle, physicians are in favor of considering costs when treating their patients, but this principle shows difficult to implement in practice due to an array of causes and circumstances. We conclude that cost containment is not caused mainly by doctors' lack of motivation to consider costs, but by a regulatory system which makes it difficult for doctors both to know and take costs into considerations. Relatively simple information systems have been shown to have some effect, but the main cause, in the view of the physicians, is the weak external regulation.

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25. ARE PREGNANT WOMEN RATIONAL? AN ANALYSIS OF AMNIOCENTESIS CHOICE (BEC)

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Purpose: In this paper, we analyze pregnant women's decision towards the prenatal diagnosis of Down's syndrome (amniocentesis); the trade-off is between doing the test which increases risk of miscarriage and not doing it with a risk of giving birth to a child suffering from Down's syndrome.

Method: We use a unique database with exact information on the risk of Down syndrome (as estimated from the blood sample after 14 and 18 weeks pregnancy), the mother's age and amniocentesis decisions for a large sample of pregnant mothers, who took the free screening test between 2003 and 2007 in a French maternity hospital (Robert Debré). We have built a basic model in a standard expected utility (EU) framework and we have estimated it empirically by using the previous database. Thus, we have implemented an econometric approach, in which observed behaviours are supposed to reveal women's valuations of Down's syndrome.

Result: We obtain an estimation of the distribution of the implicit value of a foetus death for women in the database. Using a scale on which the value of a child affected by the Down syndrome is 0 and the value of a healthy child is 1, the mean value for a death foetus is roughly 1/3 (meaning that, on average, women are indifferent between abortion on one hand, and a lottery where their new born child is affected with the Down syndrome with probability 2/3). Interestingly, the theoretical implicit value of a foetus death that can be deduced from the legislation (using the risk threshold at which amniocentesis is reimbursed by the Health System) is 2/3.

Conclusion: One can interpret this difference as an indication that women actually give a substantially higher value to child affected by the Down syndrome than the society does.

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26. MAXIMIZERS AND SATISFICERS IN THE EMERGENCY DEPARTMENT (BEC)

Edward S. Bessman, MD, The Johns Hopkins School of Medicine, Baltimore, MD and Douglas E. Hough, PhD, The Johns Hopkins Carey Business School, Baltimore, MD

Purpose: We investigated whether being a maximizer or satisficer influences an Emergency Department (ED) provider's individual throughput performance.

Methods: We hypothesized that, because of the workload and need to make decisions rapidly, ED providers will tend to be satisficers, rather than maximizers, and that those who are maximizers will see fewer patients per hour and use more resources than satisficers. Attending physicians, residents, and mid-level providers from four affiliated acute-care hospitals were invited to take part in a web-based survey. The survey included a published, validated, 6-item maximization scale, which ranged from 1 to 7. A score of 4 or more indicated that an individual had maximizer tendencies. Each respondent was subsequently linked to an administrative database that reported that individual's personal ED throughput performance in terms of patients-per-hour (PPH). Because of inherent variability in PPH due to different practice location and provider status, a median performance was computed for each group of providers (e.g. mid-levels at hospital A). Each individual was referenced to the median for their respective group, with a PPH greater than the median being identified as "fast". Accordingly, each respondent was characterized as a maximizer or satisficer, and as fast or slow. A 2-by-2 contingency table was used to compute the chi-square. We also used regression analysis to analyze the raw data, holding constant profession (physician, nurse practitioner, physician assistant), hospital, years in practice, and gender.

Results: Of the 173 providers who were invited to participate, 94 responded for an overall response rate of 54%. Three later declined to have their results included; complete data were available for 84 subjects. Scores on the maximization scale ranged from 1.82 to 5.83, with a mean of 3.84 and a median of 3.75. Raw PPH ranged from 0.13 to 2.95. The chi-square was 0.028 with a p-value of 0.867. In the regression analysis, the maximization scale was never statistically significant.

Conclusions: Contrary to our hypothesis, the ED setting includes both maximizers and satisficers. In addition, those who are maximizers do not see fewer patients per hour or use more resources. It appears that ED providers who are maximizers have been able to overcome potential biases in decision-making.

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27. PAYMENT STRUCTURES IN THE MEDICAL COMMUNITY: AN EXPERIMENTAL STUDY (BEC)

Ellen Green, MA, Virginia Tech, Blacksburg, VA

Purpose: In this study we focus on the dual principal-agent problem in which agents have other-regarding preferences. In the dual principal-agent problem an agent has responsibilities to two different principals. For instance, a physician is an agent of their patients and an agent of their health care employer. A critical feature of this study is that there is an interior solution for the number of services provided to the client (the patient). While the agent is assumed to know this critical value, the employer only knows what the average value should be over all downstream principals, and the downstream principal, or client, has very little information.

Method: Our study uses experimental methods to analyze the relative performance of a variety of compensation contracts. This study creates an environment in which individuals are paid via common payment structures employed in the medical community (Fee For Service, Capitation, Salary, etc.) to study the effect that different incentive structures have on agent behavior. We specifically address the effect that other-regarding behavior has on decision making in the physician-patient relationship.

Result: Our results suggest that the existence of other-regarding behavior substantially affects choices made by agents and shows that some compensation contracts outperformed others on a variety of measures. These results also suggest that classic contract theories were misleading. In this study, the payment structure that resulted in the highest quality service was the Salary contract; where in classic theory a salaried agent would under provide services relative to the other compensation contracts.

Conclusion: Standard contract theory emphasizes the need for a direct link between the final product provided by the agent and their compensation for services. However, this study brings to light that this may not be necessary to achieve a high quality of service in the dual-principal agent problem. When taking into account the significant effect that other-regarding behavior has on an individual's utility, agents do not need to be directly incentivized to provide high quality services.

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28. RANDOMIZED TRIAL OF PAIRED AND TRIPLET PROFILE CHOICE TASKS IN THE ELICITATION OF PATIENT PREFERENCES FOR HEARING AIDS WITH CONJOINT ANALYSIS (BEC)

John F.P. Bridges, PhD[1], Karin.G.M. Groothuis-Oudshoorn, PhD[2] and Christine Buttorff, BA[1], (1)Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, (2)University of Twente, Enschede, Netherlands

Purpose: Most applications of conjoint analysis in health use choice tasks with two profiles, while marketing studies routinely use three or more. This study reports a randomized trial of paired and triplet profile choice formats experiments focused on hearing aids.

Methods: Respondents with hearing loss were drawn from a nationally representative cohort complete identical surveys were randomized between choice tasks with two or three profiles. When they were offered, respondents also provided a full ranking of the three profiles cases. Baseline differences between the two groups were explored using ANOVA and C^2 tests. The primary outcomes i.e. the differences in estimated preference models were explored using Wald and t-tests and analysis of individual level models estimated by ordinary least squares.

Results: 500 respondents participated in the study, but 127 had no hearing loss, 28 had profound and 22 declined to participate and were excluded from analysis. Of the remaining 323 participants, 146 individuals were randomized to the pairs and 177 to triplets, but the only significant difference between the groups was time to complete the survey (11.5 and 21 minutes respectively). Pairs and triplets produced identical rankings of attribute importance but homogeneity was rejected (P=0.0001). Pairs led to more variation, and were systematically biased toward the null, given a high proportion (32.2%) lexicographic respondents (i.e. respondents who did not trade across attributes), while all respondents in the triplet traded across attributes. The relative benefits of a full ranking also dominated pairs, but were not conceptually different form a single choice triplet.

Conclusions: The number of profiles in choice tasks affects the results of conjoint analysis studies. Here triplets are preferred to pairs as they avoid non-trading and allow for more accurate estimation of preferences models, but the benefits of requiring a full ranking of the three profiles are less clear.

29. QUESTIONING THE NEUTRALITY OF DECISION AIDS (BEC)

Jennifer Blumenthal-Barby, Ph.D., Baylor College of Medicine, Houston, TX

Purpose: To develop criteria for defining and measuring the neutrality of decision aids in light of data from behavioral economics showing the influence of framing effects on patient decision making.

Method: Systematic review of the literature.

Result: The International Patient Decision Aids Standards Collaboration (IPDAS) has developed criteria for the development and evaluation of decision aids. One of those criteria is that decision aids must be neutral. What exactly neutrality means, whether neutrality is possible in light of data from behavioral economics showing the influence of framing effects on decision making, and whether neutrality is always desirable are important and unexamined questions that surround the criterion of neutrality. Clarification on these points is especially important in light of the fact that health reform is calling for the certification of all patient decision aids.

Conclusion: The two main dimensions of neutrality are balance and bias. Balance is achieved when both sides are presented, and one side is not helped more than the other—the sides have equal modes and times of information presentation. Unbiased presentation requires an absence of framing effects that induce biases such as loss aversion bias, availability bias, recency or primacy bias, anchoring bias, and default bias. Whether a decision aid manages to achieve balance in presentation and to avoid inducing the aforementioned biases can be tested and measured. We argue, however, that neutrality is not always desirable in decision aids, nor is it always a realistic goal. Using the example of a decision aid for medication versus surgical treatment of cardiac disease, we argue that presenting medication as the default is the ethically appropriate course of action despite the fact that it would induce the default bias, resulting in a bias towards medication, and as such not meet the IPDAS criterion of neutrality.

30. BETWEEN PROD AND PERSUASION: INQUIRY INTO THE NATURE AND JUSTIFICATION OF HEALTH NUDGES (BEC)

Yashar Saghai, MA, Kennedy Institute of Ethics, Washington, DC

Purpose: Many support the use of insights from behavioral economics to improve health via the design of the environment in which individuals make health-affecting choices. There is, however, an on-going controversy as to whether these strategies are ethically permissible. I will argue that a pervasive confusion about the nature and justification of health nudges has hindered this debate.

Method: Thaler and Sunstein define nudges as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (2009, 6), and view them as part of a choice-preserving strategy designed to promote wellbeing when cognitive biases prevent optimal decision-making. Conceptual analysis reveals that the authors conflate (1) the class of tools used to obtain behavior change (tools that alter the target's *perception* of the choice situation); (2) the function of nudges as a means to achieve one's aims (as distinguished from coercion, for instance); (3) the justification of nudges in terms of the problems they may solve (these problems may (but need not) be framed in terms of the theoretical commitments of behavioral economics with regard to rationality).

Result: As a result, many examples that Thaler and Sunstein provide do not satisfy all the criteria they cite when defining nudges. For instance, even though "make-believe speed bumps" are designed to alter the driver's perception of the choice situation thanks to 3-D painted triangles, they function as a coercive means to modify the driver's behavior. Their message could be translated as, "Slow down or crash!"

Conclusion: I will therefore conclude that nudges should not be confused with the class of tools they typically use. Rather, the definition of nudges should pragmatically focus on the *function* they play as a *means* for achieving one's aims distinct from coercion, incentives (or prods), and rational persuasion. In addition, questions relative to the *aims* of nudges concern their *justification*, such as whether nudges should be in-line with the recipients' second-order preferences about what to eat or can (under some conditions) shape those preferences; whether they ought to directly promote each individual's wellbeing or foster population-level health; and whether they should compensate for the effects of irrationality or be used to steer individuals toward a choice that is morally required or praiseworthy.

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31. PROJECTION BIAS AMONG PERSONS RECEIVING SPINAL INJECTION AS TREATMENT FOR LUMBAR PAIN (BEC)

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Purpose: Work at the intersection of psychology and economics has documented that people are often unable to accurately predict how their preferences and feelings will change when they are in a different state. Behavioral economists have labeled this phenomenon "projection bias" in predicting one's future choice behavior. A person not in pain may have trouble understanding the value of pain-reduction if she were in fact in pain. Similarly, a person in extreme pain may overestimate the value placed on reducing modest amounts of pain. Our study seeks to understand whether these types of projection bias exist. We examined willingness-to-pay for pain relief and its association with pain level before and after spinal injection treatment among persons with lumbar pain.

Method: We conducted face-to-face interviews with persons completing treatment in a pain clinic for lumbar stenosis (N=17). Subjects were 53% male, 63% white, 37% black and the median age was 46. Prior to treatment, subjects were asked their willingness to pay (WTP) to be free of imagined pain rated a 3, 5, 7 and 10. After treatment, subjects were asked their willingness to pay for relief of their remaining post-treatment pain. Based on the imagined pre-treatment pain levels we computed linear extrapolations for pain levels 1-10 and compared responses to WTP at the imagined/extrapolated pain levels to the WTP post-treatment in order to quantify projection bias. We then examined projection bias by pre-treatment pain level, and pre-post change in pain.

Result: Five subjects (29%) had perfect predictions based upon their imagined pain states. Three subjects (18%) had higher than predicted WTP (one of whom had a pain increase). The remaining 9 subjects (53%) all gave answers in line with projection bias (lower than predicted post-treatment WTP). Subjects with pre-treatment pain > 7 had higher projection bias (p=.02) and projection bias was correlated with magnitude of pain reduction (r=.47, p=.05).

Conclusion: We found evidence of projection bias in this pilot. Our findings suggest a need to account for projection bias when using contingent valuation methods to establish the potential benefits of pain-reduction therapies. Projection bias may also be creating an empathy disconnect for doctors and nurses (who are

generally in a non-pain state) trying to weigh costs and benefits of different pain-reduction strategies for their pain patients.

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32. A BEHAVIOR-DRIVEN MATHEMATICAL MODEL OF MEDICATION COMPLIANCE (BEC)

Tuan Dinh, PhD and Peter Alperin, MD, Archimedes Inc., San Francisco, CA

Purpose: It is estimated that 30-50% of patients do not take medication as prescribed by their physicians, costing the American healthcare system billions of dollars annually in avoidable medical expenditure. Medication non-compliance is a complex phenomenon, determined by the interplay of multiple factors, including patient-, condition-, and therapy-related health system factors, as well as social factors. We are developing a mathematical model for medication compliance that accounts for the underlying psychological processes of patient behavior. This will facilitate a deeper understanding of the effects of interventions designed to improve compliance as well as the resultant health and economic effects of these interventions.

Methods: The process of obtaining and taking medication is broken down into basic thought processes and actions. The pathway model of medication adherence is a synthesis of several psychological theories of medication compliance, including the Self-Regulatory Model and the Health-Belief Model. Standard questionnaires and scales such as Beliefs about Medicines Questionnaire, Illness Perception Questionnaire (IPQ), and Barriers in Diabetes Questionnaire are used to quantify key cognitive and psychological variables (e.g. perceptions about medical benefits and disease severity) and mental states (e.g. self-efficacy). Correlations between psychological variables and mental states on medication adherence were derived from a meta-analysis of the literature. The output of this integrated model is medication adherence as a function of time. Each patient's likelihood of adhering to medication recommendations changes over time, depending in part on his/her changing perception about disease severity, benefits of medication, and experience of disease symptoms and medication side-effects.

Results: We apply the current approach to model adherence to diabetes medication. At the population level, the model reproduces the dependence of medication adherence on socioeconomic and clinical risk factors. At the individual level, the model captures the transient effects of life events and behavioral interventions on adherence. We use the model to examine the effects of educational interventions designed to improve patient knowledge about disease severity on medication adherence.

Conclusion: We demonstrate that it is possible to construct a detailed, "mechanistic" mathematical representation of medication adherence. Such a model can be integrated with disease models to forecast health and economic effects of interventions aimed to improve medication adherence.

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33. UNCERTAINTY, GAINS, LOSSES, PROBABILITY… WHAT IS MORE IMPORTANT IN TREATMENT PREFERENCES? (BEC)

Karen M. Kramer, PhD, University of Kansas School of Medicine - Wichita, Wichita, KS

Purpose: Two treatment preference measures were designed with behavioral economic principles in mind; with a goal of studying whether variations in the symptoms alleviated (gains), side effects (losses), overall chances of these (probability of joint receipt of gains and losses), or uncertainty was the most influential on a patient's responses.

Method: Participants were 55 male veterans with prostate cancer receiving care from the urinary and cancer clinics at Edwards Hines Jr. VAMC. Two preference measures featuring hypothetical health treatments were given to all participants. Each measure varied the gains, losses, probability, and uncertainty in alleviations and chances. The two preference measures were the Preference Indicator for Cancer Treatments with Uncertain and Risky Elements (PICTURE), and the Standard Gamble (SG). Conjoint analysis was used to extract the part-worth utility and "importance" of each experimentally controlled feature of six treatment decisions presented to each veteran. Choices from the PICTURE were converted into ranks, and used a nonmetric model. Preferences from the SG were analyzed with a metric model.

Result: Analyses were conducted within each uncertainty type and preference measure, and at group- and individual-levels. Higher importances indicated which treatment features seemed to induce the most variation in responses. There was variability in importances of the treatment features; between preference measures and over all participants. The majority of veterans followed the same patterns in individual importances. Part-worth utility values indicated details of treatment feature preferences.

Conclusion: Gains, losses, probability, and uncertainty were emphasized differently across the preference measures, and across different types of uncertainty. With the PICTURE preference measure, the probability of jointly receiving alleviated symptoms and side effects, then symptom alleviation, appear to direct the treatment decisions. When using the Standard Gamble preference measure, the probability is more influential than side effects, on decisions between certain treatments, and between treatments with uncertain improvements. In treatments with uncertain chances, surprisingly, probabilities are not influential and preferences vary only with side effects and then improvements. The PICTURE is more stable in preference elicitation when different types of uncertainty are introduced in the treatment description. SG responses change greatly with uncertain information. Information presentation in treatment options can affect individual- and group-level treatment decisions.

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34. ASSESSING THE INFLUENCE OF DELAY DISCOUNTING OF FUTURE HEALTH ON DIET AND PHYSICAL ACTIVITY BEHAVIORS: DOES IT DIFFER BY BODY MASS INDEX CATEGORY? (BEC)

Kimberly Bosworth Blake, PharmD, MBA, PhD, Auburn University Harrison School of Pharmacy, Auburn, AL and Carole V. Harris, PhD, West Virginia University School of Medicine, Morgantown, WV

Purpose: Delay discounting is a measure of how individuals value the future, with higher rates of discounting indicating lower value of future rewards. Previous research has demonstrated a negative association between degree of discounting and certain preventive health behaviors, but the influence of weight status on this relation has not been studied. The objective of this study was to determine whether degree of delay discounting influences healthful diet and physical activity (PA), and how this differs in overweight/obese individuals compared to underweight/healthy weight individuals.

Method: Computer-administered surveys were conducted in adults (n=172). Items included diet and PA behaviors, height, weight and demographic variables. Body Mass Index was calculated using self-reported height and weight and used to categorize participants as underweight/healthy weight (<25) or overweight/obese (>=25). Degree of delay discounting for both health and monetary rewards was assessed separately using a binary choice, decreasing adjustment algorithm, and was measured using normalized area under the delay discounting curve (AUC).

Result: More than half (53.6%) of participants were categorized as either overweight or obese, based on self-reported height and weight. AUC was not significantly correlated with preventive behaviors for either health or monetary rewards in the overall sample. Mean square root-transformed AUC for monetary rewards was

significantly lower (indicating a higher discount rate) in overweight/obese individuals (0.516 ± 0.219) compared to underweight/healthy weight individuals (0.590 ± 0.236) [t(166) = 2.11, p=.037]. Fewer overweight/obese participants met the guidelines for weekly PA (62%) compared to underweight/healthy weight participants (84%) [X^2=9.96, p=.002]. Diet score was significantly lower for participants identified as overweight/obese (25.8 ± 7.04) compared to those categorized as underweight/healthy weight (29.9 ± 6.27) [t(166) = 3.95, p<.001]. AUC for monetary rewards was significantly correlated with diet score in underweight/healthy weight individuals (r=.255, p=.024), but not in overweight/obese individuals.

Conclusion: No association between degree of discounting and behavior was detected in the overall sample. However, when the sample was divided according to weight status, better diet quality was associated with greater value of the future in underweight/healthy weight individuals, but not in overweight/obese individuals. This may indicate a more complex association between self-controlled choice and behavior in overweight/obese individuals. Further research using larger sample sizes is needed to untangle these complex associations.

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35. SHOULD PATIENTS WITH RESPIRATORY TRACT INFECTIONS REFRAIN FROM EXERCISE, STAY INDOORS OR STAY IN BED? SURVEY OF GENERAL PRACTITIONERS` JUDGEMENTS IN POLAND AND NORWAY (BEC)

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Purpose: For patients with respiratory tract infections evidence regarding bed rest, staying indoors and refraining from physical exercise is sparse. We wanted to explore how general practitioners (GPs) in Poland and Norway would advice such patients.

Method: Convenience samples of GPs in Poland (n=216) and Norway (n=171) read four vignettes in which patients presented symptoms consistent with pneumonia, sinusitis, common cold and exacerbation of chronic obstructive pulmonary disease (COPD), respectively. For each vignette the GPs were asked whether they would recommend staying indoors, staying in bed and refraining from physical exercise, and if so, for how many days. We used log-Poisson and ordinary least squares (OLS) regression to analyse differences between Polish and Norwegian GPs. Workload, specialty attainment, years of working experience and sex were included as potential confounders.

Result: For each vignette the proportions of GPs recommending the patient to stay indoors in Poland versus Norway were 98% versus 72% (pneumonia), 92% versus 26% (sinusitis), 87% versus 9% (common cold) and 92% versus 39% (exacerbation of COPD). Adjusted relative risks (95% CI) for recommending the patient to stay indoors in Poland versus Norway were 1.4 (1.2-1.5), 3.7 (2.8-4.8), 10.6 (6.3-17.7) and 2.5 (2.0-3.1) respectively. Among those who would recommend the patient to stay indoors, mean durations were 8.1, 6.6, 5.1 and 6.7 days in Poland versus 3.2, 2.8, 2.6 and 4.1 days in Norway, respectively. In OLS regression models differences in duration were statistically significant. Polish GPs were also more likely to recommend the patient to stay in bed and refrain from exercise, and for a longer time, than their Norwegian colleagues. With few exceptions differences remained statistically significant in regression models. For the patient with pneumonia 15%, 11% and 18% of the GPs would recommend staying indoors for three, five and seven days respectively, compared to 3%, 2% and 1% for four, six and eight days. Similar patterns were observed across all vignettes for bed rest, staying indoors and refraining for exercise.

Conclusion: GPs in Poland were more likely to recommend bed rest, staying indoors and refraining from exercise, which suggests that they perceived the cases as more serious than did their Norwegian colleagues.

The inclination to recommend restrictions for three, five or seven days might indicate digit preferences in the GPs` judgments.

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36. THE IMPACT OF PEER PRESSURE AND RISK PREFERENCE ON SMOKING, DRINKING AND DIETING BEHAVIOR AMONG JAPANESE ADOLESCENT AND COLLEGE STUDENT (ESP)

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Purpose: The purpose of this study is to examine the existence and impact of peer effect and individual risk attitude on smoking, drinking and dieting behavior among Japanese college students and adolescent.

Method: The primary contribution of this study is in its measurement variable, which allows for a critically different strategy for identifying peer effects. Although many peer effect indices have been put forward in previous researches, there have been few studies that analyzed the nature of these indices. Methods for empirical research must be studied carefully because effects vary according to the nature of the social interaction factor index.Second, we also considered the effect of individual risk preference as a factor separate from social interaction effect. Risk preference is an individual-specific attitude toward risk, which is intimately linked to risky behaviors. There are few studies to investigate the relation between peer effect and risk preference explicitly.The behaviors measured in our survey represent some of the most significant and well-known behavioral influences on health status; smoking, drinking, and excessive diet.Besides information on risky behaviors, risk preference and background characteristics for all individuals between 15-22 years old in Japanese adolescent and college students, the data reveals which school, class and reference group each individual participates in. Binary choice logit model was used to estimate.

Result: In all specification, significant peer effects and risk preference were found for drinking and smoking. The impact of peer behavior is larger among females and young people.

Conclusion: This study demonstrated the existence of peer effect on risky behaviors among young people in Japan. For health policy, the potential existence and magnitude of peer effect is of interest, since peer effects may dominate the effects of policy interventions.

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37. FACTORS IN INFORMED DECISION MAKING IN HEPATITIS C TESTING (DEC)

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Purpose: More than 3 million Americans are infected with hepatitis C virus (HCV). There is disagreement on the utility of routine testing for those at increased risk. We educated and assisted at-risk patients in making an informed decision about HCV testing using decision counseling, a method to aid patients in making a decision in line with their values and preferences.

Method: Patients were eligible to participate if they had at least one HCV risk factor (injection drug use, time in prison or jail, tattooing, partner with HCV, needle-stick injury, kidney dialysis or blood transfusion).

Patients completed a baseline survey, attended a session with a health educator to review a study-specific booklet and underwent decision counseling. During decision counseling, patients provided up to three factors (reasons) for or against HCV testing and rated their factors based on intensity of feeling and the level of influence. A preprogrammed algorithm computed their preference (for or against testing). After decision counseling, patients had the opportunity to talk about testing with their physician. We content analyzed the factors for or against testing and used SPSS to calculate the number of factors per patient.

Result: Seventy-eight patients met with a health educator and 70 (90%) agreed to have decision counseling. Among those who completed decision counseling, 79% preferred to be tested for HCV, 1% were neutral about testing, and 20% preferred not to test. Among those who preferred to test 40% listed two factors in favor of testing, 38% listed one factor, and 22% listed three factors. The most frequent factor was wanting to know their HCV status (31%), followed by being worried about having a risk factor (29%). Among those not in favor of testing, 64% provided one factor against testing, and 36% provided two factors. No one provided three factors against testing. The most frequent factor (73%) for not testing was not feeling the need to test. Twenty-three patients (42%) who were in favor of testing have tested, while none of the patients not in favor of testing have tested.

Conclusion: This brief informed decision making effort appears to be an effective way to assist at-risk patients in making a decision about hepatitis C testing that is in line with their personal values and preferences.

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38. END-OF-LIFE DECISIONS IN THE HOSPITAL; WHAT DO PATIENTS PREFER? (DEC)

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Purpose: In the Netherlands one third of all deaths (n=35,000 per year) occurs in a hospital. Complex medical decisions are often needed for patients admitted to the acute hospital for whom cure or recovery can not be obtained anymore. In this study we investigated preferences on end of life care of patients who died in the hospital.

Method: All general wards (17) and a specialised unit for acute palliative care in a Dutch university hospital participated in this study. Relatives of adult patients who died on one of these wards were asked to complete a questionnaire 3 months after the patient's death. We analyzed questionnaires received between September 2009 and February 2011 about 195 patients.

Result: The median age of the deceased patients was 67 years, 56% were male and 49% had cancer. The median length of the last hospitalization was 11 days. In the last month of life 49% of the patients had not discussed any preferences on end-of-life care. The other 100 patients had discussed their preferences, mostly with their spouse (33%) or children (29%). According to relatives a minority had discussed end-of-life preferences with their medical specialist (23%) or general practitioner (17%). Most common preferences were no life-prolonging treatments, such as resuscitation or surgery (32%), or a wish for euthanasia (13%). 22% of the patients preferred intensive symptom treatment to prevent suffering, e.g. intensive pain treatment or continuous palliative sedation therapy. On the contrary, 13% preferred all possible treatments to prolong life, like organ transplantation or chemotherapy. Others (11%) mentioned non-medical preferences, e.g. no admittance to a nursing home or the appointment of a surrogate decision maker. 38% of the patients had undertaken activities to complete their lives, e.g. traveling, or to prepare for death, e.g. by selecting music for their funeral. Although only 29% of patients had discussed their preferred place of death, 70% of the relatives

thought the patient wanted to die at home. However, 85% of the relatives were satisfied with the hospital as place of death.

Conclusion: Half of the patients discussed preferences on end-of-life care with others, but only a small minority had informed their physician about their preferences. Shared decision making at the end-of-life is the responsibility of patients and physicians and there certainly seem to be opportunities for improvement.

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39. RISKS AND BENEFITS OF PROSTATE BIOPSY FOLLOWING AN ABNORMAL PSA SCREEN IN GENERAL AND IN A SPECIFIC PATIENT: DECISION ANALYSES (DEC)

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Purpose: Although not ideal, discussion about outcomes after prostate cancer treatment sometimes occurs only after an elevated PSA screening test is found. The choice of whether or not to proceed to biopsy may depend on patient preferences. We performed decision analyses to determine if men with an elevated PSA should undergo a prostate biopsy.

Method: For 65-year-old men with an elevated PSA and no other prostate cancer risk factors, we built a Markov model comparing five strategies: no biopsy (Bx); Bx with active surveillance (AS) for low grade cancer, followed by either radiation (R) or radical prostatectomy (RP) for subsequent progression; Bx with RP at diagnosis; and Bx with R at diagnosis. For higher grades of cancer found on biopsy, we made the assumption that patients would receive therapy (R) at diagnosis, and these results are incorporated into life expectancy (LE) and quality adjusted life years (QALYs) for all biopsy strategies. We used a previously validated nomogram for predicting prostate cancer on biopsy and published literature for all other estimates including progression, mortality (SEER) and utilities. We also considered a specific patient referred to our consultation service, and modeled his utilities using constant risk aversion (RA), reflecting his response to both standard gamble and time trade-off questions, and discounted his QALYs accordingly.

Result:

	LE (yr)	QALY General	QALY Index Patient
No Bx	11.8	8.9	5.9
Bx Low Grade AS then R	12.5	10.3	6.7
Bx Low Grade AS then RP	12.5	10.3	6.7
Bx Low Grade RP	12.6	10.2	6.9
Bx Low Grade R	12.6	10.3	7.0

In sensitivity analyses, no Bx was equivalent to definitive radiation therapy (for both low and high risk prostate cancer), and preferred over other strategies only if quality of life without biopsy was perfect. For quality of life with no Bx of 0.99 or less, all biopsy strategies were preferred. In the index patient, no Bx was similarly the least favored strategy, with overall lower QALYs reflecting risk aversion.

Conclusion: These analyses support performing a prostate biopsy given an elevated PSA for its benefit in LE and QALYs. Foregoing biopsy would only be a viable option in patients who are worry-free and feel their health would be perfect.

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40. APPLYING VERBAL PROTOCOL ANALYSIS TO INVESTIGATE THE DECISION-MAKING STRATEGIES MEN USE WHEN CONSIDERING PROSTATE CANCER RISK FACTORS AND EARLY DETECTION SCREENING BEHAVIOUR: COMPARING MEN WITH AND WITHOUT A FAMILY HISTORY (DEC)

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Purpose: To investigate how heuristic and systematic information processing strategies are used to guide judgements about prostate cancer risk and prostate cancer screening decisions and to compare whether having a family history influences strategy use.

Method: First-degree relatives of men with prostate cancer (n=32) and men without a family history of prostate cancer (n=50) from Queensland, Australia completed a verbal protocol analysis interview. Participants responded to questions about what they had considered when deciding whether or not to participate in prostate cancer screening and when considering their prostate cancer risk. Responses were coded according to the use of the representativeness, availability, and affect heuristics and in terms of systematic strategies (e.g., information seeking, consideration of risk factors, screening recommendations).

Result: Men with a family history of prostate cancer used a greater total number of heuristic strategies on average than did men without a family history. Men with a family history were more likely to use positive instances of the availability heuristic when discussing prostate cancer risk and screening decisions than were men without a family history. Men with a family history were also more likely to make use of negative affect to guide judgements about their personal risk of prostate cancer. Few men used systematic processing strategies or mentioned any of the risks, benefits or uncertainties associated with early detection screening for prostate cancer.

Conclusion: Although men with a family history of prostate cancer tend to use heuristic strategies more frequently than do men without a family history, the types of heuristic strategies used by all men were largely the same. These findings suggest that the ways in which men may differ in terms of their processing of cancer-related information relates to how they integrate information within their existing knowledge structures.

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41. THE COMPLEXITY AND MULTIDIMENSIONALITY OF HEALTH RISK PERCEPTION: DISTORTIONS AND DETERMINANTS OF RISK PERCEPTION FOR VASCULAR AND ONCOLOGICAL HEALTH RISKS AND RISK FACTORS IN GERMANY (DEC)

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Purpose: High rates of mortality due to vascular and oncological diseases and concurrent increasing prevalence of modifiable risk factors (smoking, hypertension, diabetes mellitus type 2, hypercholesterolemia, overweight / obesity, physical inactivity, eating habits, alcohol consumption) call for better comprehension of

health risk perception. The purpose of this study was to explore distortions between objective and subjective risk and to identify the underlying determinants.

Method: An online questionnaire was designed, measuring personal and general risk perception (1. intuitive risk perception: participants had to report the most important cause of death and risk factor, 2. risk ranking of various causes of death and risk factors), socio-demographic characteristics, health status, knowledge, lifestyle and personality. The objective general and personal mortality risk and population attributable risk rates were eruated from data of the German Federal Office of Statistics and calculated with individual data based on Framingham general CVD algorithm. Respondents were categorized into age and (low, moderate, high) risk groups. Thus, deviations between actual and perceived risk of major death causes and risk factors were compared age- and risk-specifically, providing a multifaceted analysis of health risk perception and its determinants.

Result: Overall, as to intuitional perception, mortality risk of traffic accidents was overestimated as were genetic predisposition and familial history, whereas vascular incidents were underestimated, but correctly ranked in the second part. The reasons given were uncontrollability, dreadfulness, exposure, experience, and probability. A significant deviation between objective and subjective risk was present in the age group from 40 upwards regarding cerebro- and cardiovascular causes of death. Though hypertension was correctly ranked, knowledge and ranking of modifiable lifestyle-related risk factors were deficitary. The phenomenon of optimistic bias was observed in all age groups. Best performance was present among people with either experience, exposure to severe diseases or risk factors, longtime healthy lifestyle, or elevated health knowledge.

Conclusion: A synopsis indicates that risk perception is a very complex and multidimensional construct which is influenced by various determinants to be addressed in everyday practice of general practitioners and internists dealing with target age groups. We suggest the importance of integrating individual-specific risk concepts and personalized approaches into primary prevention in order to increase accuracy of risk perception and contribute to effective health promotion, and further research on modifying and improving health perception.

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42. HPV VACCINATION YES OR NO: A QUESTIONNAIRE STUDY AMONG PARENTS ON DETERMINANTS OF INTENTIONS (DEC)

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Purpose: To assess determinants of parental intention, prior to their decision about their daughter's uptake of Human Papillomavirus (HPV) vaccination.

Method: In June 2009 self-administered questionnaires were spread among 5918 parents with a 10 to 11-year-old daughter, assessing their uptake intention; knowledge about HPV vaccination; attitudes toward vaccination; and other determinants. Knowledge scores ranged from 0-18, with scores of ≥ 10 indicating sufficient decision-relevant knowledge. Rates of informed intention were measured, i.e. an intention that is in line with attitudes and based on sufficient HPV decision-relevant knowledge. An ordinal logistic regression model was used to determine predictors of intended HPV uptake. An interaction between attitude and knowledge was included in the model.

Result: The response rate was 29.8% (1762/5918). Multivariate analyses showed that a higher intention was determined by trust in the HPV vaccine (OR 2.03; 95%CI: 1.64-2.51), anticipated regret in case of no vaccination uptake (OR 1.68; 95%CI: 1.49-1.89), trust in the National Immunization Program (NIP) (OR 1.26; 95%CI: 1.01-1.57), and the belief that according to significant others their daughter should be vaccinated, and the motivation to comply to that (OR 1.05; 95%CI: 1.04-1.08). Higher perceived parental responsibility for their daughter's health was related to a lower uptake intention (OR 0.60; 95%CI: 0.45-0.82). There was a significant interaction between attitude and knowledge (OR 1.07; 95%CI 1.03-1.11), meaning that at higher knowledge levels the relation between attitude and intention was stronger. Demographic characteristics, perceived susceptibility of mother and daughter to contract cervical cancer and severity of cervical cancer were not associated with intention. Less than half of the respondents (48%) made an informed intention.

Conclusion: The present findings suggest that the relation between attitude and intention was stronger at higher knowledge levels. Increasing adequate HPV relevant knowledge may be vital to ensure attitude-consistent informed decision-making. Nevertheless, the present study also underscores the role of trust in the vaccine and NIP, and anticipated regret, thus affective feelings may play an even more prominent role in situations of uncertainly.

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43. HOW DO PATIENTS RESOLVE CONFLICTING MEDICATION RELATED INFORMATION? (DEC)

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Purpose: To determine the decision-making strategies patients use to resolve conflicting medication information.

Methods: Qualitative telephone interviews were conducted with 20 men and women with arthritis. Interview vignettes posed scenarios involving conflicting information from different sources (e.g., doctor, pharmacist, Internet). Respondents were asked how they would resolve the conflicting information. The 30-minute interviews were conducted over the telephone. Data analysis was guided by grounded theory. Emergent decision-making strategies were categorized using a dual process framework.

Results: Study respondents were 31-84 years old (mean age=55.5), predominantly female (n=13), and white (n=12). To resolve conflicting medication information, patients used System 1 (quick, effort-reductive) and System 2 (slow, deliberate, analytical) strategies. System 1 decisions included trial and error and three heuristics: the representative heuristic, the affect heuristic, and a process we named the "call-the-doctor heuristic." Trial and error was used more often in response to the first (primer) vignette, which involved no conflicting information, and the heuristics were used only to resolve conflicting information in the second, third and fourth vignettes. System 2 decision-making strategies included weighing benefits and risks, making trade-offs, and seeking more information, and were generally used less than System 1 processing. The most commonly used System 2 strategy was seeking more information, and trade-offs were observed when risks were highest and expert sources were involved in the conflict.

Conclusions: By identifying the scope of variability in how patients resolve conflicting medication information, our findings lay the groundwork for future studies aiming to: 1) quantify the use of decision-making strategies for resolving conflicting information, and 2) determine the effect of such strategies on health outcomes. In this study we found that patients resolved conflicting information using both effort-reductive and analytical strategies. Our findings suggest that patients' decisional strategies may be an area to target towards improving health behaviors such as medication adherence. For example, patients may benefit

from assistance from their provider in employing effortful, analytical System 2 strategies (e.g., weighing benefits against risks) when a health decision calls for careful deliberation. Alternatively, fostering the use of "good heuristics" (such as the call-the-doctor heuristic) and discouraging the use of less productive ones may be a useful for decision aids to help patients effectively and appropriately resolve conflicting medication information.

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44. DO PARENTS CONSIDER BENEFITS TO OTHERS WHEN DECIDING WHETHER TO IMMUNIZE THEIR CHILD? (DEC)

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Purpose: In a well-vaccinated population, herd immunity is an important benefit of childhood immunization. However, it is unknown if this concept influences parents' decisions to immunize their children. We sought to determine if the concept of "benefit to others" had been found in the existing literature to influence parents' or guardians' motivation for childhood immunization.

Method: We systematically searched Medline for articles on parental/guardian decision-making regarding child immunization. Two authors selected titles and abstracts to identify relevant articles to review in full. Three authors analyzed articles chosen for full review. Disagreement was resolved through discussion. Articles were included for analysis if they were original studies, elicited responses from parents/guardians of children <18 years old, and in any way addressed willingness to vaccinate children for the benefit of others. Non-English articles were excluded.

Result: The search yielded 5865 titles. Of these, 86 articles were identified for full review. Seven additional articles were found among the references cited by these articles. Eighteen studies met inclusion criteria. Eight of the included studies were qualitative in nature. Another eight studies assessed benefit to others as one among many factors involved in parents' decision to immunize their child. In the eight non-qualitative studies, anywhere from 1% to 60% of parents listed benefit to others as a reason to have their child immunized. Lastly, we found two studies where the importance of benefit to others was ranked relative to other motivating factors. In the first of these studies, benefit to others was reported as the primary motivating factor for childhood immunization by only 6% of respondents (Kilmartin et al., 1998). In the other study, it was ranked by 37% of respondents as the second most important factor, after preventing disease in one's own child (Wu et al., 2008).

Conclusion: In studies on parental decision-making regarding childhood immunization, benefit to others is rarely assessed as a motivating factor. There appears to be some parental willingness to immunize children for the benefit of others, but its relative importance as a motivator of vaccine uptake is largely unknown. Further work is needed to explore this concept as a possible motivational tool for increasing childhood immunization uptake.

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45. DEVELOPMENT OF A TOOL FOR IDENTIFICATION AND CLASSIFICATION OF DECISIONS IN MEDICAL ENCOUNTERS (DEC)

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Purpose: Despite increasing attention to the field of shared decision making, the medical literature provides little support and no tool to identify and classify decisions in patient-physician encounters. Addressing this void we are developing a typology to provide support in exploring links between the quality of clinical communication and medical decisions.

Method: A combination of qualitative methods has been used to study a selection of 130 available videotaped encounters from the Department of Internal Medicine in a Norwegian general hospital. The material from 7 subspecialities consist of 95 encounters from outpatient clinics, 25 from rounds and 10 from the emergency room. The initial use of grounded theoretical approach to identify and categorize clinical decisions has been supplemented by iterative group discussions with physicians and researchers in clinical communication.

Result: There are distinct differences in decision-making observed in the outpatient clinic, on rounds and in the emergency room. Dividing consultations into three phases; information gathering, problem defining, and management phase seems to be a feasible approach for all clinical situations. Decisions observed share properties resulting in possible subdivisions within each phase. Also decision-making relates to past, present and future tense differently and is observed as conveyance of past conclusions, revelation of present decisions and discussion concerning future needs and possible outcomes. All these deliberate acts of communication contribute to the process where the patient´s provided care and the physician´s application of skills are products. We find great variety in nature, complexity and importance of clinical decisions. As our aim is to establish associations between communication behaviour and quality of decisions it is evident that some decision types, e.g. drug-related, diagnostic, follow up decisions, are more relevant to assess than others. The classification system covering all kinds of decisions we have observed will be presented in detail.

Conclusion: We are developing a new tool that can be used to identify and classify medical decisions in clinical encounters. The typology opens up for a new mapping of the decision-making terrain and may be used in research on associations between different types of decisions, ambient communication and clinical outcomes.

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46. RACIAL/ETHNIC VARIATION IN THE INVOLVEMENT OF PARTNERS IN BREAST CANCER TREATMENT DECISION MAKING (DEC)

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Purpose: To describe involvement in treatment decision-making and unmet information needs of racially/ethnically diverse partners of breast cancer patients.

Methods: We surveyed 503 partners of breast cancer survivors who had responded to a population based survey being conducted in two metropolitan SEER registry sites. Partners were sent invitations and surveys via the patient, with a separate return envelope and a $10incentive. To date, 370 have returned surveys (RR=74%). Primary outcomes include partner reports of participation in treatment discussions (yes vs. no), perspectives regarding their involvement in treatment decisions (low vs. high), desire for more involvement (yes vs. no), decision regret (5 items), and their own information needs. Independent variables included race/ethnicity and age.

Results: 55% of partners were white, 30% Hispanic, 11% African American (AA) and 3% other. Most partners reported participating in treatment discussions (67% white, 56% Hispanic, 58% AA, P=.389), and

most (60%) wanted their wife/partner to have lumpectomy. Hispanic partners more often reported low involvement in treatment decisions (32% vs. 56% for white and AA, P=0.02), and desire for more involvement (50% vs. 18% for white and 42% for AA, P<0.001). Hispanic partners were 4 times as likely as whites to report high levels of decision regret (OR 4.3, 95% CI 2.2-8.7). Many reported not getting enough information about the long term effects of breast cancer on their partner (56%), the risk of breast cancer recurrence in their partner (60%), how to cope with their partners' cancer (57%) or managing their own fears about cancer returning (38%). Hispanic partners more frequently reported wanting these and other concerns addressed by doctors (60% vs. 31% for white, and 19% for AA, P<0.001).

Conclusions: Partners of patients with breast cancer are frequently involved in treatment decision-making and have treatment preferences. However, decision quality appears low and many partners desire more information and decision support, particularly among Hispanics. These results motivate interventions that incorporate partners more fully in treatment decision-making.

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47. USABILITY AND EFFICACY TESTING OF A SPANISH LANGUAGE COLORECTAL CANCER SCREENING DECISION AID IN LATINOS WITH LIMITED ENGLISH PROFICIENCY (DEC)

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Purpose: Limited English proficient (LEP) Latino populations have low rates of knowledge of and adherence to colorectal cancer (CRC) screening guidelines. Few interventions have attempted to provide LEP Latinos decision support for screening. This study evaluated a new Spanish-language CRC screening decision aid (DA) for usability and efficacy.

Method: The DA is a 14-minute, computer-based video developed based on prior studies and formative research among LEP Latinos. For usability testing, we assessed how participants cognitively processed and perceived the DA content using the Think-aloud method and Likert scales. We revised the DA based on usability testing and then conducted a separate one-group, pre/post efficacy trial in which the primary outcomes were changes in screening-related knowledge and intent. We also assessed screening self-efficacy, screening preferences, and scores on the Control Preferences (CPS) and Decisional Conflict (DCS) Scales.

Result: Participants (n=47 usability testing and efficacy trial combined): average age 56; female 51%; Mexican-born 57%; low-income (<$20,000/year) 75%; recruited from community (vs. clinic) population 47%. Usability testing (n=16): Most (94%) participants required assistance to navigate the DA prototype. However, they found the DA highly acceptable: nearly all completely understood (87%), trusted (100%), and agreed with (100%) it, and found it personally important (100%) and relevant (94%). Efficacy trial (n=31): Compared to baseline, the revised DA significantly increased participants' knowledge regarding: the availability of multiple screening tests (3% vs. 55%, p<.001); availability of an in-home test (16% vs. 84%, p<0.001); fecal occult blood test (FOBT) frequency (3% vs. 71%, p<.001); risk of complications for colonoscopy (3% vs. 68%, p<.001); need for driver after colonoscopy (29% vs. 74%, p<.001); and recommended screening age (55% vs. 84%, p=.01). Viewing the DA increased the proportion of participants with intent to obtain screening (65% vs. 90%, p=.02) and to discuss screening with a doctor (52% vs. 90%, p<.001). Screening preferences were: colonoscopy 52%, FOBT 45%, unsure 3%, and no screening 0%. We did not observe important increases in proportions with self-efficacy for obtaining screening (84% vs. 98%, p=.13) or preferences (CPS) for an active decision making role (65% vs. 77%, p=0.27). Post-DA decisional conflict was low [mean DCS=13.6/100; (SD 17)].

Conclusion: A Spanish-language CRC screening DA was highly acceptable to LEP Latinos. The revised version was efficacious in increasing screening-related knowledge and intent.

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48. DEVELOPMENT AND PRELIMINARY EVALUATION OF EMERGENCY MEDICAL ALLIANCE FOR TOTAL COODINATION IN HEALTHCARE (E-MATCH) TO RESOLVE MISMATCH BETWEEN PATIENTS NEEDS AND AVAILABLE RESOURCES (DEC)

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Background: When emergency medical technicians (EMT) in Japan make the initial call to hospitals to accept patients, they have difficulty identifying medical facilities that can provide appropriate care to match patient conditions. Such mismatches can be problematic and are a growing social problem, often resulting in the rejection of emergency patients from one hospital to another.

Purpose: To design, develop, and evaluate a decision support tool that resolves discrepancies between patient needs and available resources called "emergency Medical Alliance for Total Coordination in Healthcare (e-MATCH)," which runs on an iPad2 platform and promotes shared decision making between EMTs and medical facilities.

Method: A rule-based algorithm that integrates information on patient symptoms and signs, resource availability, and current status of each facility was implemented in e-MATCH. EMTs record relevant patient information at scene, which is then used for the algorithm and information sharing between EMTs and hospitals. We evaluated both the algorithm and human user interface design, as well as algorithm performance for patients in cardiac or respiratory arrest (CPA) transferred before or after algorithm implementation. Consecutive patients transferred from July 1 to July 31, 2010 (before implementation) and from January 31 to February 14, 2011 (after implementation) were analyzed to determine the proportion of patients accepted after a first call (1st time %) and after >4 calls (>4 %). Usability was also evaluated by Nielsen's usability heuristics. Evaluated items included consistency, visibility, match, minimalist, memory, feedback, flexibility, message, error, closure, undo, language, control, and document.

Result: There were 56 and 46 CPA patients before and after algorithm implementation, respectively. The 1st time % before and after implementation were 64.3% (36/56) and 73.9% (34/46) (n.s.), and the >4 % were 10.7% (6/56) and 8.7□ (4/46), respectively (n.s.). While no problems leading to serious errors were identified, negative feedback was received from EMTs and physicians with respect to consistency, message, and error.

Conclusion: The e-MATCH system demonstrated a potential to reduce mismatches between patient needs and available resources. We have been improving the human user interface to satisfy EMT needs at scene based on heuristic evaluation.

49. HOW COST-EFFECTIVENESS ACCEPTABILITY CURVES VARY WITH THE NUMBER OF TREATMENT STRATEGIES COMPARED AND WHY THIS COMPROMISES THEIR USEFULNESS (MET)

James O'Mahony, MA, *Erasmus University Medical Center, 3000 CA Rotterdam, Netherlands and Joost van Rosmalen, PhD, Erasmus MC, University Medical Center, Rotterdam, Netherlands*

Purpose: To show that cost-effectiveness acceptability curves (CEACs) are contingent on the number of alternative treatment strategies compared and explain how this compromises their use as an objective measure of uncertainty in cost-effectiveness analysis (CEA).

Methods: CEAs typically compare a finite number of treatment alternatives. However, in many cases the actual number of treatment alternatives is very large or infinite. In such cases the cost-effectiveness frontier is not composed of a discrete number of points in the cost-effectiveness plane, but can be continuous. We use the example of a hypothetical intervention with a continuous dose-response relationship to show how increasing the number of treatment alternatives compared influences the shape of CEACs. How these curves change depends on the correlation of uncertainty between treatment alternatives in the probabilistic sensitivity analysis used to derive the CEACs. We compare the cases of perfect and zero correlation and an intermediate case, in which the correlation between alternatives increases with their proximity in the cost-effectiveness plane.

Results: In the case of zero correlation, increasing the number of treatment alternatives causes the CEACs to fall towards a probability of zero (Figures 1 & 2). With perfect correlation, the curves lie at probability of zero and jump to a probability of one over the range of the cost-effectiveness threshold where the given intervention has the highest net benefit. As the number of alternatives included grows large, the portion of the CEAC lying at probability of one converges to a single spike. In the intermediate case, the CEACs may initially lie at probability of zero or one, as in the case of perfect correlation, but eventually fall towards zero as the number of alternatives grows large (Figures 3 & 4).

Conclusions: This analysis shows that CEACs are contingent on the number of treatment alternatives compared. Without an objective basis to choose the number alternatives or the increments between them, the resulting CEACs seem arbitrary in part. Consequently, the usefulness of CEACs as an objective measure of uncertainty is questionable when many treatment alternatives are possible.

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50. EXPERT ELICITATION TO POPULATE EARLY HEALTH ECONOMIC MODELS OF MEDICAL DIAGNOSTIC DEVICES IN DEVELOPMENT (MET)

Wieke Haakma, BSc[1], Laura Bojke, PhD, MSc, BA[2], Lotte Steuten, PhD[3] and Maarten J. IJzerman, PhD[1], (1)University of Twente, Enschede, Netherlands, (2)University of York, York, United Kingdom, (3)University of Twente, AE Enschede, Netherlands

Purpose: During the development of new diagnostic and therapeutic devices, it is desirable to indicate the cost-effectiveness through modeling and to establish its potential clinical value to guide further developments. However, in these early stages of development, there are usually no or limited clinical data available. Instead elicitation methods involving experts can be used to obtain estimates on uncertain model inputs. In this study, expert elicitation was used as a method to estimate uncertain priors of the diagnostic performance of a new imaging technology, i.e. Photo Acoustic Mammography (PAM). We compared PAM as an alternative to MRI in the detection of breast cancer. Experts are asked to predict the sensitivity and specificity of PAM.

Method: Expert elicitation was used as a method to formulate the knowledge and beliefs of experts about the future performance of PAM and to quantify this information into probability distributions. Using the mathematical approach to elicitation, 13 experts (radiologists specialized in examining MR-images of breasts) estimated the true positive rate (TPR) and true negative rate (TNR) based on existing MRI data (with a TPR of 263 out of 292, and a TNR of 214 out of 308) and specified the mode (the most likely value), the lower, and the upper boundaries (a 95% credible interval). An overall probability density function (PDF) was determined using the linear opinion pooling method in which weighting is applied to reflect the performance of individual experts.

Result: The overall PDF indicated a sensitivity ranging from 56.1% to 86.9%, with a mode of 73.3%. The specificity ranges from 48.1% to 78.2%, with a mode of 64.7%. Experts expressed difficulties making the estimations, as there is not sufficient data about the manner in which PAM visualizes different tumor types.

Conclusion: Using expert elicitation in the absence of clinical data, priors distribution of the range of sensitivity and specificity could be obtained. Theoretically, this data can be fed into early health economic models. However, experts have difficulties estimating the performance based on limited data. Therefore, large clinical trials with PAM should indicate whether these results are valid and expert elicitation could be used in early technology assessment. Before that, the use of the elicited priors in health economic models requires careful consideration.

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51. THE VALUE OF MARKERS IN PREDICTION MODELS: NET BENEFIT AND TEST HARM RATHER THAN THE C-INDEX (MET)

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Purpose: Prediction models are popular in medicine, and many attempts are made to improve models with risk markers or new tests. We aimed to assess methods for the evaluation of the value of markers or tests in prediction models.

Method: Models are often compared using the difference in c-indexes (Δc), but the c-index does not reflect model performance in clinical practice where one decides about giving treatment or not. This decision can be directed by a prediction model using a sensible risk threshold C. One appealing approach to evaluate models within this framework is the net benefit (NB): $NB = (TP - wFP)/N$, with TP and FP the number of true and false positives, N the sample size and w the relative cost of false versus true positives. This weight can be conveniently derived from the risk threshold as the odds of C. Thus, NB corrects the proportion of true positives with a weighted proportion of false positives (Vickers, MDM 2006). A model with higher NB is clinically more useful at a given threshold C. However, if the difference in test harm (ΔTH) compensates the difference in NB (ΔNB), the model with lower NB may still be preferable. Since ΔNB is a number on the scale of TP/N, $1/\Delta NB$ gives the number of patients that one should be willing to trade for one extra true positive when using the model with highest NB (the *test threshold*). If fewer patients per extra true positive are acceptable, then the additional test harm of the superior model is too high.

Result: We compared two logistic regression models to diagnose malignancy of ovarian tumors, one with 12 predictors and another where 6 predictors are dropped. On a dataset of 2,757 patients, Δc was 0.015, ΔNB was 0.006 for a decision threshold $C=0.10$. The test threshold was 172 measurements of the extra predictors for one additional true positive.

Conclusion: Net benefit of a marker or test can meaningfully be expressed in the test threshold. This measure may aid in promoting utility-based evaluation of prediction models with additional measurements of markers or tests.

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52. COMPARISON OF VARIABLE SELECTION METHODS FOR THE GENERATION OF PARSIMONIOUS PREDICTION MODELS FOR USE IN CLINICAL PRACTICE (MET)

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Purpose: Risk prediction models that contain more than seven predictor variables may be less likely to be used in clinical practice. The purpose of this project was to compare five commonly used variable selection methods in their ability to create small, accurate risk prediction models of comparable size (<=7 variables).

Method: The five methods (forward stepwise regression, backwards stepwise regression, forward stepwise based on the c statistic, Harrell's stepdown, and random survival forest (RSF)) were compared head-to-head in four large cohorts using 100 random cross validations. All of the methods were used to select variables for use in a Cox regression in which continuous variables were fit using restricted cubic splines. RSF was also used to select variables for an RSF generated prediction. The cohorts ranged in size from 3,969 to 191,011 patients. Variables and interactions included in the "full" statistical models were determined by clinical experts for previous studies using these same datasets.

Result: Forward stepwise regression was at least as good as the other methods in 3 out of the 4 datasets (as determined by the median cross-validated c statistic), but there was little difference in the discrimination of the models produced by forward stepwise, backward stepwise, forward stepwise based on the c statistic, and Harrell's stepdown. RSF was the least stable method across the different datasets and while it produced the most accurate Cox model for one dataset, the RSF generated prediction was the least accurate in three of the datasets and had to be abandoned in the largest dataset due to excessive computation time. Histograms of the variable selection frequencies show that all of the methods were inconsistent in their selection of variables between each cross validation.

Conclusion: Forward stepwise regression appears to be a reasonable approach for creating prediction models when the number of variables in the model is limited to 7 in an effort to increase the use of the model in clinical care. These results may not pertain to larger statistical models with lower numbers of events per variable. RSF could become a more attractive approach as computational capabilities improve and if dataset characteristics can be identified that suggest RSF is more likely to produce a more accurate result.

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53. IMPROVING THE EFFICIENCY OF THE ANALYTIC HIERARCHY PROCESS (MET)

Christine M. Duffy, MD, MPH, Brown University, Providence, RI, Rahul Banerjee, BS, Brown Medical School, Providence, RI and James G. Dolan, MD, University of Rochester, Rochester, NY

Purpose: The Analytic Hierarchy Process (AHP) is a well-established multi-criteria decision making approach, which is ideal for use when decisions have no clear best alternative, and decisions are highly preference-based. AHP consists of identifying the goal of the decision, the alternatives available, and the criteria by which to evaluate the alternatives. However, the time needed to perform the pair-wise comparisons required in AHP can become onerous and is an important limitation of standard AHP. Wedley

(2009) has proposed a modified AHP using incomplete (imputed) comparisons. We sought to replicate and externally validate this approach.

Method: We created a web-based decision task using AHP in which subjects complete pair-wise comparisons of 5 shapes based on their area. Subjects were recruited via email from author contacts. In the modified AHP approach, users first rank the items. Using the lowest ranked item as referent, the first n-1 comparisons are generated to form an interconnected spanning tree. Missing priorities are solved as the eigenvector of an augmented matrix with the number of row missing values plus one in the diagonal. Once a subject reaches a satisfactory consistency ratio of <0.10 (CR=CI/RI where CI=(λmax-n)/(n-1), RI=random consistency index) participants are given the opportunity to stop the comparisons. Average priorities, number of comparisons completed, mean consistency ratio, mean absolute error and percent error were calculated.

Result: 40 subjects participated. Thirty-three percent were male, 42% were white and 58% were from racial/ethnic minorities. Twenty percent had less than a college education. The average number of comparisons was 8.5 (range 7-10), a reduction of 1.5 comparisons for each criteria. The mean consistency ratio was 0.015 ± 0.002, mean absolute error in priorities was 0.018 ± 0.016 and the mean absolute percent error $9.7 \pm 4.2\%$.

Conclusion: We have externally validated Wedley's modified approach, achieving improved efficiency while maintaining accuracy. Although the reduction in comparisons was modest, for decisions with many criteria and alternatives, this reduction is significant. When developing decision aids for complex decisions that incorporate AHP, the modified approach should be considered as it can reduce subject burden and improve usability.

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54. TRANSPLANT CENSORING AND THE NATURAL HISTORY OF MELD VIA EM ESTIMATION (MET)

Gordon B. Hazen, PhD, Northwestern University, Evanston, IL, Zhe Li, Northwestern Univ, Evanston, IL and Anton Skaro, M.D., Northwestern University, Feinberg School of Medicine, Chicago, IL

Purpose: To obtain natural history estimates for disease progression on the U.S. liver transplant wait list

Method: The U.S. liver transplant wait list is prioritized by MELD, a combination of laboratory values positively correlated with 90-day mortality. The U.S. Scientific Registry for Transplant Recipients publishes 30-day MELD transition data appropriate for Markov modeling. However, this data cannot be regarded as natural history, as transplant interrupts MELD transitions. Moreover, the data shows some MELDs more likely to improve than worsen, odd because listed candidates should on average expect worsening MELDs. We hypothesize this is due to censoring by transplant, and fit a statistical model that allows this using the EM algorithm.

Results: The fitted model confirms transplant censoring (Figure 1) and produces estimates of the natural history of MELD without transplant that differ from naïve estimates in important ways (Figure 2). Transplant censoring also implies that policy changes that increase transplant rates would improve untransplanted progression, and the fitted model provides an estimate of this effect (Figure 3).

MELD	Naïve Est. Prob that MELD Worsens	Improves	Est. Natural History Prob that MELD Worsens	Improves
31+	0.61	0.18	0.62	0.17
21-30	0.14	0.20	0.13	0.20
15-20	0.07	0.10	0.09	0.10
11-14	0.08	0.05	0.09	0.06
<11	0.06		0.06	

Figure 1
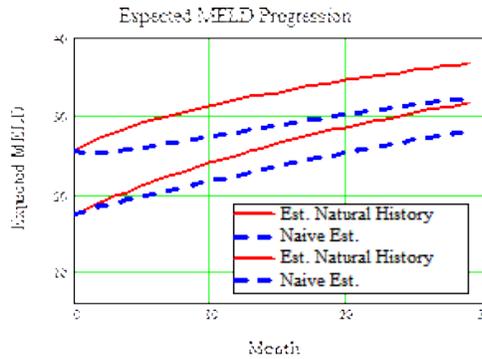
Figure 2
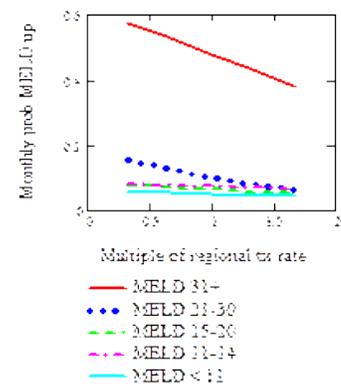
Figure 3

Conclusion: Estimating transplant censoring is potentially important. A policy change that increases transplant rates would increase censoring of worsening MELD transitions, resulting in an improvement in untransplanted progression. In this case it would not be accurate to use naive estimates of untransplanted progression. Similarly, if we are modeling a specific region of the U.S. where transplant rates are higher (lower) than the national level, then untransplanted progression would be better (worse) than the national estimates, and naïve national estimates would be misleading. By accounting for transplant censoring, our natural history estimates avoid these pitfalls.

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55. USE OF RICHARDSON'S EXTRAPOLATION TO REDUCE TIMING ERRORS IN MARKOV MODELS (MET)

Pelham M. Barton, PhD, *University of Birmingham, Birmingham, United Kingdom*

Purpose: To explore the possibility of using Richardson's extrapolation in Markov models.

Method: For computational efficiency, it is desirable to use as large a cycle length as possible in a Markov model. However, large cycle lengths incur the risk of timing errors. Methods such as half-cycle correction and Simpson's rule can account for timing errors in calculating total costs and outcomes from Markov models, under the assumption that the state probabilities have been calculated correctly. However, it is also possible that timing errors may have been made in estimating the transition probabilities. Particular cases where there is scope for such errors are the presence of competing risks and the possibility of more than one event happening within a cycle, in particular for a progressive disease where some individuals may progress by more than one stage within a cycle. In principle these problems can be addressed by careful calculation of the probabilities: an alternative approach is called Richardson's extrapolation, in which the model is constructed and run using two or more different cycle lengths. Comparing the results from different cycle lengths allows an estimate of the timing errors to be made and hence an estimate of the results without timing errors. It is also possible to apply Richardson's extrapolation to appropriate powers of the transition matrices for models of different time cycles: the resulting transition matrix can then be used. Models have been built based on two different underlying continuous time models. The following two methods have been used for each model: (1) deriving transition probabilties directly from the continuous time models; (2) using simulated data sets sampled from the continuous time models. Richardson's extrapolation has been applied to each of these four cases, at both the results stage and the transition matrix stage.

Result: In all cases considered, Richardson's extrapolation gives an improvement in efficiency without any loss of accuracy in the model results.

Conclusion: Richardson's extrapolation is a promising approach for improving the efficiency of work with Markov models.

56. COMPARATIVE EFFECTIVENESS RESEARCH TO AID DECISION MAKING: RELATING CLINICAL OUTCOMES AND QUALITY ADJUSTED LIFE YEARS (MET)

Jonathan D. Campbell, PhD, University of Colorado School of Pharmacy, Aurora, CO, Louis P. Garrison, Ph.D, University of Washington, Seattle, WA, Judy Zerzan, MD, MPH, Colorado Department of Health Care Policy and Financing, Denver, CO and Anne Libby, PhD, University of Colorado, Aurora, CO

Purpose: Comparative effectiveness research (CER) aims to assist patient and population-level decision making in order to improve health care. A gap exists in terms of using a standardized approach to quantitatively weigh interventions with respect to their collective clinical harms and benefits. We present a CER framework for decision makers to integrate clinical evidence by assigning numerical weights to intervention-specific clinical harms, benefits, and uncertainty.

Methods: Building on decision-analytic modeling, we propose a two step approach to CER that explicitly compares interventions in terms of clinical harms and benefits evidence and links this evidence to the quality-adjusted life year (QALY). The first step is a traditional evidence synthesis of intervention-specific harms and benefits. Conflict and subjective judgment may arise in determining which intervention is optimal if one intervention exhibits superior outcomes but the alternative intervention exhibits other superior outcomes. The second step is pursued when clinical equipoise exists. The second step is the development of a decision-analytic model to simulate the population and the progression of disease over an appropriate time horizon. The output of the two steps is the ability to compare and quantitatively link clinical harms and benefits with QALYs. We craft a hypothetical asthma example (intervention A1 vs. A2).

Results: Hypothetical intervention A1 yields better asthma control and trends toward lower severe exacerbation rates with no known difference in mortality. A2 trends toward lower mild exacerbation rates and has higher lung function scores as well as lower dyspnea. All clinical harms and benefits are linked to QALYs based on a validated asthma decision-analytic model. A1 is associated with 0.25 additional average lifetime QALYs compared to A2 with 95% interval of (-0.05, 0.55).

Conclusions: Using decision-analytic models and QALYs in the CER decision-making process gives an explicit, structured, and consistent quantitative approach to weighing all relevant harms and benefits. The use of decision-analytic models in CER may not be the current standard due to the misconception that decision-analytic methods must include cost, because clinical harms and benefits are not commonly displayed as outputs or related to QALYs in cost-effectiveness models, and/or due to fears related to the use of QALYs as an outcome measure. Future research should study effective communication of these added dimensions for payer, research, and clinical stakeholders.

57. ENTROPY-BASED EXPECTED UNCERTAINTY REDUCTION TO GUIDE THE CLINICAL EXAM (MET)

Robert M. Hamm, PhD, University of Oklahoma Health Sciences Center, Oklahoma City, OK and William H. Beasley IV, PhD, Howard Live Oak, Inc., Norman, OK

Purpose: The ability to anticipate the impact of potential clinical findings in discriminating among possible causes of a patient's presenting complaint is an essential component of clinical judgment. We applied an

information theory based measure (Benish, Meth Inf Med, 2003), based on both test sensitivity and disease probability, and compared it with familiar sensitivity-based measures (LR+, LR-, and the LR ratio).

Method: The approach considers all diagnoses relevant for a clinical presentation, with sensitivities of all findings for all the diagnoses. Without "specificity," it avoids the problem of "dynamic specificity." Entropy, or Sum $p(D_i)*\log(1/p(D_i))$, expresses the uncertainty regarding the current probability distribution over diagnoses D_i. We construct a tree whose first branch is a particular finding's results (positive, negative) with probabilities composed of each $p(D_i)$ multiplied by the finding's sensitivity for that diagnosis. After each branch there is an entropy tree, with the diagnoses' probabilities contingent on the finding result, e.g., Sum $p(D_i | F+) * \log (1/p(D_i | F+))$. This expected entropy uncertainty is compared to the pre-finding uncertainty, yielding an expected reduction in entropy uncertainty (ERIEU). Comparisons are made between the ERIEU and the sensitivity based measures. Further, this approach was added to a balance beam aid for instruction in diagnosis (BBAID), to calculate ERIEU dynamically as other information is learned.

Result: For a pair of diagnoses, there is a large family of entropy based measures, different for every pretest odds of the two diagnoses, compared to the 5 diagnosis-probability-independent sensitivity-based measures. As the number of diagnosis pairs N increases, the count of measures increases by a factor of $N*(N-1)/2$. The BBAID calculates ERIEU dynamically, for all unknown findings, as the probability distribution changes (when additional findings are specified), and displays it for all unknown symptoms, for any selected diagnosis pair.

Conclusion: The information-theory based measure, ERIEU, is distinct from the measures derivable from sensitivity alone. It changes dynamically as other information is acquired that changes the probability distribution among the diagnoses. Though this is too complicated to judge unaided or to calculate manually, we have added it to a diagnosis aid that represents the (naïve) Bayesian impact of information, for any pair of diagnoses. The display of ERIEU for each finding not yet asked for can guide physician's selection of useful questions.

Monday, October 24, 2011 (Posters)

SMDM POSTER SESSION 3

3:00 PM - 4:30 PM: Mon. Oct 24, 2011
Grand Ballroom AB (Hyatt Regency Chicago)

Session Summary:

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1. THE OPTIMAL TIME TO PREPARE A FISTULA FOR HEMODIALYSIS PATIENTS

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2. IMPROVING PAIN ASSESSMENT IN CLINICAL PRACTICE

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3. WITHDRAWN - ATTITUDES TOWARDS EUTHANASIA INFLUENCES VALUES ELICITED WITH THE TTO METHOD

4. A GUIDING FRAMEWORK FOR THE EVALUATION OF VALUES CLARIFICATION EXERCISES

5. PSYCHIATRIC PATIENTS' ATTITUDES TOWARDS SHARED DECISION MAKING

6. IS THERE LESS SHARED DECISION MAKING WHEN THE PROVIDER MAKES A RECOMMENDATION?

7. INTEGRATING QUANTITATIVE PREFERENCE-RELATED EVIDENCE INTO HEALTH TECHNOLOGY ASSESSMENT: THE CASE OF VENTILATION FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

8. MINORITY CANCER SURVIVORS' PERCEPTIONS AND EXPERIENCE WITH CANCER CLINICAL TRIALS PARTICIPATION

9. CAN HEALTH COACHING HELP PATIENTS WITH SPINAL STENOSIS MAKE AN INFORMED TREATMENT CHOICE?

10. ATTITUDES TOWARD PRENATAL TESTING AND PREGNANCY TERMINATION AMONG A DIVERSE POPULATION OF PARENTS OF CHILDREN WITH INTELLECTUAL DISABILITIES

11. ASSESSING WOMEN'S SOURCES OF CHILDBIRTH INFORMATION: ARE THEY ADEQUATELY INFORMED ABOUT INDUCTION OF LABOR AND CESAREAN DELIVERY?

12. TRAINING HEALTH PROFESSIONALS IN SHARED DECISION MAKING: AN INTERNATIONAL ENVIRONMENTAL SCAN

13. COMPARISON OF PREFERENCE ASSESSMENT METHODS BASED ON PROSTATE CANCER PATIENT CHARACTERISTICS

14. PILOT SURVEY OF PHYSICAN PREFERENCES FOR TEST THRESHOLDS FOR PEDIATRIC NEUROIMAGING GUIDELINES

59. OB-GYNS' KNOWLEDGE AND OPINIONS ABOUT THE USPSTF 2009 BREAST CANCER SCREENING GUIDELINES AND NUMBER NEEDED TO TREAT FOR MAMMOGRAPHY SCREENING

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60. OVERVIEW AND EVALUATION OF DECISION-ANALYTIC MODELS FOR THE TREATMENT OF CHRONIC MYELOID LEUKEMIA

Grand Ballroom AB (Hyatt Regency Chicago)

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1. THE OPTIMAL TIME TO PREPARE A FISTULA FOR HEMODIALYSIS PATIENTS (MET)

Steven M. Shechter, PhD, *Nadia Zalunardo, MD, SM, FRCP(C) and M. Reza Skandari, PhD Student, University of British Columbia, Vancouver, BC, Canada*

Purpose:

The gold standard for hemodialysis delivery is via an arteriovenous (AV) fistula. Two types of uncertainty make it difficult to know the optimal time to create a fistula: 1) when a CKD patient may need to start dialysis, and 2) when a fistula will mature. We developed a decision model to evaluate two key timing decisions: 1) when to request laboratory tests to estimate glomerular filtration rate (eGFR), and 2) when to start fistula preparation based on the results.

Methods:

Based on observed data, we assume eGFR declines linearly, and that observed values fluctuate around this line according to $y(t) = 45 - .375t + \varepsilon$, where $\varepsilon \sim N(0,4^2)$ and t is in months. We assume that patients start dialysis when their eGFR = 15 and that there is a Uniform[3,9] month distribution of time from when fistula preparation commences until it is ready for use. We assume the clinician obtains noisy eGFR readings upon each test, fits an updated linear regression, estimates when the line crosses 15, and then subtracts a "backtrack time" to factor in the various uncertainties (random observations and time for fistula to mature). If the resulting time has already passed or is imminent, fistula preparation commences; otherwise one waits until the next scheduled lab test.

We simulate the observation process and fistula maturation time via Monte Carlo simulation, and use it to evaluate expected costs associated with various lab testing and fistula start time policies. We consider three types of cost parameters: 1) c_L—cost per day fistula is ready later than ideal dialysis start time, 2) c_E—cost per day fistula is ready early, and 3) c_T—cost for each lab test patient undergoes.

Results:

Among fixed-spacing testing policies, simulation experiments suggest an optimal (inter-test time, backtrack time) of (3 months, 13 months). In sensitivity analyses, we changed the slope parameter to -.25 ("slower progressor") and -.5 ("faster progressor"), and obtained optimal solutions of (4 ,14) and (2 , 11), respectively. Results were not very sensitive to the distribution of fistula maturation time.

Conclusions:

Monte Carlo simulation is a useful tool for evaluating the interaction between testing frequencies and fistula initiation policies when establishing guidelines for dialysis preparation.

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2. IMPROVING PAIN ASSESSMENT IN CLINICAL PRACTICE (DEC)

Liana Fraenkel, MD, MPH, *VA CT Healthcare System; Yale School of Medicine, New Haven, CT, Paul R. Falzer, PhD, VA CT Healthcare System, West Haven, CT, Terri Fried, MD, Yale School of Medicine, West Haven, CO, Minna Kohler, Yale University, New Haven, CT, Robert Kerns, PhD, VA CT Healthcare System; Yale University School of Medicine, West Haven, CT, Ellen Peters, Ph.D., Decision Research, Eugene, OR and Howard Leventhal, PhD, Rutgers University, New Brunswick, NJ*

Purpose: Routine assessments of pain using an intensity numeric rating scale (NRS) have improved documentation, but have not improved clinical outcomes. Ideally, a screening tool meant to trigger additional treatment would accurately reflect the impact of pain on patients' current quality of life and correlate with patients' willingness to accept additional therapy. The objective of this study was to examine whether patients' illness perceptions more accurately reflect impact of pain and therefore better correlate with patient treatment preferences than the pain intensity NRS.

Methods: We interviewed outpatients with chronic, noncancer, musculoskeletal pain. Experience of pain was measured using 18 items drawn from Illness Perception Theory. The items were factor analyzed using the principal axis method. 38% of the variance was accounted for by a single factor that we labeled "impact of pain." We used general linear models to examine how NRS scores compare with impact of pain in predicting preferences for highly effective/high risk treatment.

Results: 249 (43%) of 575 eligible subjects agreed to participate. 206 could not be contacted, 120 refused. 75% were male; 71% Caucasian; mean age was 53.5 (±19.5). 183 (73.5%) subjects preferred a highly effective/high risk treatment for pain versus a mildly effective/no risk treatment for pain. The principal axis factor analysis generated 5 factors and accounted for 67.1% of the variance. 37.9% of the variance was accounted for by a single factor that we labeled "impact of pain." Pain intensity as measured by the NRS was not associated with subjects' preference for a more effective and riskier treatment for pain [1.20 (0.97-1.26), df=1]. However, pain impact was significant in both the unadjusted [1.43 (1.06-1.92), df=1] and adjusted models [1.38 (1.01-1.87, df=1].

Conclusions: While there are numerous possible reasons for our failure to improve processes of care and outcomes for patients with chronic pain (including limitations in physician training, patient-physician communication, and lack of effective therapies), implementation of valid measures is critical if quality of care continues to be judged against the results of screening assessments. The results of this study suggest that patients' illness perceptions related to the impact of pain are more informative than the NRS and therefore may be more likely to affect the care delivered to patients with chronic pain.

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3. WITHDRAWN - ATTITUDES TOWARDS EUTHANASIA INFLUENCES VALUES ELICITED WITH THE TTO METHOD (DEC)

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Purpose: The time trade-off (TTO) method is frequently used to elicit health state values in national valuation studies for the EQ-5D. TTO is used to identify the point of preferential equilibrium between a fixed number of years in an impaired EQ-5D health state and a shorter life in perfect health. Values are anchored at perfect health (1) and death (0). To allow health states considered worse than death (<0), the initial TTO question asks whether the target health state is better, worse, or equal to death. It is conceivable that respondents who are opposed to euthanasia display an aversion to describing health states as worse than death, resulting in elevated TTO scores. The aim of this study was to investigate whether respondent attitudes towards euthanasia affect health state values elicited using the regular TTO method, and the Lead-Time TTO (LT-TTO), where comparison to death is less direct.

Method: Each of 811 members of a survey panel representative of the Norwegian general population valued eight EQ-5D health states on a visual-analogue scale (VAS) and with the TTO method (n=328) or with the alternative LT-TTO (n=483). We assessed attitudes towards euthanasia (ATE) using three items (passive euthanasia, active euthanasia, and assisted suicide), resulting in values ranging from -2 (strongly against euthanasia) to 2 (strongly in favour). After exclusions due to inconsistencies and incomplete responses, 400 LT-TTO and 213 regular TTO respondents were included in analyses. We used multiple linear regressions to predict VAS, TTO and LT-TTO values by ATE, sex, age and education.

Results: For VAS values, the only statistically significant predictor was sex. For regular and Lead-Time TTO, the only significant predictor was ATE; a one point increase on the ATE scale was associated with a mean TTO value of -.109 (p<.001) and .075 (p<.001) for regular and LT-TTO, respectively.

Conclusions: In this study TTO values were associated with attitudes towards euthanasia, while VAS values were not. The effect was greater for regular TTO than LT-TTO, possibly because death is less salient in the LT-TTO than the regular method. The findings indicate that the TTO method measures attitude towards death rather than, or in addition to, preferences for the health states in question.

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4. A GUIDING FRAMEWORK FOR THE EVALUATION OF VALUES CLARIFICATION EXERCISES (DEC)

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Purpose: Making health care treatment decisions in accordance with patients' values is a fundamental component of high quality care, particularly in the domain of preference-sensitive care. "Values clarification exercises" are often incorporated into programs of decision support (e.g., decision aids) as a basis for patients to identify and express the attributes and options salient to their decision making process. While the Decisional Conflict Scale is often used to evaluate these exercises from a psychometric perspective, there are no established measures upon which to evaluate them from an operational perspective. **The purpose of this study is to develop a framework to guide the formal evaluation of the processes involved in values clarification exercises.**

Methods: We searched the literature for published work on the evaluation of values clarification exercises. We paid particular attention to work conducted in the field of preference elicitation and decision modeling, given that many values clarification exercises extend from this work. We were specifically interested in those studies that evaluated exercises in terms of their required actions or steps and the level of acceptability from the user's perspective. Abstracts were reviewed for relevance. Full articles were reviewed for outcomes of interest.

Results: Our search resulted in the identification of five primary domains: 1) comprehensibility – the level of difficulty required to perform the exercise; 2) numerical orientation – translation of information artifacts (quantitatively or qualitatively); 3) time – the length of time required to perform the exercise; 4) interaction – the acceptability of the level of tradeoff engagement; and, 5) response format – the representativeness of the response format. These domains served as the basis for our framework development. Questions relating to these domains are being designed as part of a formal instrument development.

Conclusion: A variety of values clarification exercises have been developed and incorporated into decision support programs. Comparing these exercises – separate from the decision support process – is an important aspect to better understanding their role in high quality patient decision making. Moreover, assessing the process of values clarification will lend greater insight into decisional conflict. The framework proposed in this study is an early step in rigorously measuring these processes and the systematic evaluation of values clarification exercises.

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5. PSYCHIATRIC PATIENTS' ATTITUDES TOWARDS SHARED DECISION MAKING (DEC)

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Purpose: To assess psychiatric outpatients' attitudes towards shared decision making in an outpatient psychiatric setting and how socio-demographic and clinical variables influence their preferences.

Method: A total of 435 consecutive psychiatric outpatients attended in Community Mental Health Centres of the Canary Islands Health Service expressed along first trimester of 2010 preferences ranging from patient-directed to physician-directed styles on each of three aspects of decision making (seeking information, discussing options, making the final decision). A lineal regression analysis was made to assess relationships between sociodemographic variables (gender, age and education) and the expressed preferences.

Result: The 435 patients who agreed to participate in the study had a mean age of 42.8±11.8 years (range, 18–84) and 65% were female. Concerning educational level the 9.7% had no formal education, 44.8% had completed primary studies, 31.5% had completed secondary studies and 14% had a university degree.   For the 328 patients with data about current medications, the mean number of psychotropic drugs used was 2.7±1.2 (range 0–6). The 18.8% of the patients were under monotherapy treatment, whereas 26.2% received two drugs, 32.9% received three, and 21.8% received four or more drugs.   Concerning the psychiatric patients' preferences for participation in decision making, the great majority of patients (90.4%) preferred to be offered choices and to be asked their opinions. In contrast, 76.1% preferred to leave final decisions to their psychiatrists and 73.9% preferred to rely on physicians for medical knowledge rather than seeking out information themselves. Older patients tended to prefer rely on physicians' knowledge, while being women was associated to the preference of being offered choices. No significant predictors of preference to leave final decisions to psychiatrists were obtained.

Conclusion: Psychiatric outpatients vary substantially in their preferences for participation in decision making process. Psychiatrists should not assume that patients wish to participate in clinical decision making, but must assess individual patient preferences and tailor care accordingly. Age and gender significantly predicts different aspects of preference for shared decision making.

6. IS THERE LESS SHARED DECISION MAKING WHEN THE PROVIDER MAKES A RECOMMENDATION? (DEC)

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Purpose: Shared decision making requires a balanced presentation of treatment options, the benefits and risks of those options, and a discussion of patients' preferences. However, when a provider makes a treatment recommendation, he or she may not give a balanced presentation of treatment options and may not seek the patient's input. Here, we compare patient reports of involvement in breast cancer surgery interactions when surgeons make a recommendation and when they do not.

Method: Women with early stage breast cancer eligible for mastectomy and lumpectomy were surveyed. Patients reported whether the provider made a recommendation and if so what it was, and completed seven items about their interaction including (1) discussion of options (2) discussion of pros (3) discussion of cons, and (4) discussion of patients' treatment preference. The interaction items were summed and scaled to a total involvement score (0-100%) with higher scores indicating more shared decision making. Our hypothesis was that when providers made a recommendation, they would be less likely to have balanced discussion or ask for patients' preferences, and patients would report lower total involvement scores. We also examined individual items to determine whether there were differences in the specific aspects of the interaction.

Result: 440 patients completed the survey. Patients were on average 57 years old, white (83%), and the majority had a lumpectomy (62%). Most patients (85%) reported that their doctor made a recommendation for surgery. The recommendations were mainly for lumpectomy and radiation (62%) followed by mastectomy (27%). The total involvement scores were similar for those who received a treatment recommendation (60%) and those who did not (63%) (p=0.08). Providers who did not make a recommendation were more likely to mention mastectomy as an option (80% vs. 66%, p=0.02) and were more likely to ask patients for their preferences (66% vs. 45%, p=0.01). There were no significant differences in discussion of lumpectomy or pros and cons of the options.

Conclusion: Contrary to our hypotheses, the overall level of involvement was fairly similar when providers made a recommendation and when they did not. However, some behaviors did vary, as providers who did not make a recommendation were more likely to mention both treatment options and to ask patients for their preferences

7. INTEGRATING QUANTITATIVE PREFERENCE-RELATED EVIDENCE INTO HEALTH TECHNOLOGY ASSESSMENT: THE CASE OF VENTILATION FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE (DEC)

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Purpose: Recently, there has been increased effort to formally consider patient values and preferences in health technology assessment (HTA). Incorporating systematic reviews on patient preferences is one way of achieving this goal. To explore the feasibility of such an approach, we conducted a systematic review of patient preferences for ventilation among patients with chronic obstructive pulmonary disease (COPD).

Method: We searched MEDLINE, Cumulative Index to Nursing and Allied Health Literature, The Cochrane Collaboration, American Economic Association's electronic bibliography, EMBASE, Health Economic Evaluations, and PsycINFO databases for preference-relevant human studies published in English from 1990 through November, 2010. Selection criteria for the studies were: (i) study participants met criteria for COPD; (ii) at least one of the study interventions included invasive and/or non-invasive ventilation for the treatment of COPD; (iii) patient preferences were reported; and (iv) the study was not qualitative. Studies were selected based on title and abstract. Two authors independently extracted data using a standardized extraction table. Disagreement was resolved by discussion or consensus with a third party.

Result: Among 1833 identified citations, 12 studies were eligible for inclusion. 11/12 studies interviewed patients once; most studies elicited a stated preference for one or more types of ventilation. 58-77% of COPD patients indicated that they would try mechanical ventilation (MV). Studies that asked COPD patients about indefinite MV found that 60-78% would reject the intervention. Two studies that provided more information to patients by giving them in-depth decision aids found that only a minority were willing to accept MV.   Preferences for MV were not consistently associated with age, gender, pulmonary function, the presence of co-morbid conditions, or current quality of life. However, most COPD patients would forgo MV in the event that they were seriously incapacitated, such as being bedbound, or suffering from dementia.

Conclusion: Searching for and abstracting data from studies of patient preferences is feasible, and offers substantial insights beyond conventional evidence reviews and cost effectiveness analysis in HTAs. However, the process is difficult because of the heterogeneity of study designs, outcome measures, and terminology. Further development is required before preference reviews can become a routine part of HTA.

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8. MINORITY CANCER SURVIVORS' PERCEPTIONS AND EXPERIENCE WITH CANCER CLINICAL TRIALS PARTICIPATION (DEC)

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Purpose: To ascertain the experiences and perceptions of participation in cancer clinical trials by Hispanic and Black cancer survivors.

Methods: As part of a larger study to develop a decision aid for participation in cancer clinical trials, we conducted semi-structured interviews with English-speaking Hispanic (15), Spanish-speaking Hispanic (15), and Black (15) cancer survivors. We employed quantitative content analysis to code responses to 16 specific questions based on transcripts from the interviews. These questions included: whether the participant had been asked to be in a clinical trial or discussed it with a health care provider; if they would be willing to participate in a clinical trial in the future, and if it would be helpful to hear the experiences of others, particularly of their own race/ethnicity, about participating in a clinical trial.

Results: The average age of participants was 56.0 (SD 10.6) years; 93.3% were female, with most having had breast cancer (66.7%). Years since diagnosis ranged from 1-16, with an average of 3.3 (SD 3.0). Only 4 had been asked to participate in a clinical trial, and of these, 3 had joined a trial. Although only 4 had talked with a provider about participating, 23 (54.8%) wished that such a conversation had happened. In addition, 32 (71.1%) said that they would be willing to participate in a trial, and another 8 (17.8%) said that they may be willing. Almost all, 97.8%, said that it would be helpful to hear other cancer patients' experiences with clinical trials. However, most (81.8%) stated that it would not make any difference if the people relaying the

experiences were of the participant's own race/ethnicity. Rather, information from someone with their own type of cancer was viewed as more important by 36%.

Conclusions: Although few participants had even talked about clinical trials with their health care providers, most cancer survivors expressed willingness to participate and thought that hearing the experiences of others would be valuable. These findings highlight the need for physicians to discuss trials with patients, and for patients to raise the topic of clinical trials with their physician. Increasing cancer patients' knowledge and self-efficacy to discuss clinical trials with healthcare providers, for example through a decision aid, may lead to a much needed increase in participation rates.

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9. CAN HEALTH COACHING HELP PATIENTS WITH SPINAL STENOSIS MAKE AN INFORMED TREATMENT CHOICE? (DEC)

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Purpose: Treatment options for lumbar spinal stenosis (SS) include surgical and non-surgical approaches. Decision support coaching develops patients' skills in preparing for a consultation and deliberating about their options. The goal of this study is to assess the impact of telephone coaching on knowledge and decisional conflict for patients considering their treatment options for SS.

Method: Patients with SS are referred by a spine specialist for decision support and are randomly assigned to either: decision aid (DA, usual care) or decision aid + telephone health coaching (DA+HC, intervention group). Coaching time has varied from 15-60 minutes. Participants complete questionnaires at: baseline, after watching the video DA, 2 week follow up, and at 6 months. Measures: Patient demographics (e.g., age, gender, and education); Understanding of SS treatment options based on a 3-time multiple choice test; decisional conflict scale (DCS); and coaching status.

Result: To date, 68 patients have enrolled (32 DA only / 36 DA+HC). 26 DA only and 27 DA + HC have completed surveys through the 2 week follow-up. Average age 64.2, 57% female, 61% had at least some college. Both groups showed improved understanding of spinal stenosis treatments after watching the DA (paired t-test, $p < 0.001$). DA only patients showed a decrease in knowledge scores over time (after DA 78% vs. follow up 57%, $p=0.008$); while coaching patients tended to retain their knowledge of key facts surrounding the decision (after DA 61% vs. follow up 62%). Patients showed improvements in decisional conflict after watching the DA (paired t-test, $p \leq 0.01$); at two weeks, patients who received coaching showed an additional small improvement in decisional conflict (DCS=17 vs. DCS=9, $p = 0.07$).

Mean score (95% clm)	DA only (n=26)			DA+HC (n=27)		
	Baseline	After DA	Follow up	Baseline	After DA	Follow up
Knowledge (% correct)	26% (18-34)	78% (71-84)	57% (45-69)	25% (18-32)	61% (50-72)	62% (51-73)
Decisional conflict	39 (29-49)	15 (8-21)	15 (8-22)	31 (22-40)	17 (7-27)	9 (3-16)

Conclusion: The preliminary results from this ongoing study suggest that the DA intervention improved understanding of key facts and helped these patients by reducing decisional conflict about their treatment choice. Whether the addition of health coaching improves decision making for SS patients who receive a decision aid remains to be seen.

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10. ATTITUDES TOWARD PRENATAL TESTING AND PREGNANCY TERMINATION AMONG A DIVERSE POPULATION OF PARENTS OF CHILDREN WITH INTELLECTUAL DISABILITIES (DEC)

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Purpose: To assess how parents of children with intellectual disabilities view prenatal testing and pregnancy termination for their child's condition and identify correlates of these views.

Method: English- or Spanish-speaking parents of intellectually disabled children aged 2-10 years who were clients of a regional center or patients at an academic genetics clinic participated in a telephone interview. Among other items, they rated their agreement with two statements: "If I were to get pregnant, I would have a prenatal test to see if my baby will be born with [their child's condition]" and "If I were to get pregnant and found out that my baby will be born with [that condition] I would choose to terminate the pregnancy." Multivariate regression analysis was used to identify predictors of agreement with these statements.

Result: 57% of the 201 participants were Latina, 27% were white, 9% were Asian and 5% were African American. 37% did not attend college and 26% had household incomes of <$25,000. The mean age of the affected child was 6.4 years; 47% had autism. While 81% of the participants agreed that pregnant women should have the option of testing for their child's condition, only 61% felt they would have prenatal testing. And although half (51%) agreed that pregnant women should be allowed to terminate their pregnancy for this condition, only 17.9% agreed that they would opt for termination in this context. Multivariable logistic regression yielded Asian race/ethnicity (adjusted OR (aOR) 7.77, 95% CI 1.33-45.46; aOR 5.72, 95% CI 1.19-27.57) and endorsing the option of termination for the condition (aOR 4.80, 95% CI 2.07-11.12; aOR 13.77, 95% CI 3.51-53.93) as independent predictors of prenatal testing and termination inclinations respectively. Latinos (aOR 4.44, 95% CI 1.00-19.70) and participants with lower life satisfaction scores also were more inclined toward pregnancy termination (aOR 0.20, 95% CI 0.07-0.59).

Conclusion: Parents of children with intellectual disabilities vary in their prenatal testing and pregnancy termination inclinations. Some of this variation is explained by general abortion attitudes, but life satisfaction also plays a role. As new tests for intellectual disabilities become available, guidelines should ensure that

testing is available to women who desire it, while recognizing that many women prefer not to undergo testing or would not terminate their pregnancy if a disorder was diagnosed.

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11. ASSESSING WOMEN'S SOURCES OF CHILDBIRTH INFORMATION: ARE THEY ADEQUATELY INFORMED ABOUT INDUCTION OF LABOR AND CESAREAN DELIVERY? (DEC)

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Purpose: Induction of labor and cesarean delivery are increasingly common labor and delivery procedures, affecting 20% and 30% of women, respectively. We sought to identify sources of information regarding childbirth and ascertain how well informed pregnant women feel about these procedures.

Method: This is a cross sectional study of pregnant women at 24-36 weeks gestation. Participants completed a face-to-face interview, which included the administration of a questionnaire regarding sociodemographics, reproductive history, sources of information about childbirth, and participants' views of the adequacy of information they had received about labor in general, induction of labor, medications used in labor, pain control options, vaginal and cesarean delivery, postpartum recovery, newborn care, and breastfeeding. Multivariable regression was utilized to assess predictors of preferred sources of knowledge about childbirth and of feeling adequately informed.

Result: In this population of 160 women, healthcare providers (87%), family and friends (74%), past experience (67%) and the internet (64%) were the primary sources of information about childbirth. Only 22% of the participants cited prenatal classes as a source of information. 85% felt that they had enough information about childbirth, but 46% felt they were not adequately informed about cesarean, and 33% felt they were not adequately informed about induction of labor. The only significant predictor of feeling adequately informed was childbirth history; not surprisingly, multiparous women were more likely to feel adequately informed. Educational level and race/ethnicity were not predictive of feeling adequately informed, or of reporting particular sources of information.

Conclusion: Most participants obtained their childbirth information from healthcare providers, family and friends, past experience, and the internet. Women report a need for more information about cesarean delivery and induction of labor, and most do not identify prenatal classes as a significant source of knowledge. Given the recent dramatic increase in the number of women undergoing induction of labor and cesarean delivery, providing adequate information to pregnant women regarding these procedures is crucial. This information should be considered when designing patient education programs for pregnant women and counseling women about what to expect on labor and delivery.

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12. TRAINING HEALTH PROFESSIONALS IN SHARED DECISION MAKING: AN INTERNATIONAL ENVIRONMENTAL SCAN (DEC)

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Purpose: Training health professionals in shared decision making (SDM) is necessary to implement SDM in clinical practice. We identified and critically appraised training programs in SDM for health professionals.

Method: Data sources included experts in SDM; organizations and individuals involved in training healthcare professionals, including members of our research team; and systematic reviews of SDM. We favoured sensitivity over specificity and included any training program or stand-alone educational activity in SDM for any healthcare professional (pre- or post-licensure) in any language. Pairs of reviewers independently extracted data on the programs' characteristics (program name, objectives and duration; author contact information; program creation date; country of origin; languages in which the program was available; sources that informed the program; target population; clinical context; learning activities; elements of SDM covered; and evaluation methods). We computed the frequency counts of each of the programs' characteristics. The programs' developers validated our data extraction.

Result: We found 55 programs created between 1996 and 2011 in 15 countries, produced in 9 languages. We extracted data from 21 articles, 19 PowerPoint presentations, 22 short descriptions or syllabi, 11 training manuals, and 3 DVDs. The three most frequently identified clinical contexts were cancer (n=9), palliative care (n=5) and prenatal screening (n=3). Thirteen programs only targeted pre-licensure health professionals, 32 only targeted licensed professionals, and 7 targeted both. Most programs targeted physicians, including residents (n=28), or targeted nurses (n=12). Programs' duration ranged from 15 minutes to 12 weeks. Teaching methods included large group sessions (n=16), small group sessions (n=35), auto-tutorials (n=15), the dissemination of printed educational material (n=22), audit and feedback (n=24), case discussions (n=38) and simulations (n=33). Seventy-two percent of programs covered all essential elements of SDM, and 14 programs reported on their evaluation of the following outcomes: satisfaction of trainees (n=10), knowledge and skills in SDM (n=6), SDM behaviour (n=5) and patient health outcomes (n=6).

Conclusion: Programs training health professionals to deliver SDM are being steadily introduced into practice world-wide. These programs vary in how and what they deliver. There is sparse evidence of their effectiveness on health professionals' SDM behaviour and on patient outcomes. We suggest the need to agree on the competencies required for professionals to practice SDM and measures to evaluate the impact of professionals' practice of SDM.

13. COMPARISON OF PREFERENCE ASSESSMENT METHODS BASED ON PROSTATE CANCER PATIENT CHARACTERISTICS (DEC)

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Purpose: The objective of this study was to compare three methods of prostate cancer treatment preference assessment [time trade-off (TTO), rating scale (RS), and Likert-type scale] according to patient demographic and clinical characteristics.

Method: A cross-sectional sample of men diagnosed with localized prostate cancer ($n = 410$) was recruited from two Veterans Health Administration and university-based urology clinics. Consented participants, diagnosed within five years of recruitment completed a self-report TTO, RS, and the Values Insight and Balance Evaluation scales (VIBEs). The TTO and RS elicited preferences on four domains including urinary,

erectile and bowel symptoms, and prostate-related problems. The VIBEs is a 46-item scale measuring the importance of 11 different domains including urinary function, sexual function, gastrointestinal (GI) symptoms, hormonal symptoms, radiation therapy, surgery, survival, personal and family responsibilities, well-being, self-image, and mood. Socio-demographic and clinical characteristics included in the hierarchical regression analysis were age, relationship status, ethnicity, education level, employment status, household income level, comorbidities, Gleason score, and PSA level.

Result: Most of the participants were Caucasian (83%), living with a significant other (61%), had some college education or less (67%), were unemployed or retired (73%), and had an income above 30K (58%). The regression analyses revealed that age was a significant independent predictor of sexual function (b=-0.04; p<0.0001), surgery (b=0.03; p<0.001), TTO (b=0.004; p=0.03) and RS (b=0.95; p=0.007) erectile problems, and RS prostate-related problems (b=0.60; p<0.001). Ethnicity was a significant predictor of sexual function (b=-0.69; p<0.001), GI symptoms (b=-0.41; p=0.001), responsibilities (b=-0.33; p=0.04), self-image (b=-0.55; p<0.001), and surgery (b=-0.36; p=0.03). Education level was a significant independent predictor of self-image (b=-0.55; p<0.001) and survival (b=-0.22; p=0.03).

Conclusion: Men diagnosed with prostate cancer report a wide range of considerations in making decisions about treatment. Concerns range from specific treatment outcomes to impact on family responsibilities and self-image. All three types of preference assessment measures were sensitive to differences in age; however, ethnicity was only associated with GI symptoms on the VIBEs, which was not captured by the bowel problems TTO or RS measure. Compared to the TTO and RS, the VIBEs captured a broader range of patient treatment outcome concerns with its expanded domains of treatment considerations.

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14. PILOT SURVEY OF PHYSICAN PREFERENCES FOR TEST THRESHOLDS FOR PEDIATRIC NEUROIMAGING GUIDELINES (DEC)

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Purpose: To determine physician preferences for test thresholds for pediatric neuroimaging guidelines, and to identify beliefs associated with threshold preference.

Method: The following types of attending physicians at our institution in Canada were surveyed: family physicians, general pediatricians, child neurologists, pediatric neurosurgeons, and pediatric radiologists. Survey participants were presented with results from a hypothetical clinical prediction rule that determines the risk of treatable pathology in children with recurrent headache. Participants were asked to state whether, as part of a guideline development committee, they would recommend routine neuroimaging in addition to follow-up for children with 0.1%, 0.4%, 1%, 10%, 25%, or 50% risk of treatable pathology. Levels of risk were based on a prior unpublished pilot. Participants were asked if they would be willing to endorse guidelines with the recommendation opposite their preference for the 1% category, and to rate their agreement with 13 beliefs about pediatric neuroimaging guidelines using a 7-point Likert scale. Participants were categorized as having a high (would not recommend neuroimaging for 0.4% or lower categories) or low threshold preference. Belief items were also summarized using binary variables. Associations between threshold preference and beliefs were evaluated using Fisher's exact test.

Result: At the time of submission, 12 eligible participants completed the threshold questions and 11 completed the entire survey. The proportion of subjects who would recommend routine neuroimaging for each risk category was: 50% (12/12); 25% (12/12); 10% (12/12); 1% (9/12); 0.4% (5/12); and 0.1% (3/12). All participants' answers were internally consistent. Of five subjects with low thresholds, two were willing to endorse guidelines recommending against neuroimaging for the 1% category. Agreement with several

belief items about neuroimaging showed nonsignificant associations with a high threshold preference in this small sample: that it is appropriate to consider the monetary cost to society (p=0.061); that patient comfort should be considered (p=0.182); and that it would be possible to create a clinical prediction rule that accurately determines risk for children with recurrent headaches (p=0.182).

Conclusion: These preliminary results suggest that there is substantial variability in physician preferences for test thresholds for pediatric neuroimaging guidelines, which could impact both guideline development and adherence. Specific beliefs may be associated with threshold preference. We plan to perform a similar survey in a national sample.

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15. COMPARING ANNOUNCED WITH UNANNOUNCED STANDARDIZED PATIENTS FOR ASSESSING DIAGNOSTIC ERROR (DEC)

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Purpose: To estimate the increase in difficulty when assessments of clinicians' propensity to make contextual errors in diagnosis are performed by unannounced vs. announced standardized patients (SPs).

Method: We conducted a combined re-analysis of data from two previously published studies using the same actors, cases, and outcomes but varying in whether clinicians knew they were seeing SPs and in the level of expertise of the clinician. Participants in the original studies included 111 board-certified internists visited by unannounced SPs in their practices in the Midwest USA, and 59 4th year medical students examining announced SPs in a clinical performance center at a Midwestern medical school. We compared likelihood of probing a biomedical red flag mentioned by the standardized patient, likelihood of probing a contextual red flag mentioned by the standardized patient, likelihood of writing an appropriate treatment plan.

Result: Attending physicians measured with USPs significantly underperformed 4th year medical students measured with SPs in the probing of the biomedical red flag (adjusted OR=0.45 (0.30 to 0.67)), in the probing of the contextual red flag (adjusted OR=0.66 (0.45 to 0.99) and in planning appropriate care (adjusted OR=0.43 (0.27 to 0.67)).

Conclusion: Assuming that attending physicians are in fact more competent than medical students, and at least as motivated to provide correct care for patients as medical students are to perform well in a no-stakes assessment, the outstanding difference between performance measures was the SP procedure. This reanalysis provides a lower bound estimate of the difference in difficulty: USPs are at least 1.5 to 2.3 times more difficult than equivalent SP cases. This study has the usual limitations of a secondary data analysis. Nevertheless, our findings suggest that traditional SP assessments, such as those used for licensure, may not be sufficiently sensitive to predict important lapses in how physicians make diagnostic decisions in actual practice. As other assessment methods, such as chart review or patient surveys, are also insensitive to overlooking information in the clinical encounter, further study and targeted use of unannounced standardized patients in practice may be warranted.

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16. SURGICAL TREATMENT CONSULTATIONS WITH LUNG CANCER PATIENTS: A QUALITATIVE AND SURVEY-BASED PILOT STUDY (DEC)

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Purpose: Previous research examines the nature of shared decisions in clinical encounters, but relatively little work focuses on understanding shared decision-making during surgical consultations. This project focuses on treatment consultations between surgeons and patients diagnosed with probable non-small cell lung cancer.

Method: Forty consultations between surgeons and patients are in the process of being audio-recorded and transcribed at an urban Midwest academic institution. These data are supplemented with pre and post consultation surveys of surgeon risk assessments and patient knowledge, health literacy, numeracy, beliefs and attitudes relevant to treatment decisions. Among other variables, each consultation transcript is coded for: 1) patient involvement (Elwyn's Option Scale), 2) specific types of information exchanged (e.g. disagreements, confusion, question asking), and, 3) treatment decisions. Qualitative findings are linked with patient and surgeon survey data to understand how surgeon's risk assessments and patients' literacy, numeracy, and beliefs contribute to the nature of the consultation and the post-consultation assessment of the process.

Result: To date 7 patients (age 58-80) have completed surveys. Qualitative analyses of five transcripts show two types of decision-making patterns emerging. The first type, an "informational decision", (n=3) consisted of two phases: 1) surgeon presents information, 2) patient accepts recommendation; decision is made. The second (n=2) "deliberation decision" showed three phases: 1) surgeon presents information; 2) patient expresses discord (confusion, disagreement, questioning) deliberation occurs; and 3) resolution is reached and a decision made. Preliminary findings corroborate the literature for the deliberation decision type. We extend the literature through our finding of the first decision-making pattern showing that surgeon-patient consultations are sometimes bereft of a 'deliberation' phase. Post-consultation survey data indicate that, even though all patients reported having received enough information, most did not believe that they understood the relevant risks. Preliminary analysis suggests that low health literacy and numeracy might play a role in patients' limited understanding.

Conclusion: Surgeons and lung cancer patients' consultations comprise at least two types of decision-making: an "informational decision" or a "deliberation decision" pattern. Preliminary results indicate that, even when patients claimed the information provided them was sufficient, their understanding of relevant risks was limited and this could be partially due to lower health numeracy and literacy. Findings from this project will help to understand and improve cancer treatment decision-making in the consultation.

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17. WHAT DEFINES QUALITY IN RISK COMMUNICATION? (DEC)

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Purpose: Government and other authorities frequently need to inform people about risk. The purpose of this paper is to explore aspects of the quality of risk communication and the potential discrepancies in views on quality between provider and user of risk information. Further, this study evaluates whether risk information

affects concerns about health risks. The risk scenario applied is radiation from mobile phones and mobile masts.

Method: The study was based on an internet survey with 1687 Danish respondents aged 20-69 years. The website was programmed to randomly assign respondents to three types of information on radiation: **(A) a** brief technical summary of existing knowledge about radiation from mobile phones and masts, (B) a longer, more comprehensive, and more technical information on existing knowledge about radiation from mobile phones and masts, and how radiation from mobile phones may or may not affect health, and (C) a short statement with simple measures on how to reduce exposure to radiation from mobile phones and consequently any potential health risk. Before and after the information on risk was presented, the respondents were asked to rate their degree of concern regarding health risks from radiation from mobile phones.

Result: The respondents rated the short statement (A) on how to reduce exposure to radiation from mobile phones more trustworthy and useful than the more technical information (B and C). Further, the study revealed that the information provided increased the degree of concern among a large proportion of respondents, irrespective of the type of information provided (while decreasing concerns among others).

Conclusion: The provider of risk information may define quality in communication as comprehensive and technically correct information that enables the receivers of the information to make personal and informed judgments on the degree of risk and the value of risk reduction based on individual preferences. In the present case, respondents rated short information with specific guidance and no technical information as more trustworthy and useful. These results suggest that there may be some degree of non-alignment between providers and user's perception of what constitutes quality in risk communication, which suggests that providers of risk information may want to rethink the format of their risk communication.

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18. CAN A DECISION SUPPORT PROGRAM HELP A COHORT OF MS PATIENTS WITH DEPRESSION? IMPLEMENTATION OF A DECISION SUPPORT PROGRAM IN A MULTIPLE SCLEROSIS-PSYCHIATRIC CLINICAL MICROSYSTEM (DEC)

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Purpose: Multiple sclerosis (MS) is a chronic autoimmune disease, affecting 4 in 100,000 persons. Patients with MS have a 50% lifetime prevalence of depression. The prevalence of suicide in MS is 4-7 times higher than the national average. Decision aids (DAs) have been shown to help patients make treatment choices tailored to their personal preferences. The goal of this study was to evaluate a DA on a cohort of MS patients making an initial treatment decision for depression.

Method: Patients at a MS clinic received the video DA "Coping with Symptoms of Depression" Health Dialog© 2005. Participants were asked to: 1) complete a pre-DA questionnaire, 2) watch the DA, and 3) complete a post-DA questionnaire. The DA was incorporated into the clinical process using a microsystems approach. Clinicians reviewed patient responses to identify gaps in knowledge and to guide follow up discussion about which treatments would be clinically appropriate. Measures: Patient demographics, treatment intention before and after viewing DA, preferred role in decision making, knowledge questions (multiple choice), value scores (0 not important – 10 extremely important) and DA acceptability

Result: Between 9 November 2010 and 30 April 2011, 26 patients borrowed a DA; 16 (62%) enrolled in the study by completing a questionnaire. Average age was 44.5. 81% were female. After watching the DA, fewer patients were unsure about their treatment decision (44% vs. 13%), gaps in patient knowledge were

identified from knowledge question responses, and patients had a clear preference for sharing the treatment decision with their clinician (88%). "Getting relief from depression symptoms" (mean=9.3/10) and "Returning to usual activities" (mean 9.0/10) were the most important patient values. The majority of participants (71%) felt it was important for health care providers to offer the DA to patients.

Conclusion: Distributing a patient DA for treating depression appears to be beneficial for this group of patients. After viewing the video and meeting with their provider, patients were well informed, clear about their personal values and prepared to make a decision. Patients found the DA acceptable and would recommend it to others facing the same decision. Clinicians found the information from the questionnaire to be of benefit in guiding their follow-up consultation. This study presents initial research on the use of decision support in multiple sclerosis psychiatric care.

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19. ASSESSING THE NEED FOR AND DEVELOPING A MENOPAUSAL SYMPTOM DECISION AID IN A WOMEN'S HEALTH SPECIALTY PRACTICE (DEC)

Priscilla M. Flynn, DrPH and *Amy T. Wang, MD, Mayo Clinic, Rochester, MN*

Purpose: The Women's Health Initiative results released in 2002 heightened fear and confusion regarding hormone therapy in the management of menopausal symptoms. Many alternative therapies exist; however the risk-benefit ratio for choosing hormonal or nonhormonal therapies for symptom relief is often confusing for patients and physicians alike. We aimed to assess the need for and develop a decision aid (DA) for physicians counseling patients on treatment of menopausal symptoms for women within 5 years of natural menopause.

Method: A literature search was conducted to identify the best available evidence for menopausal therapies and for validated DAs on menopausal therapy. We conducted a focus group of all physicians in a specialized clinic in menopausal and sexual concerns to determine the need for a menopausal therapy DA. We observed germane physician-patient encounters over a period of 6 months, with at least 2 observation sessions of each physician. Field notes recorded interactions between patients and clinicians, with focus on primary speakers, patient and physician initiated topics, and content of the visit. Two additional focus groups consisting of physicians and allied staff treating women for menopausal symptoms provided feedback on a prototype DA.

Result: The initial physician-focus group felt a well-designed point-of-care DA would be helpful but expressed concerns that the numerous menopause-related symptoms, co-morbidities, and wide range of treatment options were too complex for a DA. Shadowing results indicated that physicians are the primary discussants during clinical encounters and were centered on hormone therapy risks. Comprehending the vast amount of information presented appeared difficult for patients. Based on the physician focus group, provider-patient observations, literature search, and input from experts in DA development and design, the authors developed an issues-driven point-of-care DA. The initial prototypes were well-received by the healthcare provider focus groups and feedback was used to inform subsequent versions.

Conclusion: Physicians' support of developing a DA for menopausal symptoms was enhanced following involvement in the decision to develop and provide input on several prototypes. Although patient input is a necessary step in DA development, initial buy-in by physicians as end-stage users is critical, as DA use is determined by clinicians. After this initial process, we are now ready to test the DA in real patient encounters.

20. HEALTH LITERACY, GENETIC LITERACY, AND NUMERACY IN A DIVERSE POPULATION OF PREGNANT WOMEN: IMPLICATIONS FOR PRENATAL TESTING DECISION MAKING (DEC)

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Purpose: To measure health literacy, genetic literacy, and numeracy in a diverse population of pregnant women.

Method: Cross-sectional study of pregnant women at less than 20 weeks gestation. Participants completed an interviewer-administered questionnaire, which included sociodemographic information and validated measures of health literacy (Short Test of Functional Health Literacy), genetic literacy (Rapid Estimate of Adult Literacy in Genetics) and numeracy (Numeracy Scale). Numeracy scores were dichotomized into high and low, literacy was defined as adequate, marginal, or inadequate, and low genetic literacy was defined as scoring at $\leq 6^{th}$ grade level. Descriptive analyses were performed to profile the sample. Multivariate logistic regression was utilized to examine predictors of numeracy and genetic literacy.

Result: 383 women participated in the study. Their mean age was 30.8. The sample was racially/ethnically diverse (51% White, 25% Black, 9.1% Latina, 16% Asian), highly educated (61% college graduates), and over half were nulliparous (56%). 99% had adequate health literacy, but 10% had low genetic literacy, and 41% had low numeracy. General health and genetic literacy were moderately correlated ($\rho = 0.59$, $p<0.05$); the correlation between health literacy and numeracy was not as strong ($\rho = 0.41$, $p<0.05$). In multivariate analysis, educational level was the only significant predictor of numeracy or genetic literacy. However, while 99% of college graduates had adequate genetic literacy, only 79% of these women had high numeracy.

Conclusion: In this sample, educational level was the only significant predictor of genetic literacy and numeracy; however, even among college graduates, nearly 20% demonstrated low numeracy. Low numeracy may impact women's ability to understand information regarding the risk of genetic conditions and obstetrical procedures. This problem is further compounded by lack of understanding of health and genetic terminology in lower literacy populations. These issues should be considered when counseling women about risk during pregnancy.

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21. QUALITATIVE ASSESSMENT OF INFORMATION-SEEKING BEHAVIOR AND LEARNING PREFERENCES AMONG POSTGRADUATE PHYSICIAN ASSISTANTS AND NURSE PRACTITIONERS (DEC)

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Purpose: Understanding clinicians' information-seeking behavior is critical for primary training curricular decisions and continuing professional development. How, and from which sources healthcare providers seek information and how they integrate new data into practice, provides important additional knowledge. These data will also have a direct effect on one's ability to perform optimal evidence-based patient care.

Method: A ten-year literature search was performed within the PubMed, EmBase, and CINAHL databases.

Results of this search supported the design, testing, validation, and distribution of a 10-question survey tool to a randomized cohort of Physician Assistants (PAs) and Nurse Practitioners (NPs). Demographic data was matched for each group and questions were designed to answer respective learning preferences and

assimilation of new knowledge into clinical process. Result: Surveys were emailed to an audience of 7,914 PAs & NPs; with an opt-in return rate of 48%. Aggregate sample size of 3,811 practitioners (PAs = 1,872 / NPs = 1.939) facilitated descriptive analysis for both groups. Both groups spend 3 or 4 hours/week searching the online literature; with a majority of both (58.4% PAs; 53.6% NPs) using Google search engines as a first step for finding answers and/or information. Patient -centered questions, asked weekly, were primarily within the realm of "Treatment Guidelines" (PAs 21.6%) or "Other" (NPs 23.2%) domains. The "Most Useful" sources for keeping abreast of advances in care were Clinical Practice Guidelines (PAs & NPs 94.4%), Continuing Education Courses (PAs 95.2%; NPs 91.1%), & Peer-reviewed Journals (PAs 87.3%; NPs 95.4%). When queried as to the factors that were "Very Influential" for adopting new advances, Clinical Practice Guidelines, again, had a substantial influence (PAs 93.7%; NPs 96.8%). Peer-reviewed Journals were the preferred formats for self-directed learning (PAs 90.5%; NPs 87.3%), but Online Archived Courses were favored by PAs over NPs (76% vs 47.1%, respectively). Barriers to optimal information assimilation were similar for both groups. The issue of limited availability of free valuable resources was a common retort.

Conclusion: Despite philosophical differences in training, PAs and NPs have some common behaviors with respect to information-seeking behavior. Conversely, striking differences do exist between these two non-physician providers. Noteworthy is that the general approach to continuing educational design does not take into account these differences & preferences noted for the first time, here.

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22. ENHANCED SELF-EFFICACY REGARDING SKIN CANCER TREATMENT: THE IMPORTANCE OF INDIVIDUAL DIFFERENCE FACTORS VERSUS EXPOSURE TO A PATIENT DECISION AID (DEC)

Dana L. Alden, PhD, University of Hawaii at Manoa, Honolulu, HI, Qimei Chen, PhD, University of Hawaii, Honolulu, HI and Jennifer Aaker, PhD, Standford University, Palo Alto, CA

Purpose: A 2009 Cochrane review points to multiple positive outcomes associated with patients using decision aids (PDAs) to assist treatment/screening decisions. PDAs are known to reduce decision conflict and passive decision-making. However, research that includes PDA exposure in a larger theoretical net with individual difference factors such as "desire for information/control" (HOS) and "life satisfaction" (LS) is limited. A recently developed scale (CAS) measures cancer treatment self-efficacy to understand/participate (CAS1) and maintain a positive attitude (CAS2). This study employs representative adult panel samples and a scenario-based method to investigate PDA versus HOS and LS effects on CAS1 and CAS2.

Method: Two online panel samples in the US totaling 935 adults (age 23-81, mean=50; 54% female/46% male) were exposed to a scenario in which they were recently diagnosed with basal cell carcinoma and about to meet with their dermatologist to decide on treatment. The first group (n=522) viewed a PDA with treatment cost/benefit information and values exploration. The second group (n=413) received limited information about the diagnosis. Respondents in the first group evaluated the PDA very positively using standard measures. Given minimal between group differences, analyses were conducted on the overall sample.

Result: PCA identified the same factor structure for CAS found in earlier research. Two regression models were run with CAS1 and CAS2 as dependent measures. Age and gender were included as controls along with perspective taking, which was added to control for possible differences in scenario visualization ability. Both HOS (β's=.24, .13) and LS (β's=.12, .24) were positively related to CAS1 and CAS2 (p<.001). Despite inclusion of two individual difference predictors and three controls, PDA versus no PDA marginally enhanced CAS1 (β=.06; p=.075) and significantly enhanced CAS2 (β=.08; p=.007). Stepwise regression produced similar results.

Conclusion: This study provides further evidence of CAS scale validity as a measurement tool for patients with newly diagnosed cancer. More importantly, the study finds PDA effects on cancer self-efficacy in the presence of theoretically relevant individual difference factors. Effects were marginally significant for "ability to understand/participate" and significant for "ability to maintain a positive attitude." Given larger beta weights for individual difference factors, providers are advised to consider their patients' psychological predispositions such as HOS and LS in addition to PDA exposure when evaluating cancer self-efficacy.

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23. DISCIPLINARY ACTIONS IN A NO-FAULT SYSTEM: ACTUAL RISK, RISK BIASES AND RISK PERCEPTION PREDICTORS? (DEC)

*Geir Godager and **Sverre Grepperud**, University of Oslo, Oslo, Norway*

Background: Many studies are concerned with both patients' and physicians' understanding of risk and uncertainty in association with treatments (diagnosis and effectiveness), however, less is known about physicians' perceived risk of sanctions, in particular so for no-fault systems. **Objectives/**

Purpose: In this study perceived discipline risks are compared with the actual discipline risk together with an identification of variables that may explain variations in such risk perceptions. Finally, we investigate if risk perceptions have an effect on clinical decsion making.

Method: Postal questionnaire to a panel of 1649 Norwegian medical doctors of which 1072 responded, to all or some questions, after a reminder (65%). The questions relevant for this study were answered by between 891 to 964 respondents (54% to 58.5%). Ordinary Least Squares and Probit models, allowing for endogenous regressors, were estimated.

Results: In average physicians overestimate the risk by 50% for the most punitive disciplines (warnings, revoke of license and/or authorization), while they underestimate the risk for the less severe one (reprimands). Discipline risk perceptions are found to be highest among physicians in private practice. No significant effect from the perceived liability risk on the self-assessed propensity to adhere to clinical guidelines was identified, however, private practice physicians were found to be less likely to adhere to clinical guidelines than those outside of private practice.

Conclusion: This study shows that the discipline risk is higher in a no-fault systems than in the US malpractice system. Furthermore, the degree of risk-bias is less if compared with liability risk biases in malpractice systems suggesting that physicians in no-fault systems are well informed about actual risks. Our findings also confirm that physicians in private practice differ from those outside of private practice both when it comes to risk estimation and the degree of adherence to clinical guidelines.

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24. BUDGET IMPACT OF RAPID HIV TESTING AND COUNSELING IN STD CLINICS IN THE UNITED STATES: A THRESHOLD ANALYSIS (ESP)

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Purpose: Many US sexually transmitted disease (STD) clinics conduct routine enzyme immunoassay (EIA) laboratory HIV testing that requires follow up to receive results. On-site rapid HIV testing delivers results in 20 minutes at a higher initial cost, but reduces follow up costs and risks of loss to follow up for newly identified HIV cases.

Methods: Using micro-costing techniques, we determined the average cost per person offered a rapid HIV test for two strategies: 1) rapid test with information only and 2) rapid test with risk-reduction counseling. Data were from seven public health STD clinics participating in a randomized trial comparing the effectiveness and cost-effectiveness of the two strategies. Data included staff activity logs, clinic overhead including additional space for on-site rapid testing, and supplies. We applied national labor rates and supply costs. Analysis was from the STD clinic perspective; start-up costs and patient costs were excluded. We calculated the threshold follow up cost saved per newly detected HIV case (including the cost to inform HIV-uninfected patients who return for their results) that would offset the incremental cost of on-site rapid testing. We varied the prevalence of undetected HIV infection between 0.1% and 1.0%.

Results: Offering rapid HIV testing with information costs $19/patient ($7 labor/overhead, $11 materials, $1 quality assurance (QA)/supervision) and offering rapid HIV testing with counseling costs $49/patient ($29 labor/overhead, $13 materials, $7 QA/supervision). Assuming $5/patient cost for EIA testing, the threshold follow-up cost savings to achieve budget neutrality is $13-$131 per newly detected HIV case for rapid testing with information, and $37-$375 for rapid testing with counseling (see figure).
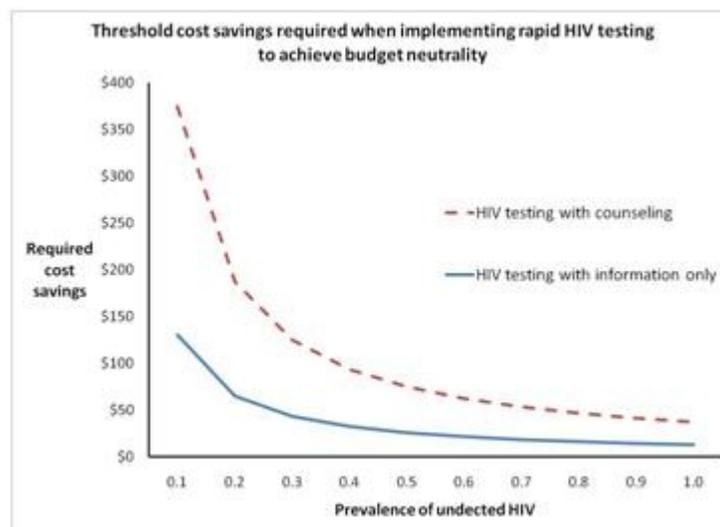
Conclusion: Assuming a cost of $34/hour for a disease intervention specialist (DIS) for HIV test follow-up, budget neutrality requires a savings of 0.4-11.0 DIS hours per newly detected case depending on testing strategy and HIV prevalence. This does not include the public health benefits of avoiding loss to follow up and patient benefits of providing same day results. Public STD clinics may be able to implement rapid HIV testing within their current budgets, excluding start-up costs.

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25. ARE INDICATORS OF QUALITY CARE FOR COMORBID CONDITIONS ASSOCIATED WITH COSTS OF CARE FOR PROSTATE, BREAST, AND COLORECTAL CANCER SURVIVORS AND MATCHED CONTROLS? (ESP)

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(3)Dana-Farber Cancer Institute, Boston, MA, (4)Institute for Clinical Evaluative Sciences, Toronto, ON, Canada

Purpose: To compare the association between quality indicators and costs among cancer survivors and non-cancer controls.

Method: Surveillance Epidemiology and End Results (SEER)-Medicare cases diagnosed in 2004 who were enrolled in Medicare's fee-for-service program from 365 days prior to the time of diagnosis to three years (1095 days) after the date of diagnosis were compared with matched controls. Frequency matching was based on SEER-region, sex, race, age, and Charlson comorbidity index category. Quality indicators were drawn from previously reported research; indicators represent follow-up, monitoring, and continuing care for comorbid chronic conditions (including diabetes, coronary artery disease, chronic heart failure, stroke/transient ischemia, anemia and GI bleed, COPD/asthma, and depression), avoidance of serious clinical manifestations, therapeutic intervention, and workup at initial diagnosis. We used simple linear regression and multivariable linear regression controlling for SEER region, sex, race, Charlson comorbidity index, and the census tract median income and the proportion of individuals in a census tract with high school (or less) education only to assess the relationship between quality indicators and total costs from days 366 through 1095. Only those eligible for each quality indicator were included in the relevant comparison.

Result: Frequency matching yielded two controls (N=17322) for each case (N=8661). The matched controls had a statistically significant relationship between 19 of the 36 quality indicators using simple linear regressions while the cancer cases had 13 statistically significant relationships. In multivariable regression analyses, there were 17 and 12 statistically significant relationships respectively.   Measures of appropriate continuing care (i.e., appropriate frequency of visits) for chronic conditions and appropriate workup at initial diagnosis were associated with higher overall costs. Avoidable serious clinical manifestations accounted for larger positive incremental costs. Appropriate post-inpatient care was associated with lower costs for the small number of statistically significant relationships. More frequently than not, incremental changes in costs associated with measures of quality were larger (more positive or more negative) for the matched controls than for cancer survivors.

Conclusion: We found some associations between better care quality and lower costs, particularly for those who avoid serious clinical manifestations and who obtain appropriate post-inpatient care. Relationships tend to be stronger for non-cancer controls compared to cancer survivors. In other cases, providing higher quality care, particularly ongoing care of chronic conditions, is associated with higher costs.

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26. WEALTH GRADIENT IN CESAREAN BIRTHS IN INDIA: IMPLICATIONS FOR PUBLIC HEALTH POLICY (ESP)

*Aparajita Zutshi, PhD* and *Arkadipta Ghosh, PhD, Mathematica Policy Research, Princeton, NJ*

Purpose: To explain the strong wealth gradient in the incidence of cesarean births in India and identify opportunities for policy interventions.

Method: Using data from the 2005-06 National Family Health Survey (NFHS), we employ multivariate regression methods to identify sources of variation in cesarean births, by wealth.

Result: The rate of cesarean births rises sharply with wealth and is 27 percentage points higher in the richest quintile of household wealth than in the poorest quintile in the urban sample; the difference in the rural sample is 23 percentage points. These differences are much higher than the $10 - 15$ percent rate of cesarean births recommended by the WHO and cannot be fully explained by risk factors for a cesarean birth; less than

half of the gradient is driven by factors such as maternal age, birth order, multiple pregnancy, and birth weight. Further investigation reveals that an additional 33 – 35 percent of the gradient is driven by delivery in private facilities, whether the woman and her partner have more than a high school education, and whether the woman has independence in making financial decisions. Even after accounting for these factors about 15 percent of the gradient remains unexplained (Figure 1).

Conclusion: Since risk factors that justify a cesarean birth account for less than half of the wealth gradient, our findings point towards a significant scope for policy interventions to address the misallocation in cesarean rates that vary by household wealth in India.

Figure 1: Unexplained Difference in Cesarean Birth Rates in Urban India between the Lowest Wealth Quintile (Quintile 1) and Each of the Higher Wealth Quintiles, According to Five Models

Model 1 controls for only state fixed effects, and indicators for month of birth and year of birth.
Model 2 adds controls for pregnancy-related risk factors, such as mother's age at birth, birth weight, parity, and multiple births, etc.
Model 3 adds controls for household's background characteristics such as caste and religion.
Model 4 adds controls for additional background characteristics such as respondent's (mother) and partner's schooling, respondent's control over household decisionmaking, and respondent's contact with popular media (newspapers, radio, and TV).
Model 5 adds controls for the type of healthcare facility where the child was delivered (public versus private)

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27. DOES IT MAKE SENSE TO IDENTIFY GENETIC PREDISPOSITION IN PRIMARY PREVENTION OF COMMON ADULT DISEASE (ESP)

Jennie Kempster, M.S., University of California, San Diego, Health Services Research Center, La Jolla, CA and Ted Ganiats, MD, University of California San Diego, La Jolla, CA

Purpose: Genetic tests can be used in high-risk individuals to see if they are genetically disposed to disease in order to target or tailor primary preventive interventions. We evaluated the cost effectiveness of this practice compared to administering the standard intervention to the whole high-risk group.

Methods: Data from peer-reviewed cost effectiveness models for preventive interventions in those identified as high-risk through common methods such as age, body mass index, or family history, were used to estimate

the effect size that would be needed for an intervention in the positive genetic test group to be as cost effective as the standard intervention is in the whole high-risk population. The models used included increasing physical activity to prevent a range of common adult diseases; diet, weight reduction, and physical activity interventions to reduce the risk of type-2 diabetes; statins to reduce the risk of CVD; and aspirin to reduce the risk of stroke and myocardial infarction. The analysis was run varying the proportion of tested individuals identified as predisposed by the genetic test and varying the test cost.

Results: In many cases, testing to identify genetically predisposed candidates for non-standard primary preventive intervention is much less cost effective than administering the standard intervention to all high-risk individuals, even if the intervention costs are identical. Sensitivity analysis indicates that such genetic testing is only cost effective when the incremental effectiveness in genetically predisposed high-risk individuals is higher than is realistic. Even when test cost was $300 and the likelihood of a positive result was 15%, all interventions modeled required a relative increase in effect size among genetically predisposed high-risk individuals of at least 35% (35%-500%) to be as cost effective as the standard intervention in the high-risk group. When the test cost $1000 and the likelihood of a positive result was 5%, all interventions modeled required a relative increase in effect size among genetically predisposed high-risk individuals of at least 400% (400%-6000%) for genetic screening to be as cost effective as standard practice in the high-risk group.

Conclusions: The results indicate that unrealistic increases in effectiveness are necessary for genetic testing to be cost-effective in a primary preventive setting.

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28. ASSESSMENT OF INFLIXIMAB UTILIZATION PATTERNS ACROSS DIFFERENT SITES OF CARE FOR COMMERCIAL HEALTH PLANS (ESP)

Brad Schenkel, *Julie Vanderpoel, Chureen T. Carter and Denise Zomorrodian, Centocor Ortho Biotech Services, LLC, Horsham, PA*

Purpose: Various sites of care (SOC) exist for the administration of infusible therapies, such as infliximab (IFX). Multiple site characteristics may be important to healthcare decision-makers when evaluating SOC options, including drug utilization patterns. The purpose of this study was to report IFX vial utilization patterns for in-office infusion settings (IOI), hospital outpatient departments (HOPD), and alternate sites of care (ASOC).

Method: IFX claims were analyzed between 1/1/2010 and 12/31/2010 from the data of 74 United States commercial insurers representing approximately 192 million covered lives. IFX claims for a mixed population of patients (e.g., with/without biologic experience) were identified by J Code (1745) and ICD-9 codes (720.x, 555.x, 556.x, 714.x, 696.0, 696.1). The number of IFX vials per infusion (VPI) was derived from Health Care Procedure Code System entries and verified by charges. Mean VPI was analyzed across the aforementioned sites of care. Data were further analyzed across different regions of the United States (U.S.).

Result: Of the 420,430 IFX claims, 47% were for rheumatoid arthritis (RA) and 37% were for inflammatory bowel disease (IBD; Crohn's disease [CD] or ulcerative colitis [UC]). Seventy-nine percent of the RA and IBD claims were from the IOI setting, with only a minority of infusions being associated with HOPD or ASOC facilities (approximately 18% and 3%, respectively). The 2010 mean VPI for RA was 4.54, 4.90, and 4.78 in IOI, HOPD, and ASOC settings, respectively. Similarly, the mean VPI for CD and UC were 5.00, 4.92, 4.95 and 4.70, 4.98, 4.68, respectively, for IOI, HOPD, and ASOC. IFX utilization was consistent across the different geographic regions of the U.S.

Conclusion: These findings indicate that IFX utilization is similar for RA and IBD and consistent across different sites of care (i.e., IOI, HOPD, and ASOC), with a mean utilization of ≤ 5 vials per infusion. Therefore, utilization patterns do not appear to be a differentiating factor across the various SOC settings. Evaluation of other factors such as patient satisfaction, patient adherence, and costs may be useful in further characterizing existing SOC options, thereby supporting SOC decision-making by stakeholders.

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29. REFERENCE PRICING: AN INNOVATIVE BENEFIT DESIGN FOR CONTROLLING MEDICAL EXPENDITURES (ESP)

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Purpose: In response to ever-increasing health care costs and wide practice variation, self-insured employers are instituting innovative benefits designs to control their medical expenditures. Reference pricing establishes a fair price that the employer is willing to pay for health care services (typically lower than the rate negotiated between many providers and the health plan) and is gaining popularity among employers for commodity services. We report the potential savings in medical expenditures for an employer after instituting reference pricing for 498 common laboratory tests, colonoscopies, 37 MRIs, and 38 CTs.

Methods: We evaluated the 2010 claims for a self-insured company with 20,000 employees. We calculated the median price for each service and compared the potential savings if the reference prices (RPs) were set at 50% vs 80% of the median. Reference pricing is typically applied only to outpatients receiving care under non-urgent circumstances; thus for each category of service, we applied common exclusion criteria used among employers (e.g., excluding inpatients, patients undergoing chemotherapy or dialysis).

Results: The total medical expenditures for patients eligible for reference pricing was $52.1 million. There was enormous cost variance for individual procedures (e.g., median price among the 5274 claims for a standard lipid panel was $22, range: $3-$522). The total expected cost savings to the employer would be 4.4% if RPs were set at 80% of the median and 5.7% if RPs were set at 50% of the median. The savings opportunity was greatest for imaging tests (combined total for MRIs and CTs): 2.5% and 3.0% for RPs set at 80% and 50% of the median respectively; followed by labs (1.3% and 1.8% for RPs at 80% and 50% of the median), and colonoscopy (0.6% and 0.9% for RPs at 80% and 50% of the median).

Conclusions: Reference pricing is a promising means for controlling medical expenditures, especially for commodity services. Whether the expected cost savings will be realized and the extent to which lower cost providers consistently provide high quality care requires further careful evaluation.

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30. MEASURING STATED PREFERENCES TO IDENTITY ATTRIBUTE IMPORTANCE: IS IT A CASE OF 1 ATTRIBUTE WITH N LEVELS OR N ATTRIBUTES WITH ONLY 1 LEVEL (ESP)

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Purpose: Increasingly researchers are using stated preference methods to estimate preferences in health care using N attributes with 2 or more levels, often reporting on attribute importance (the value that one places on

the attributes presented) ignoring the impact of level importance (the value associated with the differences in the levels of a given attribute).

Method: We present two case studies examining attribute importance focused on liver cancer control. The first used discrete choice experiment (DCE) to examine 11 possible liver cancer control strategies where respondents chose among paired subsets of the 11 strategies based on an orthogonal array. The second used best-worst scaling (BWS) (Case 1) to explore the likely future impact of 11 emerging liver cancer control technologies using a balance incomplete block design (BIBD) that generated sets of 5 technologies, with respondents identifying the best and worst in each set. Both studies were analyzed assuming random utility (RUT) theory via a conditional logistic regression. The first simply regressed choice on the attributes present in the possible cards, but the second required an assumption of sequential best worst and the use of effects coding to estimate the marginal value of the 11 technologies to avoid the dummy variable trap.

Result: 120 experts in liver cancer completed both surveys, a response rate of 37%. Respondents includes hepatologists (40%), oncologists (22%), radiologists (13%), surgeons (18%) and other experts (19%) involved in hepatocellular carcinoma (63%), hepatitis (n=16%), transplantation (13%) and metastatic liver cancer (8%). From the DCE, the highest valued strategy was monitoring ask risk populations ($p<0.001$). From the BWS molecular targeted therapy was most valued ($p<0.001$).

Conclusion: We demonstrate two methods for the estimation of attribute importance within a RUT framework. The application of DCE requires an assumption that there are N attributes of only one level each, while BWS case 1 assumes that there are only 1 attribute, but with N levels. While we demonstrate that both the DCE and BWS can be used to estimate attribute importance, these competing methods make different assumptions, and hence, results are on different scales. More research is needed to directly compare the results of these two methods of estimating level importance on a single research question and common attributes/levels.

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31. COST-EFFECTIVENESS OF THE MOST COMMONLY USED NON-SURGICAL TREATMENTS FOR NECK PAIN (ESP)

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Purpose: The most commonly prescribed neck pain treatments in Canada and the United States are cyclooxegenase-2 selective inhibitors, exercise, manipulation, mobilization, and non-steroidal anti-inflammatory drugs. Our objective was to evaluate the cost-effectiveness of these five non-surgical treatments for acute non-specific neck pain in adult patients.

Method: A decision-analytic Markov model was constructed to simulate the costs and consequences of the clinical course of acute non-specific (mechanical) neck pain in a hypothetical cohort of patients. The perspective adopted was that of the health care payer and the analysis was conducted over a lifetime time horizon. Resource use and costs were derived from professional recommended fee schedules, the Ontario Health Insurance Plan Schedule of Benefits, and the Ontario Case Costing Initiative. Costs were expressed in 2008 Canadian prices. The impact of the beneficial and harmful treatment effects on health were expressed in quality-adjusted life years (QALYs). Costs and QALYs were discounted at 5% per annum. Model inputs included estimates of: 1) the clinical course of acute neck pain, 2) treatment effectiveness, 3) treatment-

associated risk of cerebrovascular, cardiovascular, and gastrointestinal adverse events, 4) background risk of adverse events in the general population, 5) standard gamble utilities directly elicited from a sample of 220 neck pain patients, and 6) direct and out-of-pocket costs. Cost-effectiveness was determined by using a willingness-to-pay threshold of $50,000 per QALY. Uncertainty surrounding model parameters results was explored with probabilistic sensitivity analysis with 10,000 simulations.

Result: Manipulation was cost-effective compared to the least costly alternative non-steroidal anti-inflammatory drugs (incremental cost-effectiveness ratio [ICER] = $25,123 per QALY). The ICER for mobilization was $381,926 per QALY. Cyclooxegenase-2 selective inhibitors and exercise were subject to simple dominance. Results of probabilistic sensitivity analyses suggested that non-steroidal anti-inflammatory drugs were most likely cost-effective at a willingness-to-pay of less than $24,000 per QALY whereas manipulation was most likely cost-effective between $24,000 and $50,000 per QALY.

Conclusion: Manipulation is cost-effective compared to non-steroidal anti-inflammatory drugs at a conventional threshold of $50,000 per QALY. Under varying thresholds, non-steroidal anti-inflammatory drugs are cost-effective at less than $24,000 per QALY. Forthcoming analysis will identify the main drivers of the uncertainty surrounding the decision about which non-surgical acute neck pain treatment to adopt.

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32. EIGHT YEAR COSTS OF TREATMENT FOR BREAST CANCER IN NORWAY – BY TNM STAGE AND DETECTION SETTING (ESP)

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Purpose: Mammography screening is expected to detect breast cancers at an earlier stage. Expected treatment costs in less severe cancers might be lower than in more severe cancers, due to reduced treatment intensity. Earlier detection increases life expectancy so less severe cancers might also lead to increased treatment costs compared to more severe cancers, due to a longer treatment period. The purpose of this study was to calculate treatment costs for breast cancer, exploring differences for similar TNM stages in different detection settings (screen detected cancers and non screen detected cancers).

Method: We collected data on resource use in hospitals for the period January 1st 2008 thru April 30th 2009 from the Norwegian Patient Registry (NPR) for women aged 50 to 69 who had been diagnosed with breast cancer in the period January 1st 1999 and December 31st 2008. As both treatment data and survival data were censored, expected treatment costs were calculated as a function of the mean cost and the survival probability t months after diagnosis by stage at diagnosis and detection setting. Cox proportional hazard models were used to calculate survival.

Result: Factors affecting survival were disability benefit, income, education, marital status, health region, detection setting, stage of breast cancer and age at detection. Preliminary results shows that patients with Ductal Carcinoma In Situ (DCIS) and cancers in stage I who were detected in screening, seams to receive initial treatment earlier compared to patients in similar stages with cancers detected outside of screening. Costs in the first ten years after diagnosis for TNM stage I cancers who were detected in screening and outside of screening, respectively, were $24585 and $46195. For stages II, III and IV, treatment costs for cancers detected in screening and outside of screening the first ten years were $55299 and $66794 (stage II), $49833 and $77722(stage III), and $71402 and $74138 (stage IV), respectively.

Conclusion: preliminary results shows that the cost of treating breast cancer diagnosed at screening tends to be lower for all stages compared to similarly staged cancers detected outside of screening. This might be

due to several factors, such as interval cancers in the non screening group or that screening reveals less severe cancers within the TNM stages. This should explored more thoroughly.

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33. ECONOMIC EVALUATION OF PRASUGREL COMPARED TO CLOPIDOGREL AFTER PERCUTANEOUS CORONARY INTERVENTION (ESP)

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Purpose: To analyze the cost-effectiveness of prasugrel compared to clopidogrel for patients who have undergone PCI (percutaneous coronary intervention) for acute coronary syndrome (ACS).

Method: We used a modified version of a Markov model (Model of cost-effectiveness of coronary artery disease (MOCCA)) previously developed by the Norwegian Knowledge Centre for the Health Services, to model the cost-effectiveness of prasugrel compared to clopidogrel. Possible events in the model were urgent target vessel revascularization (UTVR), myocardial infarction, bleeding and death. Incidences of events were based on Scandinavian registries. Costs of prasugrel and clopidogrel were based on list prices from the Norwegian Medicines Agency. Estimates of clinical efficacy were based on pooling of published RCTs. The model is built as a probabilistic model, hence, results are based on Monte Carlo simulations.

Result: Our modeling resulted in an increase in both life expectancy and costs with prasugrel. This gave an incremental cost-effectiveness ratio of $ 6,200 per life year gained for prasugrel compared with clopidogrel. The probabilistic sensitivity analyses demonstrated that prasugrel is cost-effective in 88% of the simulations. From our value of information analysis, it became evident that the decision depends mostly on the uncertainty in data on efficacy, and hence if new research should be conducted, this is the kind of data that has the highest potential to reduce decision uncertainty.

Conclusion: Prasugrel is likely to be more cost-effective than clopidogrel for ACS patients who have undergone PCI. This conclusion is, however, uncertain, and even for high levels of willingness to pay for health, there is some probability of clopidogrel being cost-effective.

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34. THE MOST APPROPRIATE METHODOLOGY FOR DEALING WITH MONOTONICITY IN THE CONTEXT OF SUMMARY DATA (ESP)

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Purpose: To evaluate the accuracy of sampling methodologies when monotonicity between two variables is required, but the parameter distributions allow the violation of this relationship when independently sampled.

Method: A dummy data set was constructed simulating the responses from 30 patients who provided utility values for a disease stage (d1) and for a more severe disease stage (d2). Monotonicity was required, with the utility for d1 (Ud1) being greater than d2 (Ud2). The mean and (95% confidence intervals) were as follows: d1 0.60 (0.56 – 0.64); d2 0.55 (0.51 – 0.59). Ten methodologies were evaluated. The mean, standard deviation, maximum and minimum values of Ud1 – Ud2 were recorded for each, having performed 1000 Monte Carlo simulations. These results were compared with samples where the covariance between d1 and d2 (cv12) was estimated from the dummy data set. The methodologies were: 1) Independent sampling from the distributions, 2) Using the same random number when sampling Ud1 and Ud2, 3) Increasing Ud1 so that

it equalled Ud2, 4) Decreasing Ud2 so that it equalled Ud1, 5) Resampling Ud1 until Ud1>Ud2 6) Resampling Ud2 until Ud2<Ud1 7) assuming that cv12 was equal to the average of the individual variances of the means (aivm), 8) assuming a value for cv12 that produced plausible confidence intervals, with cv12 > aivm, 9) as methodology 8 but with cv12< aivm and 10) assuming a plausible Beta distribution to represent the difference between Ud1 and Ud2.

Result: Methodologies 3 to 6 were biased with the mean difference being 3-6% greater than expected; the remaining methodologies had minimal error. The standard deviation of Ud1 – Ud2 varied between methods, being twenty-fold less than the expected value for methodologies 2 and 7, but conversely up to two-fold greater for methodologies 8 to 10, and four-fold higher for the remaining methodologies. Methodology 1 violated the monotonicity assumption.

Conclusion: When presented with summary data and with a belief that monotonicity must apply, a judicious selection of the covariance parameter or of the distribution for the difference appears appropriate. The former strategy is likely to be preferential if the monotonicity assumption is required for more than two parameters.

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35. TEST THRESHOLDS FOR OBTAINING PEDIATRIC NEUROIMAGING IN CLINICAL PRACTICE GUIDELINES (ESP)

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Purpose: We sought to determine how often clinical practice guidelines related to pediatric neuroimaging included information about test thresholds, and to determine the level of those thresholds.

Methods: Current guidelines related to pediatric neuroimaging identified through the National Guideline Clearinghouse, Medline, and websites of relevant professional societies were reviewed to identify those with explicit test thresholds, and those from which we were able to infer implicit test thresholds. Implicit thresholds were determined when a guideline contained the pre-test probability, or risk of a condition, in a given patient population as well as a recommendation about whether neuroimaging was appropriate in that population. If the recommendation was to perform neuroimaging, the implicit test threshold was considered to be at or below the pre-test probability in the population. If the guideline recommended against performing neuroimaging the implicit test threshold was considered to be somewhere above the pre-test probability. For the purposes of this analysis, weak or optional recommendations were considered recommendations.   Test thresholds were grouped into the following four outcome categories for comparison: any abnormality; findings that provide information regarding diagnosis or prognosis; findings that change management; and findings that require surgery. If a guideline contained recommendations pertaining to more than one outcome, an implicit threshold was determined for each outcome.

Results: None of the 32 relevant guidelines contained an explicit test threshold, and 19 (59%) contained some quantitative pre-test probability information. There were 15 (47%) guidelines with enough information to determine one or more implicit thresholds. The implicit thresholds were: any abnormality (>0.9%-1.2%, ≤30%, ≤43-80% ≤50%, ≤65.5%, ≤89%); diagnosis or prognosis (≤3.9%, ≤12%, ≤15%-20%); management (>0%, >0.18%, >1%-≤25%; ≤2%-4%; ≤3%-8%; ≤3.6%); and surgery (≤2.3%, ≤5%, ≤5%).

Conclusions: Although test thresholds are an essential aspect of evidence-based decision-making regarding diagnosis, they are not explicitly discussed in guidelines that include recommendations for pediatric neuroimaging, a class of diagnostic testing which often involves small but real risks to patients and significant costs. There is a lack of high quality evidence regarding pre-test probability of disease in populations of interest to guideline developers. Publication of explicit thresholds in guidelines might

facilitate planning of future research that could determine with confidence whether the pre-test probability of conditions is above or below the threshold for performing neuroimaging.

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36. MINIMAL MODELING APPROACHES TO VALUE OF INFORMATION ANALYSIS (ESP)

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Purpose: Value of information (VOI) techniques provide estimates of the expected benefits from clinical research studies that can inform decisions about the design and priority of those studies. Most VOI studies use decision analytic models to characterize the uncertainty of the effects of interventions on health outcomes, but the complexity of constructing such models poses barriers to some practical applications of VOI. This study explores and develops methods to perform VOI by characterizing uncertainty in health outcomes with "minimal modeling".

Methods: We first develop a conceptual framework to define and classify minimal modeling approaches to VOI. Using this framework, we then review existing VOI studies that apply minimal modeling approaches. Finally, we illustrate and discusses the application of the minimal modeling to three clinical applications to which the approaches appear well suited because clinical trials with comprehensive outcomes provide preliminary estimates of the uncertainty in outcomes.

Results: Minimal modeling approaches can be divided into "limited modeling" and "no modeling" categories. A "no modeling" approach can be applied when prior clinical studies allow charcterization of patient outcomes until any differences between treatments compared are no longer present (e.g., symptom resolution, death). This makes the measured outcomes comprehensive, in the sense that they allow alternatives being compared to be ranked in terms of their net benefit at the individual level without modeling. A "limited modeling" approach can be applied when a clinical trial describes a compenhensive measure over a defined period. However, survival (to death or symptom resolution) must be modeled separately in order to value the benefits of alternative treatments that can then be easily used to produce population-level VOI estimates. We found 12 published studies applying no modeling approaches to VOI and 7 applying limited modeling approaches. We describe three new applications of VOI, one using a limited modeling approach (comaprison of atypical antipsyhoctics) and two using a no modeling approach (erlotinib and gemcitabine versus gemcitabine in pancreatic cancer, and azithromycin vs. amoxicillin/clavulanate in acute bacterial sinusitis).

Conclusion: When appropriate measures of comprehensive outcomes are available, minimal modeling approaches to VOI can be readily applied to estimate the expected benefits of clinical research.

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37. SYSTEMATIC REVIEW OF THE ECONOMIC AND EPIDEMIOLOGICAL BURDEN OF BLEEDING-RELATED COMPLICATIONS IN AUSTRALIA (ESP)

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Purpose: To explore peri-operative bleeding and its relationship with patient morbidity, mortality and increased healthcare costs in Australia.

Method: The EMBASE and Medline databases were searched to identify relevant epidemiological and economic studies. To ensure pertinence of the data, only studies published between 1995–2010 were considered. Relevant studies were identified using *a priori* defined inclusion criteria relating to the patient population, setting and outcomes of interest.

Result: Forty-four studies were included in this systematic review. The incidence of significant bleeding was higher in cardiac surgery (5–16%), while hysterectomy and joint arthroplasty were associated with a lower incidence of bleeding (1.6–2.0%). The mean volume of blood loss ranged from 24–3357 mL. The volume of blood loss was lower following endoscopic and laparoscopic procedures (24–102 mL), while cardiovascular, liver and orthopaedic surgery were associated with greater blood loss (394–3357 mL). Similarly, transfusion volume was found to vary by surgical procedure. The average volume of transfusion was low during knee arthroplasty (0.35 units) compared to hemipelvectomy (7 units packed cells, 4 units fresh frozen plasma). Peri-operative transfusions were associated with an increased risk of medical complications (RR 1.3, $p<0.001$) and re-operation (RR 1.6, $p<0.001$). Pre-operative over-ordering and the inappropriate use of blood further adds to the burden of peri-operative bleeding to the healthcare system. Two studies found that between 13–37% of transfusions were inappropriate. One study reported a cross-match to transfusion ratio of 3.6, indicating that only 27% of cross-match blood was actually transfused.

Conclusion: This review has identified several areas in which peri-operative bleeding may increase the burden to the healthcare system. This includes the need for transfusions, risk of complications and higher re-operation rates. The over-ordering and inappropriate use of blood in Australia represents a costly waste of a scarce resource. This practice has been defended on the grounds that it provides a safety margin in the event of massive unexpected haemorrhages. Consequently, interventions that reliably reduce peri-operative bleeding may give clinicians the confidence to reduce over-ordering of blood products. Furthermore, strategies that decrease bleeding-related complications and the use of blood products would improve resource utilisation and the efficiency of the healthcare system in Australia.

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38. MODELLING PATIENTS' PSYCHOLOGICAL CHARACTERISTICS, SELF-CARE BEHAVIOURS AND CLINICAL OUTCOMES TO INFORM A PATIENT-LEVEL SIMULATION MODEL OF DIABETES (ESP)

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Purpose: To establish methods to incorporate human behaviour modelling into a healthcare simulation model of diabetes and examine what value is added to the results of a cost-effectiveness analysis by including psychological and behavioural predictors.

Method: The behavioural modelling was informed by questionnaire data collected as part of the National Institute for Health Research programme on the Dose Adjustment For Normal Eating (DAFNE) diabetes educational intervention. Psychological, clinical and demographic data were collected from DAFNE patients at baseline and at 3-, 6- and 12-month follow-up. Statistical methods were developed to investigate whether specific patient characteristics predict those who do well or poorly after attending the DAFNE educational intervention. Structural equation modelling (SEM) was used to investigate the causal links between psychological variables and the key outcome variable (HbA1c) over the first 6 months. Piecewise growth modelling (PGM) was used to analyse the nonlinear change in HbA1c over the 12-month follow-up period. PGM allowed estimation of mean rates of change and patient-level variability in change and exploration of key correlates of change. The results of the behavioural modelling are embedded within a patient-level

simulation model of the long-term progression of type 1 diabetes and the cost-effectiveness of DAFNE. The simulation model uses annual risk of developing diabetic complications to predict mortality, morbidity, costs and quality-adjusted life-years. Patient-level risks are estimated from a number of predictive clinical and demographic factors with HbA1c as the key driver of the model. The integrated framework of behavioural and cost-effectiveness modelling is used to explore the relationship between heterogeneity in patients' behavioural responses to DAFNE and the cost-effectiveness of the DAFNE intervention.

Result: Initial results from SEM and PGM analyses suggest a number of factors which differentially affect change in HbA1c over time. We present a comparison of the cost-effectiveness of DAFNE treatment for a number of subgroups defined both in terms of baseline HbA1c and psychological covariates.

Conclusion: The framework appears to be successful in integrating behavioural and clinical outcomes to inform the cost-effectiveness model. The benefits and barriers to incorporating variability in patients' behavioural response to treatment into a cost-effectiveness model are highlighted. Finally we discuss the implications of this study for selection of variables and sample size required for future studies integrating psychological, clinical and cost-effectiveness data.

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39. CHARACTERIZING THE UTILIZATION OF MAGNETOENCEPHALOGRAPHY IN THE DETERMINATION OF SURGICAL CANDIDACY IN CHILDREN AND ADOLESCENTS WITH MEDICALLY REFRACTORY EPILEPSY – A FIELD EVALUATION TO INFORM HEALTH POLICY (ESP)

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Purpose: In response to a recommendation made by the Ontario Health Technology Advisory Committee (OHTAC), the purpose of this study was to examine the utilization of magnetoencephalography (MEG), which provides high-resolution recordings of cortical function and dysfunction, in the determination of surgical candidacy for children and adolescents with medically refractory epilepsy.

Method: A retrospective chart review of all children and adolescents referred to the Epilepsy Monitoring Unit for prolonged elective video electroencephalography (VEEG) at the Hospital for Sick Children between April 1, 2004 and March 31, 2006 was conducted. Data was abstracted from the medical records regarding referral patterns, frequency and wait times of diagnostic tests, physician visits, multidisciplinary seizure conferences, timing of surgical candidacy decisions and subsequent surgical interventions and associated health care resource utilization.

Result: Of the 463 referrals identified during the study period, 349 (75.4%) received prolonged VEEG. Normalized referral patterns identified higher referral rates from northern/central areas of the province (46 to 60 referrals/1,000,000 population) where VEEG is not available. Further evaluation for surgical candidacy in 160 (34.6%) patients identified 64 (13.8%) surgical candidates. The median diagnostic test wait times for the majority of assessments was 100 days or more which contributed to a median time to surgical candidacy decision of 9 months. In surgical candidates, MEG supported the surgical candidacy decision in the majority of patients (N=59; 91%) and 32 patients (54.2%) did not require invasive electroencephalography prior to surgery. In the non-surgical candidates (N=96; 20.7%) MEG supported the decision not to proceed to

surgery in 40 (41.7%) of patients. Use of MEG prior to initial multidisciplinary seizure conference resulted in a shorter time to surgical candidacy decision (median = 193 days, N=41) as compared to later use of MEG following first conference (median = 482 days, N=18).

Conclusion: The characterization of the use of MEG to provide evidence to inform policy decision making resulted in the identification of other healthcare resource and waiting time issues. The evaluation of diagnostic medical technologies along with their utilization within the healthcare system can result in the identification of additional system related problems that can be addressed. The results of the study identified system inefficiencies, a need for coordinated care/services and standardization, and as a result, a provincial-wide epilepsy care program is under development.

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40. INFLUENCE OF FINANCING AND PAYMENT MECHANISMS ON MEDICAL DECISION MAKING: NORMAL DELIVERY VS. CESAREAN SECTION (ESP)

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Purpose: To explore if increasing rate of Cesarean sections (CS) is motivated by higher reimbursement to hospitals and to providers for CS than for normal delivery, which was introduced in 2008 with the new system of public financing for obstetric care in Armenia.

Method: The study included a comprehensive desk review and hospital based cost accounting, which estimated the mean cost of CS and normal delivery from provider perspective and compared the ratio of these costs with the ratio of reimbursement. The study collected cost related data through mother and child hospital record review and self-administered questionnaires for providers.

Result: The number of CSs significantly increased from 6.4% of all births in 2000 to 14.3% in 2007, and to 18.6% in 2010 in Armenia; the current numbers are exceeding the 10-15% that could be medically necessary according to the World Health Organization. The situation is of particular concern in maternity hospitals in the capital city Yerevan, where the CSs rate increased from 18% to 24% in the last 3 years. Our findings indicated that health providers had financial motivation to perform more CSs. Facilities receive about 1.7 times higher reimbursement for CS than for normal delivery from the government and this is in line with the ratio of the real costs. However, providers received up to 20 times higher bonus payment per CS than per normal delivery, which is significantly higher than the ratio of the real costs.

Conclusion: When making decisions on improvement of financing and payment mechanisms the policy makers should always keep in mind the influence of these changes on the medical decision making for obstetric services. Therefore, to improve efficiency and quality of the obstetric services that will eventually improve maternal and infant health, the Government of Armenia would need to reconsider particularly the provider payment mechanism introduced in 2008.

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41. HYPERTENSION ASSOCIATED MEDICATION EXPENDITURE AMONG ADULTS IN THE UNITED STATES (ESP)

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Purpose: To estimate how much the presence of hypertension adds to the annual per capita and total medication expenditure among US adults.

Method: The study sample included 21,782 civilian non-institutionalized persons aged 18 years and older from the 2007 Medical Expenditure Panel Survey. Hypertension was defined as having a diagnosis of high blood pressure (excluding pregnancy) or taking blood pressure medications. We used a two-part model to examine all-cause medication expenditure associated with hypertension. A Logit model was used to predict the probability of incurring any medication expenditure. Then, a Generalized Linear Model was used to predict the amount of medication expenditure for those who incurred any. The estimated partial effects were averaged over the distribution to achieve a population-averaged interpretation.

Result: Hypertension prevalence was 32%. Overall, 67.9% of adults were taking prescribed medications; the proportion was higher among hypertensive (93.2%) compared to normotensive adults (55.7%) (*P*<.001). After controlling for demographic and socioeconomic characteristics, hypertensive adults were more likely to have medication expenditures than normotensive adults (OR: 6.42; *P*<.001). Among hypertensive adults, those 45 years and older were more likely to incur medication expenditure than those 18-44 years (45-64 years OR=3.00, *P*<.001; and ≥65 years OR=5.95, *P*<.001). Women were more likely than men to have medication spending (OR=2.91, *P*<.001). Hispanics were less likely than non-Hispanic whites to have medication spending (OR=0.51, *P*<.001). Medication costs increased significantly among hypertensive adults. Among adults taking medications, the average cost was $1,510 higher among hypertensive adults ($2,337) compared to normotensive adults ($827). Women had a larger cost difference between hypertensive and normotensive adults ($1, 652) than men ($1,336). The medication costs among hypertensive adults increased for each successive age group, $1,045 for those aged 18 – 44 years, $2,136 for those aged 45 – 64 years, and to $2,720 for those 65 years or older. The per capita difference in medication expenditures between hypertensive ($2,166) and normotensive ($464) adults increased after including their probabilities of incurring medication spending. Medication expenditure would be $68 billion lower if hypertensive patients did not have hypertension.

Conclusion: The presence of hypertension increased the all-cause medication expenditure substantially. Further research on cost-effective interventions is needed to reduce the prevalence of hypertension and increase control of hypertension among adults.

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42. COST-EFFECTIVENESS OF A HYPERTENSION CONTROL INTERVENTION IN THREE CHINESE COMMUNITY HEALTH CENTERS (ESP)

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Purpose: To investigate the cost effectiveness of a hypertension control program in China.

Method: We collected information on program costs (categorized into personnel, variable, and fixed costs) and health outcomes (changes in systolic and diastolic blood pressure [SBP and DBP]) by conducting face-to-face interviews and physical examinations in three community health centers in China's Beijing, Hezhou, and Chengdu cities during September 2008 to August 2009. The intervention participants were comprised of 4902 hypertensive persons (SBP≥140mmHg and/or DBP≥90 mmHg) aged 18 and older who had no serious comorbidities, physical limitations, or mental disorders. The intervention included regular in-person visits, diet/physical activity/smoking/drinking-related behavioral monitoring and education, and checking on

medication use, if applicable. We examined the per capita costs and impact of the intervention on blood pressure, and derived cost-effectiveness measures.

Result: Overall, the total program costs were 240,772 Yuan (Chinese RMB) and the per capita costs were 49 Yuan. After the one year program, on average the SBP decreased from 143 to 131 mmHg (p<0.001) and DBP decreased from 84 to 78 mmHg (p<0.001). The cost-effectiveness ratio was 4.0 Yuan per one mmHg SBP decrease and 0.5 mmHg DBP decrease. Across the three centers, the annual per capita cost ranged from 36.9 to 79.8 Yuan, SBP decreases ranged from 7.6 to 17.8 mmHg and DBP decreases ranged from 3.9 to 8.3 mmHg. The cost-effectiveness ratios ranged from 3.6 to 5.0 Yuan per person per mmHg SBP decrease and 0.5-0.6 mmHg DBP decrease. There was a large variation in per capita program costs, and average SBP and DBP changes across communities. However, the community with the highest per capita costs also had the best health outcomes improvement. Thus, the cost-effectiveness ratios did not vary greatly across communities. This may suggest 1) a positive correlation between the per capita costs and program impact; 2) differences in intervention levels; and 3) differences in health status such as baseline blood pressure measures.

Conclusion: The wide variation of per capita program costs and health outcomes across communities suggests a need to further investigate the relationship between program costs and health effects in hoping to improve cost-effectiveness of the intervention. The costs and cost-effectiveness results could be helpful to policy makers in making informed resource allocation decisions.

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43. TRANSLATION OF COMPARATIVE EFFECTIVENESS RESEARCH – A CONCEPTUAL FRAMEWORK TO GUIDE POLICY-MAKERS (ESP)

Tania P. Lourenco, MSc, PhD and *William F. Lawrence, Agency for Healthcare Research and Quality, Rockville, MD*

Purpose: Systematic reviews focusing on comparative effectiveness research are designed to be health policy relevant but barriers may exist for policy-makers to incorporate this information into decision-making and it is important to understand what policy-makers' information needs are. The literature suggests that there is a gap between what policy-makers need for decision-making and what researchers actually provide. The purpose of this study was to develop a conceptual framework that identifies domains of information that policy-makers would find of relevance for incorporation of evidence for decision-making.

Method: This was a two part study including a systematic review and a qualitative study using one to one semi-structured interviews. We conducted the systematic review of the literature to identify policy-makers' information needs. The findings of the systematic review were incorporated into an interview topic guide and policy-makers involved in coverage decisions were interviewed. Using the framework approach, the data generated were analyzed with coding of emergent themes. Findings from both parts were used to develop the conceptual framework.

Result: The systematic review and the qualitative study indicate that policy-makers' information needs varies according to the type of decision being made and topic. Six main themes were identified: (1) current situation; (2) interpretation of the evidence; (3) effect on system's efficiency; (4) relationship between outcomes and costs; (5) policy implications; and (6) Other, including elements such as information on subgroups and patient acceptability. The content of each theme and how these six themes interact with each other will be presented.

Conclusion: Results indicate that the translation of comparative effectiveness reviews can be improved by the provision of further contextual information in addition to the effectiveness data. These results are

important to understand the usefulness of comparative effectiveness reviews and how it meets policy-makers' needs in the United States.

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44. COST-EFFECTIVENESS OF PULMONARY VEIN ABLATION FOR ATRIAL FIBRILLATION IN CANADA (ESP)

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Purpose: To assess, the cost-effectiveness of pulmonary vein ablation compared to anti-arrhythmic drug (AAD) treatment for patients with paroxysmal atrial fibrillation (AF) having previously failed on an AAD in Canada.

Method: A probabilistic economic model was developed to compare two AF treatment strategies: 1) pulmonary vein ablation 2) AAD (amiodarone 200mg/day). At the end of the initial 12 month phase of the model, patients are classified as being either in normal sinus rhythm or with AF. The pooled probability of patients on AAD being in normal sinus rhythm after 12 months was estimated to be 0.26. The relative risk of being in normal sinus rhythm for patients receiving ablation compared to AAD (2.93) was estimated by pooling data from controlled randomized and non-randomized studies. The per patient ablation cost used in the model was $12,179 while the annual cost of AAD used was $433. In the long term Markov phase of the model, patients are at risk of ischemic stroke each 3 month model cycle. Increased costs, increased mortality and decreased quality of life were assinged to patients after suffering a stroke. Patients with AF were assumed to have a 1.6 times increased risk of stroke compared to patients in normal sinus rhythm. A disutility of 0.046 was applied to patients while in the AF health state during the long tore Markov model phase. These model parameters were derived from various literature sources.

Result: The model estimated that compared to the AAD strategy, ablation had $8,539 higher costs, 0.033 fewer strokes and 0.144 more QALYS over the 5 year time horizon. The incremental cost per QALY of ablation compared to AAD was estimated to be $59,194. The probability of ablation being cost effective for willingness to pay thresholds of $50,000 and $100,000 was estimated to be 0.89 and 0.90 respectively. Disutility of AF has a large impact on results. If the disutility while being in an AF health state is assumed to be 0.02 instead of 0.046, the cost per QALY of ablation became $101,083.

Conclusion: Based on current evidence, pulmonary vein ablation for treatment of AF is cost effective if decision makers willingness to pay for a QALY is $59,194 or higher. Cost-effectiveness results are sensitive to the disutility associated with AF.

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45. HOSPITAL-NURSING HOME PATIENT FLOWS DURING HURRICANE KATRINA (ESP)

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Purpose: Simulation models have been widely used to model health care providers' patient flows and capacity constraints during disasters. These models rely on assumptions about how admission and discharge

patterns change during disasters. However, there is little hard data on which to base these assumptions. We examined patient flows during Hurricane Katrina in Louisiana in 2005.

Methods: We have 100% samples of claims data from affected hospitals (n = 45) and skilled nursing facilities (n = 61) in Louisiana. Using these data, we track trends in admissions, discharges, and discharge destination.

Results: Weekly hospital admissions declined from roughly 1,500/patients/week to about 700/patients/week during Hurricane Katrina and remained depressed for the rest of the year. There was a corresponding decline in the number of discharges, but the site of discharge changed. During Hurricane Katrina, there was a large increase, from ~100/patients/week to nearly 250/patients/week discharged to other hospitals. There was a slight decline in the number of patients discharged to skilled nursing facilities. Among skilled nursing facilities, the number of admissions declined during Hurricane Katrina declined from 150/patients/week to less than 50/patients/week. The number of discharges increased from 100/patients/week to almost 300/patients/week. Most were discharged home or to other skilled nursing facilities.

Conclusion: Encouragingly, skilled nursing homes did not transfer patients to hospitals during Katrina. However, our results, which show a decline in hospital-to-skilled nursing home transfers, indicate that simulation models that assume hospitals will be able to create "surge capacity" by discharging patients to nursing homes may rely on unrealistic assumptions about patient flows.

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46. ASSOCIATION BETWEEN THE AVAILABILITY OF MEDICAL ONCOLOGISTS AND RECEIPT OF CHEMOTHERAPY (ESP)

Chun Chieh Lin, PhD, MBA and *Katherine S. Virgo, PhD, MBA, American Cancer Society, Atlanta, GA*

Purpose: To determine the association between the availability of medical oncologists within the health service area (HSA) in which the patient resides and receipt of chemotherapy treatment.

Methods: Using data from the linked Surveillance, Epidemiology, and End results (SEER) – Medicare database, we identified patients diagnosed with TNM stage III or IV colon cancer during 2000 to 2005 who survived six months or more and underwent cancer-directed surgery within three months of diagnosis and initiated chemotherapy within three months after surgery. Medical oncologists were identified by physician specialty code. HSAs were geographic areas where medical resources were distributed and used based on the analysis of travel patterns between counties for routine hospital care. Multivariate logistic regression was used to investigate the association between the availability of medical oncologists and receipt of chemotherapy after adjusting for clinical and patient characteristics.

Results: Among 11,808 patients, 7.57% of them resided in a HSA with no medical oncologists; 14.22% with one to three oncologists; 18.67% with four to eight oncologists; 59.54% with nine or more oncologists. 7,274(61.6%) received chemotherapy after cancer-directed surgery. Residing in a HSA with four or more medical oncologists was associated with an increased likelihood of receiving chemotherapy after surgery compared to areas with no medical oncologists (4-8 oncologists: OR=1.291, p<.01; 9+ oncologists: OR=1.283, p<.01). Patients who were older than 70 years (p<.0001), African American (p<.001), currently not married (p<.0001), dually eligible for Medicare and Medicaid (p<.0001), with more comorbid conditions (p<.0001), and diagnosed in year 2005 (p<.01) had a decreased likelihood of receiving chemotherapy after surgery. Residing in the Northeast or South was associated with an increased likelihood of receiving chemotherapy versus residing in the West (p=.01 and p=.03, respectively).

Conclusions: The availability of four or more medical oncologists within the HSA in which the patient resides was associated with greater access to chemotherapy after surgery. Appropriate interventions to increase accessibility to chemotherapy include educational outreach efforts to primary care physicians in HSAs with three or less medical oncologists to strengthen referral networks or transportation assistance for patients.

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47. ONLINE RESOURCES FOR CANCER CARE: A QUALITY ASSESSMENT OF EVIDENCE-BASED GUIDELINES AND PROTOCOLS (ESP)

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Purpose: Online systems are being used increasingly in medicine to disseminate practice-related resources including clinical guidelines and treatment protocols. Despite their widespread use, the quality of these online resources has not been evaluated. This study addresses this gap in the area of medical oncology. Specifically, we evaluated web-based oncology resources developed across a number of health care settings internationally, using a psychometrically robust and highly utilized evaluation tool.

Methods: The Appraisal of Guidelines for Research and Evaluation (AGREE-II) instrument was used to assess the quality of breast cancer and sarcoma guidelines and protocols according to six independent domains: Scope and Purpose, Stakeholder Involvement, Rigour of Development, Clarity of Presentation, Applicability, Editorial Independence, and a general question rating overall quality. Three independent appraisers rated a total of 11 guidelines and 10 protocols from 8 websites developed for health care settings in North America, the United Kingdom, Europe and Australia.

Results: Mean quality scores across domains were highly variable, ranging from 29-73% for guidelines and 31-71% for protocols. Guidelines scored highly in terms of articulating their scope and purpose (72.6±11.2%) but scored poorly with respect to their applicability in clinical practice (29.0±17.3%). Cancer Care Ontario (CCO) and National Institute of Clinical Excellence (NICE) guidelines achieved the highest scores across most domains. Protocols scored highly on clarity of presentation (70.6±17.6%) but poorly in terms of the processes used to synthesize the underlying evidence and formulating and updating recommendations (30.8±20.0%). CCO and eviQ protocols achieved the highest scores across most domains. We did not find any differences in the quality of breast versus sarcoma guidelines/protocols and a basic navigability assessment revealed that resources were generally easy to locate.

Conclusions: Overall, the quality of resources was modest and most websites fared well in relation to factors associated with successful uptake of computerized clinical support tools by clinicians. Our evaluation provides a quick reference tool for clinicians about the strengths and limitations of oncology resources across several major websites. Further, it supports resource developers in terms of where to direct efforts to enhance guideline and protocol development processes or the way in which they communicate these processes to end-users.

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48. LANDSCAPE OF BIOLOGIC FORMULARY MANAGEMENT AND PATIENT ACCESS IN PSORIASIS (ESP)

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Purpose: Health plans may use a variety of strategies to manage the costs of biologics used in the treatment of psoriasis (PsO). Other factors, in addition to the biologic cost, may impact treatment access from the patient's perspective. The purpose of this study was to describe health plan formulary management strategies for biologics used in PsO and to evaluate the types of costs associated with filling biologic prescriptions, from the patient perspective.

Method: Data were generated from the United States WPAI Recontact Study, administered to an Internet panel of self-identified PsO patients (aged ≥18 yrs), February-March 2009 and May-June 2010. Health insurance type, benefit design, and types of costs associated with filling biologic drugs used for PsO were collected.

Result: A total of 498 PsO patients (mean age=46 years; 57% female). The majority of patients (90%) reported currently having health insurance. The top three types of health insurance were identified by patients as employer-paid (44%), managed care (34%), and health maintenance organization (21%). Of those patients with current health insurance (n=449), 96% reported having PsO prescription medication coverage and 39% needed a referral to see a specialist. Co-pay or co-insurance was required for 93% of patients. Of all PsO patients, 135 were biologic users (96% reported having health insurance). Of biologic users, injectable/intravenous PsO medication coverage was reported as follows: 32% had coverage with higher co-pay, 28% had coverage with same co-pay as other medications, and 18% had coverage of the total expense. The patient cost of the biologic prevented 24% of biologic users from filling the medication at some point. The most frequently reported ancillary costs (beyond the cost of the biologic) associated with filling the biologic, from the patient perspective, were multiple visits to health care providers (36%), number of refills (28%), multiple visits to pharmacy (24%), and gas/tolls (18%).

Conclusion: The majority of PsO patients in the United States have health insurance with PsO medication coverage. Co-pay and co-insurance were common features of these health plan benefit designs. Patients considered other economic aspects, such as frequency of refills and visits to health care providers/pharmacy, as being associated with filling biologic prescriptions.

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49. CONSEQUENCES OF WITHDRAWING THE SECOND TUMOUR NECROSIS FACTOR &ALPHA; ANTAGONIST IN SEQUENTIAL TREATMENTS OF ACTIVE ANKYLOSING SPONDYLITIS: A HEALTH-ECONOMICAL PERSPECTIVE USING A POPULATION DYNAMICS SIMULATION MODEL (ESP)

An Tran-Duy, PhD, *Maastricht University, Maastricht, Netherlands, Annelies Boonen, PhD, Maastricht University Medical Center, Maastricht, Netherlands and Johan L. Severens, PhD, Erasmus University Rotterdam, Rotterdam, Netherlands*

Purpose: Ankylosing spondylitis (AS) patients with inadequate response to the first tumour necrosis factor-alpha antagonist (anti-TNF) are treated with a second one in clinical practice. However, the second anti-TNF was shown to have somewhat lower efficacy. Considering high costs of anti-TNF therapies, the objectives of this study were to (1) develop a model that can quantify cost-of-illness and effectiveness of sequential treatments of AS with anti-TNFs for a specific society taking population dynamics into account, and (2) analyze the simulation outcomes for the Dutch society from scenarios with and without withdrawing the second anti-TNF.

Methods: Dynamics of the AS population are characterized by temporal changes in the population size and patients' attributes, including age, gender, symptom duration, work status, disease activity (BASDAI) and function (BASFI). Let *1JanX* denote the first of January of year X, PP_X denote the AS population on *1JanX*, and IP_X denote the incident AS population within a one-year period from *1JanX* to *1Jan(X+1)*. Given a

simulation length of *n* years starting from *1JanY*, the model tracks individually all AS patients appearing during this period, including (1) PP_Y, and (2) IP_Y, IP_{Y+1}, ..., IP_{Y+n-1}. For each population, the model creates a number of virtual AS patients equalling the population size, simulates disease progression of each patient and generates data on patient attributes, cumulative costs and effectiveness at discrete time points using a discrete event simulation approach. The model was parameterized using the Dutch cohort data. Two scenarios were simulated for the period *1Jan2012-1Jan2032*. In Scenario 1, five nonsteroidal anti-inflammatory drugs (NSAIDs) and one anti-TNF were available. In Scenario 2, five NSAIDs and two anti-TNFs were available. The model was developed using the Delphi and R languages.

Results: Mean BASDAI in Scenario 1 slightly increased with increasing time and in Scenario 2 was almost constant. Means of BASFI followed the same trend with differences between the two scenarios increased with increasing time (Figure 1). Saved costs per QALY lost in Scenario 1 compared to Scenario 2 on *1Jan2022* and *1Jan2032* were €86980 and €75683, respectively.

Conclusions: Decision on withdrawing one anti-TNF should be based on the willingness to accept a loss of one QALY to save about €80000. The modelling framework is novel and flexible, which can be used for different societies.
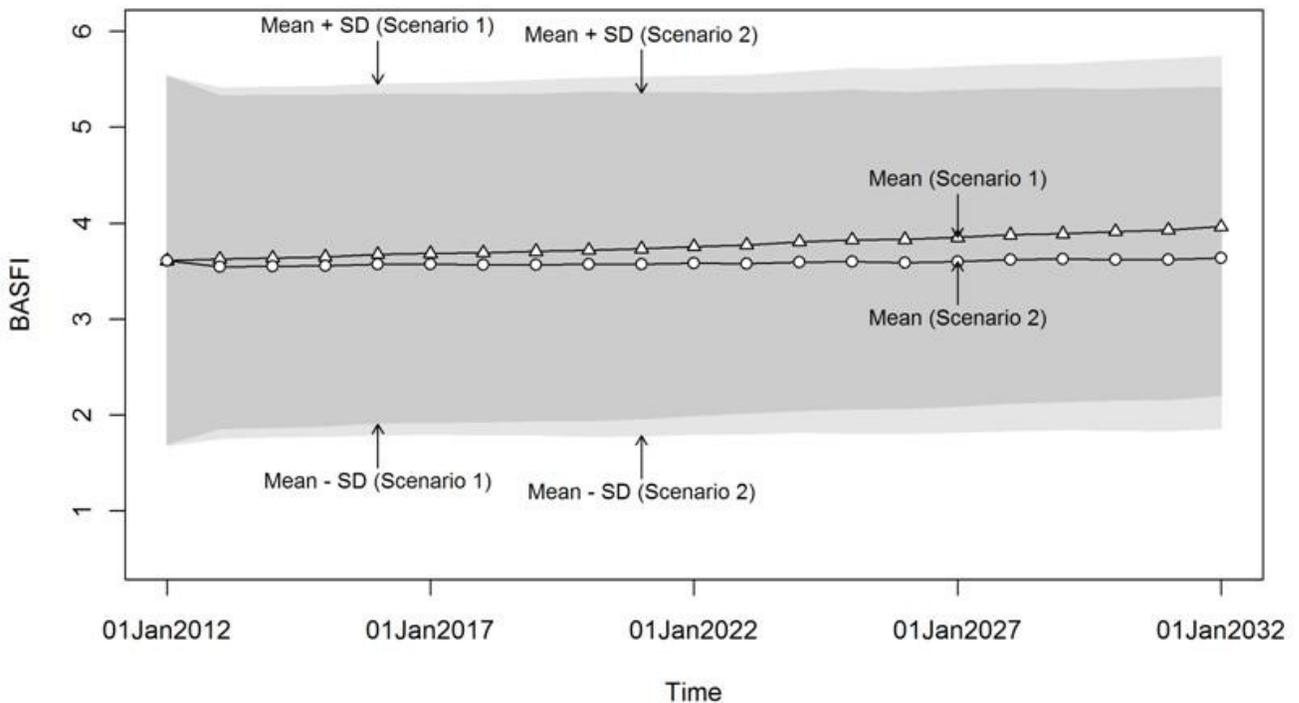

Figure 1

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50. LONGITUDINAL ANALYSIS OF GOLIMUMAB UTILIZATION: EVIDENCE FROM THE WOLTERS KLUWER SOURCE®LX NATIONAL HEALTH CLAIMS DATABASE (ESP)

Susan C. Bolge[1], Lorie Ellis[1], Amy Ryan[2], Sara Haas[2], Candace Gunnarsson[2] and Neeta Tandon[1], (1)Centocor Ortho Biotech Services, LLC, Horsham, PA, (2)S2 Statistical Solutions, Inc., Cincinnati, OH

Purpose: Golimumab (GLM) is a once monthly subcutaneous fully human anti-tumor necrosis factor treatment for rheumatoid arthritis (RA), ankylosing spondylitis (AS), and psoriatic arthritis (PsA). The purpose of this study was to report GLM utilization patterns in a large retrospective U.S. healthcare claims database.

Method: This study measured longitudinal GLM dosing patterns in adult patients with GLM prescriptions between 4/24/2009 and 12/31/2010, at least one diagnosis of interest (RA, PsA or AS) and continuous activity in the Source® LX database (≥6 months pre; ≥6 months post GLM initiation). Eligible patients had at least 6 GLM fills recorded. The proportion of fills with a 28-31 day supply of 50 mg or 100 mg GLM was determined and confirmed by plan paid cost fields. The GLM dosing interval (days) was defined as the difference between consecutive fill dates.

Result: A total of 794 patients were studied. The sample was predominantly female (76%); had rheumatoid arthritis (RA; 76%; n=607) and mean age of 52.5 years. Approximately 56% of patients had used biologics prior to GLM initiation (bio-experienced) while 44% had no history of biologic use before initiating GLM (bio-naïve). A 50 mg dose was observed in 97.7% of fills. Overall, median dosing interval was 30 days and mean was 33.9 days. Dosing intervals were similar among bio-naïve patients and bio-experienced patients. The average plan paid cost per GLM fill was $1,601.88.

Conclusion: In this longitudinal study of GLM utilization in a U.S.healthcare claims database, three quarters of GLM users had a diagnosis of RA and more than half of GLM users had prior treatment with biologic therapies. The majority of GLM fills were 50 mg with a median refill interval of every 30 days. Golimumab dosing patterns in bio-naïve and bio-experienced patients were similar. Assuming an average plan-paid cost per fill of $1,601.88, average annual golimumab therapy costs in this population would be $19,223.

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51. DOES PQRI MAKE A DIFFERENCE? (ESP)

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Purpose: To compare quality measure reporting and actual quality measure values before and after the Medicare Physician Quality Reporting Initiative (PQRI) was implemented at the University of Nebraska Medical Center (UNMC).

Methods: The Centers for Medicare and Medicaid Services (CMS) launched PQRI on July 1, 2007. The premise was that if physicians were required to report certain clinical measures for various diseases, this would improve health care. Of the 216 such quality measures which may be reported, the Divisions of General Internal Medicine (GIM) and Diabetes Endocrinology Metabolism (DEM), and the Department of Family Medicine (FM) chose to report on the osteoporosis quality measure (bone density scan), and the diabetes quality measures (HbA1c, blood pressure and LDL cholesterol). We obtained informed consent from clinicians to extract their billing data from our computerized medical record. Data extracted included the number of PQRI-eligible patients seen, the frequency that providers reported PQRI measures and the actual values of the measures. This information was collected from the time that PQRI was implemented up to the time of analysis (three years), and for an equal time prior to PQRI reporting. We report the results of the diabetes measure LDL at this time.

Result: 45 clinicians provided informed consent for extraction of their billing data for the study. The graph below shows the frequency that LDL cholesterol levels were tested for PQRI-eligible patients before initiation of PQRI and after.

Count of LDL tested
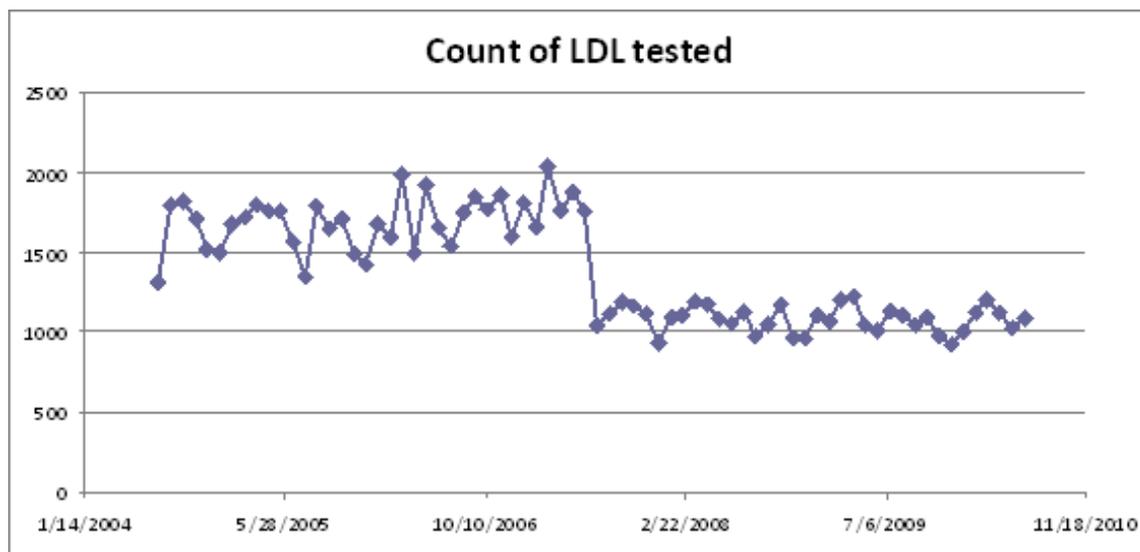
We compared the actual LDL value before and after PQRI implementation using generalized estimating equations. The average LDL level was 93.2 mg/dL for patients seen before July 2007, as compared with average LDL of 91.0 mg/dL for patients seen after July 2007 (p < 0.01).

Conclusion: We observed a difference in reporting the PQRI measure LDL for patients with diabetes. Ordering frequency of LDL decreased with implementation of PQRI. The overall number of patient visits did not decrease over the same time period. We did not identify another explanation for such an abrupt decrease in LDL testing. We also found that the average LDL level decreased with PQRI implementation. While this difference was statistically significant, it did not represent a clinically significant change.

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52. WITHDRAWN - AN ASSESSMENT OF THE MODIFIED RANKIN SCALE AS A STROKE OUTCOME MEASURE IN ECONOMIC ANALYSES OF ACUTE ISCHEMIC STROKE OUTCOMES (ESP)

Kirsteen R. Burton, MBA, MSc, MD, University of Toronto, Toronto, ON, Canada and Dorcas E. Beaton, PhD, St. Michael's Hospital, Toronto, ON, Canada

Purpose: an effective measurement tool is required to assess the economic effects of acute ischemic stroke (AIS) imaging interventions and to determine how the magnitude of AIS-attributable impairment changes over time so that these may be incorporated into economic analyses. The modified Rankin scale (mRS) is the most prevalently used measure of AIS outcomes however it has generated skepticism, concern and confusion regarding the results of stroke outcome studies. This study assesses all clinimetric properties of the mRS and outlines improvement opportunities.

Method: the mRS was analyzed using a set of clinimetric assessment instruments including the Bombardier sensibility assessment tool and Beaton responsiveness guidelines. Each clinimetric domain was evaluated, namely, measure development; item generation; measure administration; sensibility; reliability; validity; and responsiveness.

Result: the mRS displayed many shortcomings including: 1) vague definition of concept measured; 2) lack of item generation rigor; 3) compromised face validity; 4) no evidence of validity and reliability among AIS patients; 5) inadequate study of responsiveness due to arbitrary choices of clinically important differences for comparison scales.

Conclusion: the mRS is a flawed instrument for estimating AIS outcomes. Minimally, high quality, adequately powered *de novo* assessments of its validity, reliability and responsiveness should be undertaken. Preferably, a new AIS outcome measure to measure should be developed by following the detailed recommendations within each of the clinimetric properties sections of this assessment. This ideal AIS outcome measure could be applied to AIS outcome studies resulting in a facilitation, rather than obfuscation, of efforts to reduce the burden

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53. DATA ANALYSIS WITH LARGE NUMBERS OF MISSING BODY MASS INDEX VALUES (ESP)

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Purpose: Missing data present a challenge for analysis, particularly data from clinical databases and patient registries where missing values are not easily obtained after the initial data collection, or cannot be obtained at all. Additionally, there is the issue of whether data are at least missing at random (MAR) and the implications for imputing missing values. In this study, we assess the relationship between cardiovascular (CV) events, chronic kidney disease (CKD) and obesity. Specifically, we investigated the impact of missing body mass index (BMI) values in a clinical database of 36,000 patients with nearly 600,000 observations over a 10+ year period.

Method: Parametric regression models, latent growth curve modeling and hierarchical Poisson regression, were used to assess whether a longitudinal decline in kidney function modifies the association between obesity and cardiovascular events. Because the parametric models excluded patients with missing data, time series of CV events, BMI and glomerular filtration rate (GFR), were constructed by averaging values in 30-day increments and comparing the CV event series with those of GFR and BMI using cross-correlation analysis and Granger causality tests.

Result: Over 99% of the CV events were excluded from the growth curve modeling analysis because of missing BMI values. Poisson models of CV events as a function of BMI at various levels of GFR included from 17% of CV events to 66% because of missing BMI values. The time series analysis showed a significant, positive relationship between CV events and BMI for normal kidney function patients, but no significant relationship for abnormal kidney function patients.

Conclusion: BMI is a function of height and weight, so missing values for either one will limit the data available for analysis. Results from the parametric are suspect at best because of the large number of missing values. Creating and analyzing time series makes use of all available data without resorting to imputing missing values. However, time series analysis ignores the within-subject nature of these data which the parametric analyses account for.

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54. STEPS TO UTILIZATION OF NEW METHODOLOGICAL INSIGHTS IN POLICY DECISIONS (ESP)

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Purpose: This joint presentation of the Netherlands Organization for Health Research and Development (ZonMw) and the Netherlands Healthcare Insurance Board (CVZ) introduces the support structures for HTA-

methodology development in the country and ways to foster the uptake of research findings in policy decisions and guidelines. The policy context in which research findings should be used is described and the relation between the Insurance Board, the Health Care Efficiency Research Program and the Ministry of Health are clarified.

Method: Methodology for efficiency studies in the context of especially the Dutch high-cost medicines policy is urgently needed so that decisions on reimbursement of costs can be substantiated in a valid and reliable way. ZonMw stimulates research leading to the development or optimalisation of HTA-methodology that is used as an instrument in efficiency research on health care interventions. Subsidy is only granted in case the research leads to results or a methodology that in the end can be used by health policy makers in deciding on the reimbursement of health care interventions.

Result: In this joint presentation we focus on insurance package management, selection and prioritization of methodological topics. Results and implementation strategy of the ZonMw HTA-methodology efficiency program will be presented. Through presentation of health technology assessments of selected diseases and their treatments the methodological flaws and studies needed to optimize the assessment are described and critically evaluated. Information from HTA-methodology research for optimizing information gathering and synthesis is systematically combined with information from policy and practice. The health insurance board CVZ reflects on what the methodological findings may mean to them and how these new insights may be important to reimbursement decisions, in particular to upcoming decisions regarding coverage with evidence.

Conclusion: Contextualised recommendations for optimizing the interactive processes between research, policy and practice and the utilization of methodological assessments products nationally and internationally are described.

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55. DEVELOPING AN INTEGRATED RESEARCH PROGRAMME TO EXPLORE PATIENT BEHAVIOUR, CLINICAL OUTCOMES AND HEALTH ECONOMICS IN TYPE 1 DIABETES (ESP)

*Alan Brennan, BSc, MSc, PhD, Jen Kruger, BSc, Simon Heller, BA, MB, BChir, DM, FRCP and **Praveen Thokala, PhD**, University of Sheffield, Sheffield, United Kingdom*

Purpose: To describe the development of a five year research programme and discuss key lessons learned over the first half of the programme.

Method: A multi-disciplinary team incorporating physicians, diabetic nurses and educators, psychologists, clinical trialists, statisticians, and health economic modellers combined to develop an integrated five year research programme investigating the education programme Dose Adjustment For Normal Eating (DAFNE). A previous randomised controlled trial (RCT) of DAFNE showed some benefits overall but a heterogeneous response amongst patients undertaking the five day course, leading to a series of policy questions concerning who should receive the educational intervention, whether the intervention should be redesigned in some way, and how those who do not respond as successfully can be best supported in their ongoing self management.

Result: The UK National Institute for Health Research has funded the programme which consists of the following key elements:

- A multi-centre observational study of approximately n=1,100 recruiting over 2 to 3 years from education programs nationally to measure clinical data, resource use, disease specific (DSQoL) and generic (SF12 and EQ5D) quality of life measures at baseline and 12-month follow-up.

- A quantitative psychosocial study of n=262 course participants, measuring psychological (self-efficacy, self-care etc.), behavioural, clinical and demographic data at baseline and 3-, 6- and 12-month follow-up.
- A qualitative psychosocial study involving in-depth interviews and direct observation of courses to focus on barriers and facilitators of successful adoption of DAFNE behaviours and principles.
- Design and implementation of a RCT comparing the five day course with a newly designed course offering one session per week over five weeks.
- Design of a potential additional trial comparing education alone verses education plus insulin pumps.
- Development of quantitative behavioural models based on the psychosocial study and integration of these within an patient level simulation model of long-term type 1 diabetes complications, mortality, morbidity, costs and quality-adjusted life-years.
- Planned analyses include exploring predictive power of covariates for successful adoption of behaviours, subgroup analyses, and cost-effectiveness of alternative strategies for long-term self management.

Conclusion: The integrated package of psychological, clinical trial and health economic outcomes research has been funded by the NIHR and is now in its third year. We discuss lessons on the design and implementation of the integrated framework.

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56. PSORIASIS AND PSORIATIC ARTHRITIS PATIENT PRODUCTIVITY BURDEN IN THE UNITED STATES (ESP)

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Purpose: Limited data exist describing the current productivity burden for psoriasis (PsO) or psoriatic arthritis (PsA), relative to other diseases, in the United States (U.S.). The purpose of this study was to describe the productivity burden of PsO or PsA, for patients residing in the U.S., relative to other costly diseases.

Method: Data were generated from the U.S. Work Productivity and Activity Impairment Recontact Study, administered February-March 2009 and May-June 2010. Study participants were recruited from an Internet panel, aged ≥18 yrs, employed currently or within the past 2 years, and self-identified as having physician-diagnosed atrial fibrillation (afib), neck/lower back pain (pain), PsO, PsA, or stroke. Absenteeism (% work time missed due to condition in past 7 seven days), presenteeism (% impairment while working due to condition), work productivity loss (WPL- % overall work impairment due to condition), and activity impairment (% activity impairment due to condition) were measured with the WPAI Scale. Higher scores indicated greater impact of the condition on productivity/activity. Absenteeism, presenteeism, and overall work impairment costs were calculated.

Result: A total of 1,934 patients, employed in the U.S., completed the survey (afib n=319; pain n=504; PsO n=498; PsA n=347; and stroke n=266). PsO patients had higher mean presenteeism, WPL, and activity impairment scores compared to afib patients. PsA patients had higher mean WPAI scores, across all domains, compared to patients with afib or stroke. Mean PsO absenteeism costs ($2,350) were lower than afib ($3,358), pain ($6,755), or stroke ($3,652). Mean PsA absenteeism costs ($5,748) were higher than afib or stroke. Mean PsO presenteeism costs ($9,440) were higher than afib ($5,915) or stroke ($9,004), but lower than pain ($13,181). Mean PsA presenteeism costs ($11,665) were also higher than afib or stroke. Mean PsO overall work impairment costs ($11,790) were higher than afib ($9,273) and lower than pain ($19,935) or stroke ($12,656). Mean PsA overall work impairment costs ($17,413) were higher than afib or stroke.

Conclusion: Psoriasis patients reported more of an economic presenteeism burden relative to afib or stroke. Psoriatic arthritis patients reported an increased economic productivity burden across absenteeism, presenteeism, and overall work impairment relative to afib or stroke.

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57. GOLIMUMAB BUDGET IMPACT MODEL (ESP)

Susan C. Bolge[1], Stephen L. Slabaugh[1], Andrea Szkurhan[2], Jayson Quach[2] and Neeta Tandon[1], (1)Centocor Ortho Biotech Services, LLC, Horsham, PA, (2)Dymaxium, Ltd., Toronto, ON, Canada

Purpose: Commercial managed care payers need to understand the potential financial impact of granting access to a product when making formulary decisions. Golimumab is an approved biologic therapy for treatment of rheumatoid arthritis (RA), psoriatic arthritis (PsA), and ankylosing spondylitis (AS). The purpose of this study was to estimate the potential budget impact by allowing access to golimumab in a hypothetical commercial health plan.

Method: A budget impact model, employing a third-party payer perspective and with a three year time horizon, was developed. Epidemiologic data were used to quantify the proportion of patients diagnosed with RA, PsA, or AS and currently treated with biologics. Current and forecasted market share sizes were applied for all biologic products in these indications in two scenarios: excluding golimumab and including golimumab. Pricing inputs for all biologics were based on wholesale acquisition cost (WAC) as of 04/01/2011 and 20% co-insurance covered by members. Infusion costs were computed from the 2010 Medicare Physician Fee Schedule. Adalimumab double dosing was not included in the model, and infliximab dosing was assumed to be 5mg/kg at all doses. Findings were calculated for a hypothetical plan with a population of 1,000,000 members.

Result: In a plan with 1,000,000 members, 1,991 were biologic users in the first year, 2,045 in the second year, and 2,088 in the third year. Total annual cost of treatment, total cost per member per month (PMPM), and total cost per treated member per month (TMPM) were similar for both scenarios across the three year time horizon.

Conclusion: Access to golimumab is budget neutral and does not impact the annual health care budget of a commercial health plan while adding another therapeutic option for patients. **Table:** Budget Impact of Golimumab

	Excluding Golimumab	Including Golimumab	Cost Difference	% Difference
Year 1				
Total Cost	$34.91 M	$34,90 M	-$6,705.27	-0.02%
PMPM	$2.91	$2.91	$0.00	-0.02%
TMPM	$1,461.12	$1,460.84	-$0.28	-0.02%
Year 2				
Total Cost	$35.71 M	$35.71 M	-$3,122.21	-0.01%

PMPM	$2.98	$2.98	$0.00	-0.01%
TMPM	$1,455.15	$1,455.02	-$0.13	-0.01%
Year 3				
Total Cost	$36.37 M	$36.37 M	$2,900.72	0.01%
PMPM	$3.03	$3.03	$0.00	0.01%
TMPM	$1,451.57	$1,451.68	$0.12	0.01%

58. CULTURAL VARIABILITY AMONG HISPANICS ON KNOWLEDGE OF THE HUMAN PAPILLOMAVIRUS (ESP)

Julie Kornfeld, PhD[1], **Margaret M. Byrne, PhD[1]**, *Robin Vanderpool, DrPH[2], Ian J. Bishop, BA[1] and Erin Kobetz, PhD[1], (1)University of Miami, Miami, FL, (2)University of Kentucky College of Public Health, Lexington, KY*

Purpose: To determine whether Hispanic immigrants from different geographic areas have different levels of knowledge about Human Papillomavirus (HPV).

Methods: The National Cancer Institute's former Cancer Information Service operated a Spanish language call center with trained information specialists. We partnered with CIS to collect HPV knowledge data among Spanish language, Hispanic immigrant callers. Of 2,134 callers who met study eligibility criteria, 49% (n=1045) agreed to participate. Awareness of HPV was asked of 1037 individuals. Ten questions related to HPV knowledge were asked of participants; the number of correct answers for each participant was summed and categorized into Low, Medium, and High knowledge. Demographics, country of origin, and questions on language most commonly spoken were asked.

Results: The average age of participants was 41.4 (SD 11.9) years, and 81.9% were female. The majority, 66.1%, had a high school education or less. Geographic origin was classified as Caribbean (9.3%), Central America (13.3%), Mexico (53.4%), and South America (24.0%). The majority, 56.9%, indicated that they only spoke Spanish. Among participants, 671 (64.7%) said that they had heard of HPV. Only these individuals were asked the 10 knowledge questions. For individual questions assessing HPV knowledge, the % of individuals getting the correct answer ranged from 43.2% (knowing that HPV causes genital warts) to 83.5% (knowing that having many sexual partners increases HPV risk). The average number of correct answers was 6.01 (SD 2.40), with 17.3% of participants being categorized as Low knowledge, 35.4% as Medium, and 47.2% as High. Multinomial logistic regression showed that geographic origin was not associated with knowledge level. Compared to individuals with Low knowledge levels, older individuals were less likely to have a Medium level of knowledge (RRR 0.45 [CI 0.23, 0.90]) and individuals with a college degree or more were significantly more likely to have a High level of knowledge (RRR 3.86 [CI 1.54, 9.69]). Years in the US and language primarily spoken were not associated with knowledge level.

Conclusions: Geographic origin was not associated with knowledge about HPV among Hispanic immigrants. Knowledge was generally low (just over half of questions answered correctly). This lack of knowledge might inhibit optimal and informed decision making about HPV vaccination. Examining

prevalent knowledge and attitudes of HPV can lead to more relevant, and thus sustainable, prevention activities.

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59. OB-GYNS' KNOWLEDGE AND OPINIONS ABOUT THE USPSTF 2009 BREAST CANCER SCREENING GUIDELINES AND NUMBER NEEDED TO TREAT FOR MAMMOGRAPHY SCREENING (ESP)

Britta L. Anderson, PhD and *Jay Schulkin, PhD, American College of Obstetricians and Gynecologists, WAshington, DC*

Purpose: Assess ob-gyns' opinions regarding *Screening for Breast Cancer: USPSTF Recommendation Statement* (referred to as The Statement) and number needed to treat for mammography.

Methods: A nationally-representative sample of 406 ob-gyns' who are members of the Collaborative Ambulatory Research Network (CARN), a group that agrees to participant in 4-6 survey studies each year, were surveyed in early 2010. A 59.6% response rate was obtained, 211 indicated that they provided breast care and were included in the analysis.

Results: When asked if they read The Statement in the Annals of Internal Medicine (November 2009), 19.0% had read it thoroughly, 32.7% skimmed it, 16.9% read the abstract only, 25.1% had not read it, and 5.2% had not read, but plan to (1.9% did not answer the question). 56% think the number of mammograms will decrease because of The Statement and 44% think the number will stay the same. 88.2% support the Women's Health Amendment (which provides coverage for preventive health) and 58.3% think the amendment was a necessary response to The Statement. When asked, "It is worth performing screening mammography on _____women in order to save one woman from dying from cancer," 69.1% of the sample gave a numeric answer (Range = 1 to 500,000, Mean =5,872.69 (SD = 42,251.16), Median = 500, and Mode = 1000 (32.2% of the sample)), 17.1% did not answer, and 13.8% wrote a text answer (most commonly "all" or "I don't know"). There no differences on any of these variables by age, gender, practice site (solo, group, etc), practice setting (private, university, community), or the number of 40-49 year old patients they see.

Conclusions: Ob-gyns anticipate that The Statement would decrease mammography rates. Few had fully read The Statement. There is little consensus among ob-gyns about the number needed to treat for mammography.

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60. OVERVIEW AND EVALUATION OF DECISION-ANALYTIC MODELS FOR THE TREATMENT OF CHRONIC MYELOID LEUKEMIA (ESP)

Ursula Rochau, MD[1], Ruth Schwarzer, MA, MPH, ScD[1], Gaby Sroczynski, MPH, Dr.PH[1], Beate Jahn, PhD[1], Dominik Wolf, MD, PD[2], Guenther Gastl, MD, Univ.-Prof.[2] and Uwe Siebert, MD, MPH, MSc, ScD[3], (1)UMIT - University for Health Sciences, Medical Informatics and Technology, ONCOTYROL - Center for Personalized Cancer Medicine, Hall i.T., Austria, (2)Medical University Innsbruck, Austria, Innsbruck, Austria, (3)UMIT-Univ. f Health Sciences;ONCOTYROL-Center f Personal. Cancer Med;Harvard School of Public Health;Harvard Med. School, Boston, Hall i.T., Austria

Purpose: To describe and analyze the structural and methodological approaches of published decision-analytic models evaluating various treatment strategies in chronic myeloid leukemia (CML) and to derive recommendations for future CML models with a focus on personalized medicine.

Method: We performed a systematic literature search in electronic databases (Medline/PreMedline, EconLit, EMBASE, NHS EED and Tufts CEA Registry) to identify published studies evaluating CML treatment strategies using mathematical decision models. The models were required to compare different treatment strategies and to comprise relevant clinical health outcomes (e.g., responses, progression-free survival, life-years gained or QALYs) over a defined time horizon and population. We used standardized forms for data extraction, description of study design, methodological framework, and data sources. Among other characteristics, we analyzed different modeling types and simulation techniques, endpoints, perspectives, time horizons, uncertainty analysis, model validation and personalized medicine aspects.

Result: We identified 15 different decision-analytic modeling studies. Of these, 14 included economic evaluation. The modeling approaches varied substantially and comprised decision trees, Markov cohort models, state transition models with individual (Monte Carlo) simulation, and mathematical equations. Analytic time horizons ranged from two years to lifetime. Most of the models chose the perspective of the health care system or a societal perspective. Health outcomes included (overall, median, progression-free) survival, life expectancy, and QALYs. Compared treatment strategies comprised bone marrow or peripheral blood stem cell transplantation, conventional chemotherapy, interferon-alpha, and tyrosine kinase inhibitors (TKI). Only one model evaluated a second-generation TKI (dasatinib). The majority of the models did not report a model validation. All models conducted deterministic sensitivity analyses. In addition, four models reported a probabilistic sensitivity analysis. None of the models evaluated comprehensive personalized medicine strategies.

Conclusion: We found several well-designed models for different CML treatment strategies. However, the quality of reporting varied substantially. We recommend that future models should include novel treatment options such as second-generation TKIs to assess the long-term effectiveness and cost-effectiveness of these treatment strategies, subgroup evaluations for a more personalized decision making, and validation using independent data. Already available models with a short time horizon could be updated with new survival data.

Tuesday, October 25, 2011 (Posters)

SMDM POSTER SESSION 4

2:30 PM - 4:00 PM: Tue. Oct 25, 2011
Grand Ballroom AB (Hyatt Regency Chicago)

Session Summary:

1. VIRTUAL EXPERIENCE AS A PROXY FOR NUMERACY IN PROBABILITY COMMUNICATION

2. AN IN-DEPTH REVIEW OF THE HISTORY AND USE OF THE CONTROL PREFERENCE SCALE

27. DOSE-RESPONSE RELATIONSHIP BETWEEN HOSPITAL SURGICAL VOLUME AND PATIENT SAFETY

28. DEVELOPMENT OF A COMPUTER-ADAPTIVE INSTRUMENT TO MEASURE DISABILITY IN OLDER ADULTS

29. OBESITY AND MORTALITY IN PERSONS WITH AND WITHOUT OBESITY-RELATED DISEASES: USING DATA FROM NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III

30. MATERNAL PREFERENCES FOR CESAREAN: DO WOMEN GET WHAT THEY WANT?

31. FACTORS ASSOCIATED WITH THE CHOICE OF BIOLOGIC DISEASE MODIFYING ANTI-RHEUMATIC DRUGS AMONG RHEUMATOID ARTHRITIS PATIENTS IN CALIFORNIA MEDICAID

32. A DECISION SUPPORT TOOL FOR CATEGORIZING PATIENT ACUITY AT EMERGENCY DEPARTMENT

33. EVALUATING A PROPOSED SWOG TRIAL OF BREAST CANCER TUMOR MARKERS: A VALUE OF RESEARCH AND BIOBANK ANALYSIS

34. SYSTEMS APPROACH TO DISEASE MODELING

35. BUDGETARY IMPACT OF ADDING ROFLUMILAST TO MANAGED CARE FORMULARY IN THE TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

36. FROM POLICY TO PRACTICE: PRIMARY CARE PHYSICIAN PERSPECTIVES ON VALUE AND ITS INFLUENCE ON MAKING CLINICAL DECISIONS

37. ROBUSTNESS OF COST-EFFECTIVENESS ESTIMATES FOR CINACALCET IN SECONDARY HYPERPARATHYROIDISM BASED ON THE ADVANCE TRIAL

38. USING DATA FROM SYSTEMATIC REVIEWS OR MULTIPLE SOURCES IN DECISION ANALYSES IMPACTS CONCLUSIONS

50. MULTIPLE CRITERIA DECISION ANALYSIS FOR HEALTH TECHNOLOGY ASSESSMENT

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51. PERCEPTIONS AND REALITIES OF FOOD FORTIFICATION IN PREVENTING ANEMIA

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52. PATIENT PERCEPTIONS AND EXPERIENCES WITH SITES OF CARE (SOCS) AMONG PATIENTS WITH IMMUNOLOGY CONDITIONS CURRENTLY USING INTRAVENOUS (IV) BIOLOGIC THERAPY

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53. VARIATION AMONG US STATES IN INPATIENT COST OF DIABETES-RELATED LOWER EXTREMITY AMPUTATION: IS THERE A REGIONAL PATTERN?

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54. THE POTENTIAL OF EARLY MODELING OF NEW TECHNOLOGIES TO HELP INFORM DECISION-MAKING

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55. COMPARATIVE EFFECTIVENESS OF ANTIARRHYTHMIC DRUG THERAPY IN ATRIAL FIBRILLATION: FOCUS ON CARDIOVASCULAR HOSPITALIZATION AND MORTALITY OUTCOMES

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56. SURVIVAL-BASED QUALITY OF LIFE ASSESSMENTS

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57. CAN DECISION TREE ANALYSIS BE USED TO IDENTIFY THE OPTIMAL EVENT PATHWAY TO REACH AN ACCURATE DIAGNOSIS? THE MAZE OF CARE STUDY IN OVARIAN CANCER

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58. BIOLOGIC EXPERIENCE AND SYSTEMIC MEDICATION USE AMONG COMMERCIALLY INSURED PSORIASIS PATIENTS RECEIVING USTEKINUMAB

Grand Ballroom AB (Hyatt Regency Chicago)

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1. VIRTUAL EXPERIENCE AS A PROXY FOR NUMERACY IN PROBABILITY COMMUNICATION (DEC)

Mark D. Horowitz, MS[1], *Robert B. Allen, Ph.D.*[2] *and Prudence W. Dalrymple, Ph.D.*[2], *(1)Drexel University, Ambler, PA, (2)Drexel University, Philadelphia, PA*

Purpose: Non-numerate decision makers need to know probabilities defining their decisions under uncertainty. As a substitute for numeric, verbal and graphic probability representations which are more

effective for the numerate than the non-numerate, probability is directly experienced and unconsciously constructed through a stream of user-controlled, visually mediated, binomial trials. Secondarily, the purpose is to investigate the differences in properties of experiential probability communication between the numerate and non-numerate components of the general patient population.

Method: We have developed a novel patient oriented decision aid in the form of interactive animated decision trees. The simplest of these trees are single-stage binomial chance trees which are used for the purpose of communicating know probabilities to subjects. The subjects are given control of the interface so that they may use it as long as necessary, stopping if mentally fatigued, and restarting when desired. The interface has been implemented in both an HTML-hosted Java Swing applet and an HTML5/Javascript interface. Interstep temporal varies between 250ms and 350ms. Duration of path indication in the 'on' state varies between 200ms and 300ms. Different subjects may experience identical sets of probability values to be communicated. For purposes of studying this decision aid, subjects are permitted to repeat their probability communication exercise. Each time a different pseudo-random number is calculated. Preprogrammed pseudo-random number generators guarantee sequences of unequal sequential values so that subjects cannot report the prior value as theirs. Subjects effectively become actors in an interactive, visual, Monte Carlo simulation where its direct experience is the intended method of communicating the probability values. Investigators were concerned that subjects might have been counting, rather than experiencing, success and failure outcomes and calculating, rather than intuiting, the probabilities reported. To minimize this possibility, short times between successive trials were defined. In addition, subjects were asked if they counted.

Result: Subjects (N = 14) have performed 32 trials. Correlation between input probability to communicate, and probability reported by subject is 0.92, an encouraging value. No users reported counting numbers of success and failures of trials.

Conclusion: Further work needed to determine differences between numerate and non-numerate performance. Trials are needed to determine if subjects over or underreport low and high probabilities. It is not known if experiential probability communication yields consistent results for pairs of experienced complementary values.

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2. AN IN-DEPTH REVIEW OF THE HISTORY AND USE OF THE CONTROL PREFERENCE SCALE (DEC)

Suzanne K. Linder, Ph.D., *André W. Hite Jr., B.S., M.P.H., Zubin N. Segal, M.P.H. and Robert J. Volk, PhD, The University of Texas MD Anderson Cancer Center, Houston, TX*

Purpose: We conducted an in-depth review to describe the history and use of the Control Preference Scale (CPS), the most widely used measure of patients' preferred and actual involvement in making health care decisions.

Method: We used SCOPUS to identify articles that cited one of the ten Degner CPS studies (1988 study through the 1997 validation study). After the removal of duplicates, we screened citations and full texts to include articles that were in English, involved healthcare decisions, and administered the CPS at more than one time point. For relevant studies, we abstracted study characteristics (i.e., type of decision, healthcare topic) and information related to the CPS (i.e., CPS version, type of question, type of role, Degner CPS studies cited).

Result: 35 articles met our criteria. Of the 35, the most common decision type was cancer treatment (57%), followed by cancer screening (22%), and non-cancer treatment (17%). The most common topics were breast

cancer (34%) and prostate cancer (31%). The majority of the studies used the single-item version of the CPS (86%) compared to the card sort technique (14%). About half (51%) of the studies used the CPS to measure general preferences or actual roles in health care decision-making, whereas a little over a third (37%) were focused on a specific healthcare decision. About half (48%) of the studies cited the Degner 1992 CPS study and less than half (40%) cited the 1997 validation study.

Conclusion: Most studies use a single-item version of the CPS as opposed to the original, validated card sort method. In order to compare patient involvement across different healthcare decisions, both CPS versions must be psychometrically similar. The adoption of the single-item version is concerning as its measurement properties are largely unknown. The original CPS was developed to measure cancer patient involvement in treatment decisions. However, the scale has been used to measure general and decision-specific preferences in a wide variety of healthcare contexts. Research is needed to validate the CPS for different healthcare contexts.

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3. VALUES AND PREFERENCES IMPORTANT IN CONTRACEPTIVE DECISION MAKING: A QUALITATIVE STUDY (DEC)

Tessa Madden, MD, MPH[1], Gina Secura, PhD, MPH[2], Ragini Maddipati, MSW[2] and Jeffrey Peipert, MD, PhD[2], (1)Washington University School of Medicine, Saint Louis, MO, (2)Washington University in Saint Louis, Saint Louis, MO

Purpose: To use qualitative methods to identify values and preferences contributing to contraceptive decision-making among reproductive-age women.

Method: We conducted semi-structured focus groups with reproductive-age women. We recruited participants in-person from 3 healthcare clinics providing contraceptive services and by telephone from a database of minority, low-income women who had previously agreed to be contacted for research studies. We audio-recorded all focus groups. The focus group sessions were professionally transcribed. We analyzed transcripts using qualitative data analysis software to identify themes about women's values and preferences in contraceptive decision-making. We continued focus group recruitment until thematic saturation was reached.

Results: A total of 44 women participated in 12 focus groups. Participants were racially and socioeconomically diverse; 64% were black, 43% were white; 27% were currently receiving public assistance, and 52% reported difficulty paying for basics in the past 12 months. Eighty-seven percent of participants had used one or more contraceptive methods and 33% reported at least one prior pregnancy. Table 1 shows the values and preferences identified as important by focus group participants when making decisions about contraception.

Table 1: Values and Preferences Important for Contraceptive Decision-Making	
Value/Preference	**Number of Participants** **N (%)**
Method is affordable	41 (93.2)
Method is highly effective	32 (72.7)

Method avoids irregular bleeding or heavier periods	30 (68.2)
Only have to think about method at the time of intercourse	30 (68.2)
Method is long-acting	28 (63.6)
Method provides protection against sexually transmitted infections	27 (61.4)
Do not need an appointment to start or continue method	26 (59.1)
Method provides a regular monthly period	25 (56.8)
Method is forgettable	24 (54.5)
Method avoids hormones	20 (45.5)
Nobody knows you are using the method	16 (36.4)
Method avoids an object inside the body	15 (34.1)
Method avoids risk of thromboembolism	9 (20.5)
Method does not require pelvic exam or procedure to start the method	9 (20.5)

Conclusion: Contraceptive decision-making is a complex process and there are multiple values and preferences important to women when selecting a contraceptive method. Attributes of a contraceptive method may not meet all identified values and preferences. Future research in contraceptive decision-making should investigate the role of these values and preferences and how women make trade-offs between factors when choosing a contraceptive method.

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4. WHAT DO HEALTH CARE PROVIDERS THINK ABOUT SHARED DECISION MAKING? (DEC)

Karen R. Sepucha, PhD and **Sandra Feibelmann, M.P.H.**, *Massachusetts General Hospital, Boston, MA*

Purpose: To assess primary care providers' (PCPs) and specialists' perspectives on shared decision making. Specifically, we focused on their opinions about two main factors, informing patients and discussing patients' preferences.

Method: Providers identified through the American Medical Association master file were surveyed about one of four common decisions: colon cancer screening (CRC), herniated disc (HD), menopause (Meno), or depression (Dep). We examined providers' responses to items about the extent to which they inform patients and discuss patients' preferences, their use of educational materials, and whether they differed by condition or by training (specialists vs. PCP).

Result: Overall, 436/737 (59%) of providers responded across the four topics, including 182 PCPs and 254 specialists. The respondents were on average 52 years old (SD 9.2), white (73%), male (68%), and had been

in practice 21 years (SD 9.5). Specialists had higher annual patient volume, (median 530 vs. 301) and were more likely to be white (79% vs. 70%, p=0.02) compared to PCPs. Overall, 58% of providers reported using educational materials for these conditions, with specialists reporting higher use than PCPs (73% vs. 39% p<0.001). Almost all providers felt it was very important for their patients to be informed (94% vs. 94.5%, p=.58). Specialists were more likely to report that their patients were extremely or very well informed compared to PCPs (73% vs. 47%, p=<.001). Almost all providers (93%) felt that it was extremely or very important to discuss patients' treatment preferences before a decision is made. Both specialists and PCPs report having such discussions often (98% and 93%, p=0.007). Providers' use of educational materials varied by condition (69% HD, 64% Meno, 56% CRC, 47% Dep, p=0.008). More HD and CRC providers reported their patients were extremely or very well informed (80% HD and 70% CRC vs. 53% Dep and 50% Meno, p <0.001). Fewer CRC providers thought it was important to discuss patients' preferences (98% HD, 95% Dep, 95% Meno vs. 84% CRC p <.0001).

Conclusion: Providers feel strongly about the importance of key components of shared decision making. Providers had mixed reports about how well informed their patients were, with specialists being more confident than primary care providers. Virtually all providers reported that they always discuss patients' preferences for these decisions.

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5. USAGE AND CHARACTERISTICS OF PATIENT SATISFACTION WEBSITES (DEC)

Jennifer Schneider Chafen, M.D., M.S.[1], Jason Mann, M.D., PhD.[2], Cathie Markow, MBA, RN[2], Anastasia Toles, M.D., MPH[2] and Dena M. Bravata, MD, MS[1], (1)Stanford University, Stanford, CA, (2)Castlight Health, San Francisco, CA

Purpose: Patient satisfaction survey data and physician reviews are available on the Internet. However, there is no published assessment of the information provided by these sites, relative usage of them, or principles of best practices.

Method: We performed Internet searches in February 2011 for websites that presented patient satisfaction survey data or physician reivews. We expected that high quality sites would report the total number of reviews, confirm that data were obtained from people who were patients of the physician, and have documented methodology. From each site, we systematically abstracted data on 4 characteristics: 1) general characteristics of the site (e.g. whether the site was a healthcare specific site), 2) types of providers reviewed, 3) characteristics of the population providing the reviews, and 4) characteristics of the survey/reviews data. We assessed the US Alexa Traffic Rank for each site and compared the characteristics of the five most frequently visited sites to the other sites using t-tests with Bonferroni correction.

Result: We identified 20 sites that presented patient satisfaction survey or review data for physicians. The US Alexa Traffic Rank ranged from 3 (Yahoo Local) to 398,324 (Find a Doc). Sixteen sites reported patient satisfaction survey data, 16 sites presented physician reviews, and 13 presented both. The five most frequently visited sites were less likely to report the number of total reviews (1/5 vs 4/15 p=0.38), confirm that a reviewer was an actual patient of the physician (0/5 vs 2/14 p=0.87), or have an accompanying description of their methodology (0/5 vs 2/15 p=0.73). The five most frequently visited sites were more likely to be healthcare specific (1/5 vs 4/15 p=0.94), review allied health providers in addition to physicians (4/5 vs 11/15 p=0.19), use a 5 star/point rating system (5/5 vs 8/15 p=0.67), allow the physician to respond to the review (3/5 vs 4/9 p-0.98), have an overall rating score (5/5 vs 11/14 p=0.12), and thave an associated disclaimer (5/5 vs 14/15 p=0.001). The five most frequently visited sites were less likely to allow prose reviews (4/5 vs 12/13 p=0.02).

Conclusion: Traffic to patient satisfaction survey and rating websites is high. Providers need to remain aware of their online reputations. It is concerning that the most highly visited sites do not meet even relatively low quality thresholds.

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6. AWARENESS OF DYING; IT NEEDS WORDS (DEC)

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Purpose: Being aware that death is imminent is often seen as a feature of a good death. A prerequisite for awareness of dying is open communication between all parties involved in the dying phase. We studied to what extent dying patients are aware of the imminence of death, whether such awareness is associated with patient characteristics, symptoms and acceptance of dying, and if medical records and nurses' and family caregivers' views on patients' awareness of dying agree.

Method: Nurses and family caregivers of 475 deceased patients from three different care settings (hospitals, nursing homes and home care services) in the southwest-Netherlands were requested to fill out questionnaires. Both groups were asked whether a patient had been aware of their imminent death. In addition, medical records were screened for information indicating whether or not the patient was aware of the dying phase . Associations with awareness were assessed using chi-square tests. The level of agreement on patients' awareness of dying between medical record, nurse and family caregiver was assessed using Cohen's Kappa.

Result: In total, 472 nurses (response 99%) participated. Of the relatives 280 consented and completed a questionnaire (response 59%). According to the medical records, 51% of patients had been aware of the imminence of death; according to nurses, 58% and according to family caregivers, 62%. Patients who, according to their family caregiver, were aware of their imminent death were significantly more often in peace with dying and felt more often that life had been worth living, compared to patients who were not aware . The level of inter-rater agreement on patients' awareness of dying was fair (Cohen's Kappa= 0,23-0,31).

Conclusion: Being aware of dying is associated with acceptance of dying, which supports the idea that open communication in the dying phase between physicians, nurses, patients and family caregivers can contribute to the quality of the dying process. Communication about all potentially relevant aspects of the situation of a patient in the dying phase is a requirement for adequate patient-centered care. However, views on whether or not patients are aware of their imminent death diverge between different caregivers. This suggests that communication in the dying phase of patients is open for improvement.

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7. DISCRETE CHOICE VERSUS CONSTANT SUM PAIRED COMPARISONS FOR ELICITING SOCIETAL PREFERENCES FOR HEALTHCARE RESOURCE ALLOCATION (DEC)

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Purpose: To pilot test discrete choice experiment (DCE) and constant sum paired comparison (CSPC) online questionnaires for eliciting societal preferences for the allocation of healthcare resources.

Method: Respondents were asked to allocate a fixed budget between two patient groups, described by attributes including age, health and life expectancy with/without treatment, the number of patients and potential quality-adjusted life years (QALYs) gained. The DCE asked respondents to allocate the entire budget to their preferred group, while the CSPC asked respondents to allocate budget percentages between the groups. Each questionnaire presented ten choice tasks, including one repeated task. Because completion rates were expected to be lower with CSPC, 60% of individuals were randomly assigned the CSPC and 40% the DCE. Respondents were also asked to rate the importance of each attribute in their choices, and the difficulty of understanding and of answering the tasks. Response behaviours in the questionnaires were compared in terms of the consistency of responses in a repeated task, and the correlation between tasks and variance in responses to identify learning (decreasing variance) or fatigue (increasing variance) effects.

Result: A significantly greater proportion of individuals completed the DCE (154/256=60%) compared with the CSPC (150/348=43%), p<0.001. Among individuals completing a questionnaire, there was no significant difference in the proportion that rated the tasks "somewhat difficult" or "extremely difficult" to understand (DCE=12%, CSPC=13%; p=1) or to answer (DCE=65%, CSPC=66%; p=.94). Responses to the repeated DCE task were not significantly different (p=.22), but individual differences in the repeated CSPC budget allocations were significant (mean difference=7.6%; p<0.001). There were no significant correlations between task and variance for either the DCE or CSPC. Fewer than 10% of all CSPC allocations explicitly equalised QALYs, patients or budgets. Eighteen percent of allocations maximised resources to one particular group and 11% of CSPC respondents maximised in >50% of tasks.

Conclusion: Despite similarities in the ability of respondents completing a questionnaire to understand and answer the DCE and CSPC tasks, the significantly lower completion rate suggests that CSPC was less acceptable in some aspect(s). Consistency across tasks was also better with DCE. However, CSPC can reveal distributional preferences that DCE can not. Better response rates and consistency ('respondent efficiency') with DCE must be weighed against potentially richer preference data with CSPC.

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8. ASSESSMENT OF PARENTAL HEALTH STATE PREFERENCES FOR DIAGNOSTIC EVALUATION AND CLINICAL OUTCOMES IN URINARY TRACT INFECTION IN YOUNG CHILDREN (DEC)

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Purpose: Patients' preferences are essential to decision models, cost-effectiveness analyses, and development of clinical practice guidelines. Most pediatric clinical practice guidelines do not account for patient or parental preferences. Parental values pertaining to diagnostic testing for urinary tract infection (UTI) have not been previously assessed.

The objective of this study was to assess parental values for diagnostic testing for potential UTI in children 2-24 months of age, with fever without source.

Method: We performed a cross-sectional study of parents of children 2-24 months of age who presented to the emergency department of a tertiary care center. Individual interviews were conducted using utility elicitation. Participants were presented with 5 hypothetical scenarios outlining potential experiences during a child's visit to the Emergency Department. All scenarios described a child who may undergo a urine catheterization to make the diagnosis of UTI. All 5 scenarios described temporary health states as outcomes. Subjects were asked to complete 3 tasks: rank scenarios from "Best" to "Worst", rate these scenarios on a

Visual Analog Scale (VAS), and to complete the Chained Standard Gamble (CSG) Exercise. Utilities for each scenario were determined using results from Chained Standard Gamble Technique. Utility means and medians for each of the 5 outcomes were calculated. Nonparametric tests were used to compare utilities between groups of parents.

Result: 117 parents were approached, 81 consented to participate. 68 subjects were included in the final analysis. When ranking the five scenarios, subjects ranked them as was expected by investigators. Results obtained during VAS portion of interview were similar to those obtained during CSG. We found high mean and median utilities for the 5 scenarios. We found no difference in utility values parents of children presenting with fever compared to those of afebrile children or of those parents who had prior experience with urine catheterization compared to those without such experience.

Conclusion: Parents ranking of scenarios suggests that preferences of parents and health care providers are aligned. Parents place high utility values on diagnostic testing for UTI. Presence of fever in the child or parental prior experience with urine catheterization in a child had no significant effect on parents' preferences. When presented with hypothetical scenarios describing fever in a child, parents demonstrated that they prefer to have their child undergo an invasive, uncomfortable procedure over the risk of potential occult UTI.

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9. NAMING THE DOWNSIDES OF SURGERY: RACIAL AND GENDER VARIATIONS IN PERCEIVED HAZARDS OF SURGICAL CARE (DEC)

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Purpose: While past epidemiologic research has identified hazards of individual surgical procedures, little is known as to what cultural notions individuals share regarding potential downsides of surgery. We aimed to characterize themes common to older adults' perceptions of surgery's hazards and assess racial and gender variations in these themes.

Methods: We interviewed English-speaking white and black adults aged 70 and older in an urban outpatient geriatric medicine practice. We conducted a freelist exercise, asking participants to list as many "downsides of surgery" as possible, and collected data on demographics and medical history. We ranked items by Smith's S, a measure of saliency incorporating information on item frequency and rank. We used scree plots to identify highly salient items, and conducted content analysis of salient items by race and gender. We tested for a single, "culturally correct" understanding of the downsides of surgery via cultural consensus analysis among the full sample and by race and gender.

Results: Out of 60 participants, 53% were black, and 47% were white. 30% were male; gender distributions did not differ by race. Our median patient was 76 years old (IQR 69, 82), reported 2 prior surgical procedures (IQR 1, 4), and verified 4 of 14 Charlson comorbidities (IQR 3, 5). 12% reported not completing high school, and 25% lived with a spouse or domestic partner. Both black and white participants viewed pain and the time required for recovery as the two most salient downsides of surgery; whereas the need for anesthesia and perceptions of being "too old" for surgery were more salient among blacks, the risk of death was more salient among whites. Both males and females viewed pain as the most salient downside to surgery; however, the inability to care for one's self after surgery was salient only among females. Cultural consensus analysis indicated no single "culturally correct" definition of surgery's downsides in the full sample or by race or gender.

Conclusions: Participants of differing race and gender voiced many of the same concerns regarding surgical care, yet notable subgroup differences in salient terms also occurred. Differing responses between males and females may reflect variations in available social supports. Further research is needed to understand the implications of group differences in perceptions of surgery's hazards for medical decision-making.

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10. "THE HARDEST DECISION I EVER HAD": PARENT DECISION MAKING ABOUT TNF-&ALPHA; INHIBITOR TREATMENT (DEC)

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Purpose: Parents' treatment decisions in pediatric chronic disease are often complicated by trade-offs between disease and treatment risks, as well as the difficulty of proxy decision making. The objective of this study was to describe the information and process parents use to make treatment decisions for their children with chronic conditions; using decisions about TNF-α inhibitor (TNFαi) treatment, which has risks of immunosuppression and malignancy, as a model.

Method: We conducted semi-structured interviews with parents of children with Crohn's Disease (CD) (n=14) or Juvenile Idiopathic Arthritis (JIA) (n=20) who had experience deciding about TNFαi treatment. Participants had made a decision within the prior year, been referred to the study because of difficulty in decision making or were in the process of making the decision. Interview questions, developed based on existing pediatric decision-making literature and the Ottawa Decision Support Framework, were focused on information used to make decisions, factors that influenced decision making and the decision timeline. We used thematic analysis for all coding and analysis. Coding structure was developed through multidisciplinary team review of the initial interviews. Two coders then coded the remaining interviews, compared coding, and resolved disagreements through discussion. Data was analyzed by thematic grouping and compared between CD and JIA.

Result: For nearly all parents, the decision about TNFαi treatment was the most challenging medical decision they had made. However, parents of children with CD experienced more, and on-going, stress and anxiety related to the decision. In both groups, parents sought information from multiple sources including healthcare providers, the internet and social contacts. They looked for information related to treatment effectiveness, side-effects and individuals' experiences with such treatment. In CD, where the decision often occurred over weeks to months, information was most often used to help make the decision. In contrast, in JIA the decision was often made in a single clinic appointment and information was then used to confirm the parent's choice.

Conclusion: Even after a decision has been made, some parents are left with persistent information needs, long-lasting concerns and worry related to TNFαi treatment for their child. Providing parents with structured support, including treatment-specific information, during TNFαi decision making may lead to improved decision quality, decreased psychosocial distress and, ultimately, improved outcomes for their children.

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11. EXACKTE2: EXPLORING DYADIC RELATIONSHIPS WITHIN PATIENT-PHYSICIAN CONSULTATIONS USING THE ACTOR-PARTNER INTERDEPENDENCE MODEL (DEC)

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Purpose: People involved in dyadic relationships can and often do influence each other's thoughts, emotions and behaviors. Our objective was to explore dyadic relationships within the patient-physician consultation based on the integrated model of shared decision making (SDM) proposed by Makoul and Clayman in 2006.

Method: We carried out a cross-sectional study in 17 primary care clinics in London, Ontario, and Quebec City, Quebec, Canada. We enrolled physicians from participating clinics and one of each physician's patients. We asked the physicians and patients to complete independently a self-administered questionnaire following the consultation. In both physicians and patients, we measured four components of the integrated model of SDM (the independent variables): i) defining/explaining the problem, presenting options and discussing pros/cons; ii) clarifying patients' values/preferences; iii) discussing patients' ability/self-efficacy; iv) checking/clarifying patients' understanding. We used systematic reviews to map existing dyadic measures onto each SDM component. We also measured physician' and patients' personal uncertainty (the dependent variable). All scales had been validated and their dyadic potential confirmed. We then used the Actor-Partner Interdependence Model (APIM) to assess actor and partner effects within the patient-physician consultation. The actor effect occurs when a person's score on SDM components affects that person's score on uncertainty; the partner effect occurs when a person's score affects his/her partner's score on uncertainty. We applied multilevel analyses for the APIM.

Result: Of 382 eligible physicians, 274 physicians (72%) agreed to participate. Physicians' mean age was 36.6 ± 10.7; 64% were female. Of 430 eligible patients, 276 (64%) agreed to participate. Patients' mean age was 49.4 ± 17.7 and 69% were female. A total of 122 complete unique dyads were available for APIM analysis. We found one actor effect explaining physicians' uncertainty (clarifying patients' values/preferences) and three actor effects explaining patients' uncertainty (clarifying patients' values/preferences; discussing patients' ability/self-efficacy; checking/clarifying patients' understanding). We found no partner effects.

Conclusion: The APIM reveals no partner effects for components of the integrated model of SDM practiced during the patient-physician consultation. Therefore, independently intervening on each member of the dyad to reduce his/her personal uncertainty as observed through the actor effects does not risk increasing the other member's uncertainty.

12. HEALTH CARE MANAGERS' PERSPECTIVE ON SHARED DECISION MAKING IN SPAIN (DEC)

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Purpose: To know the acceptability and appropriateness to the Spanish Health System of three American patient decision aids (PtDAs) on type 2 diabetes, breast cancer and herniated disc from the perspective of a group of health care managers, with the aim to promote the shared decision making in Spain.

Method: The three PtDAs were developed by the Foundation for Informed Medical Decision Making (FIMDM) and translated into Spanish. The material was delivered in a booklet and DVD format. Thirteen health care managers analyzed the responses of 85 patients and 77 health care professionals in relation to the three PtDAs evaluated. The information was obtained in facilities of Governmental Health Departments in Madrid, Barcelona and Tenerife using qualitative methods: focus groups and semi-structured interviews. All sessions were audio taped, transcribed and codified with the Atlas Ti v.5.2. by means of an inductive process. The analysis categories were positive issues, aspects to adapt for its implementation, and context of application in Spain.

Result: The overall assessment of the PtDAs was quite positive, being widely accepted by all participants as a way to improve health care by involving patients in informed medical decisions. More specific comments on the PtDAs focused on the clarity and reliability of the information collected. The inclusion of actual patients sharing their experiences was greatly appreciated by all participants. However, the need for cultural adaptation of the materials was a theme that emerged in all groups, but there was no consensus on the issue. Beyond the specific characteristics that should be revised to implement these PtDAs in Spain, health care professionals stressed the need to assess the socio-demographic characteristics, attitudes, and informational needs of potential users. Finally, the health care managers identified several barriers to the implementation of the PtDAs in Spain: paternalistic view of the doctor-patient relationship, lack of financial resources and some organizational and operational aspects of the Spanish Health System.

Conclusion: The analysis of the information provided by health care managers showed that, after a phase of cultural adaptation, the application of these PtDAs on type 2 diabetes, breast cancer and herniated disc in Spain would mean a change in the patient and caregiver relationship, stimulating the improvement of the sanitary infrastructure in Spain.

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13. DONATING YOUR BLOOD? ON THE ROLE OF ASSOCIATIONS, BELIEFS AND MOOD STATES IN DONOR DECISIONS (DEC)

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Decisions about whether or not to donate blood can be based on explicit beliefs ("blood donation is good because it saves lives"), but also on automatic associations ("unpleasant"). When do people behave based on their explicit beliefs and when do they behave based on their automatic associations?

Purpose: To determine if positive versus negative mood states moderate whether automatically activated associations (implicit attitudes) versus explicit beliefs (belief-based attitudes) towards donating blood predicted blood donation behavior.

Methods: Two randomized controlled experiments compared the predictive value of implicit and belief-based attitudes in positive versus negative mood states. Automatically activated and belief-based attitudes were measured with an Implicit Association Test (IAT) and a belief-based measure in accordance with expectancy-value models of attitudes respectively. In a second session, participants were randomized to either a positive or a negative mood induction procedure (watching a short video clip) and behavior was observed: participants could provide personal contact details on a blood donation interest form. The amount of contact information provided was our dependent measure.

Results: In both studies, participants (104) expressed a more positive mood state in the happy versus sad mood condition. The attitude-behavior link was qualified by mood. In a positive mood, automatically activated attitudes were better predictors of behavior than belief-based attitudes, whereas in a negative mood the reverse was true.   The amount of contact information provided was regressed on the attitude (Study 1: IAT-score; Study 2: belief-based attitude), mood condition, and interaction term. This revealed the predicted Attitude*Mood interaction in both studies. Simple slope analyses showed that in the happy condition, participants with negative implicit attitudes (IAT-scores) gave less contact information than those with positive implicit attitudes, whereas IAT-scores were unrelated to behavior in the sad condition. Moreover, in the sad mood condition individuals with negative belief-based attitudes gave less contact information than those with positive belief-based attitudes, whereas belief-based attitudes were unrelated to behavior in the happy condition.

Conclusion: Mood moderates whether automatic associations versus explicit beliefs predict health behavior.
    Keywords: Blood Donation, Behavior Regulation, Mood, Attitude-Behavior Consistency, Associative vs. Propositional Processes

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14. ASSESSING THE ONLINE INFORMATION SEEKING PATTERNS OF PHYSICIANS (DEC)

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Purpose: To identify the perceptions, attitudes, and usage patterns of US physicians regarding online professional medical education.

Method: A multimethod approach was used to assess perceptions, attitudes, barriers to and usage patterns of US physicians regarding online professional medical education. This approach included a literature review, four structured focus group sessions, and survey tool. Responses to the survey were obtained from 500 US practicing physicians across 10 specialties between February 9, 2009 and February 13, 2009. Respondents received a small honorarium for their input.

Result: Of the 500 respondents 67% of physicians go online for clinical information at least once a day, and 27% of the CME credits earned in 2008 were obtained online. Due to usefulness, physicians were most likely to visit Medscape or UpToDate . The most important factors for physicians when deciding on an online educational activity were convenience and credibility of the content, and physicians felt that referencing CME content to clinical evidence was the most important feature in establishing the credibility of an online CME activity. Physicians rated applying content to practice and content that focuses on the types of patients that they see most frequently as the most important characteristics of online CME. Physicians cited payment for access to content, the inability to find specific answers to their questions, and registration for site access as a very significant barrier to accessing online medical information. Physicians reported that online access

has changed the way they keep up-to-date by increasing the convenience of information and providing quicker access to up-to-date information.

Conclusion: Physicians seek information online on a regular basis because they want quick, convenient access to relevant evidence-based information. They are most likely to visit a website for clinical information if the site does not require registration and payment for access. Educational programs that allow in-demand access, reference content to clinical evidence, and present content that is directly translatable to practice are very likely to be used by physicians. This study was supported by Genentech.

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15. DOES IMPROVED NUMERACY MAKE THE GLASS HALF FULL? CANCER PATIENTS' OPTIMISM, NUMERACY, AND PERCEPTIONS OF THE COSTS OF TREATMENT (DEC)

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Purpose: Decision making for cancer patients can be difficult, as they face costly treatment with uncertain outcomes. Patients' optimism, numeracy and perception of whether their family has already made sacrifices to pay for care may affect their choices. However, the relationships between these factors have not been well defined.

Methods: We are conducting a cross sectional study to understand how cancer patients make tradeoffs among treatments of varying cost, efficacy and toxicity. Patients >6 months from diagnosis are being recruited from academic and community hospitals. Patients were asked if their families had made sacrifices to pay for their care. Numeracy was assessed by the Subjective Numeracy Scale (divided into tertiles) and sense of optimism by the Revised Life Orientation Test (scores >17 were considered optimistic). To identify characteristics associated with patients perceiving their care to be a sacrifice, we used logistic regression models with sacrifices as the outcome of interest. Sociodemographics, numeracy and optimism were independent variables (Model 1). We built similar models with optimism as the outcome of interest. Sociodemographics and numeracy were independent variables (Model 2).

Results: 316 patients were enrolled. Median age was 60 years (range 27-90), female gender 61%, and white race 86%. 43% were college-educated with 38% reporting an annual income of >$72,000. 16% were receiving care at a community hospital. 55% were optimists. 21% report that their family made prior sacrifices. In Model 1, patients >65 (OR 0.32 p<0.01) and optimists (OR 0.55 p=0.039) are less likely to report sacrifices. In Model 2, patients with higher numeracy (OR 1.56 <0.01) and age > 65 (OR 1.62 p=0.043) weree likely to be optimists. In this exploratory analysis, there were no significant associations between income, education, gender, marital status, employment, hospital or presence of metastases and whether patients were optimistic or consider their care a sacrifice.

Conclusions: Patients' perceptions of whether care represents a financial sacrifice to their family may be related more to optimism than sociodemographic characteristics such as income or education. Further research is needed to understand the relationship between numeracy and optimism as well as the temporal relationship between optimism and perception of sacrifices. These factors may be important for oncologists as they counsel patients and attempt to understand their motivations for accepting or declining treatments.

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16. SENSITIVITY OF THE EQ-5D FOR MEASURING MENTAL HEALTH IN AFRICAN-AMERICAN TEENAGERS (DEC)

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Purpose: A number of studies have shown the EQ-5D to be insensitive to mental health (MH) domains. It is unclear whether this insensitivity jeopardizes the derivation of utilities from non-preference based measures. In this study, we test for the sensitivity of the EQ-5D for measuring MH in African-American teenagers.

Method: The SF-36, EQ-5D, and Center for Epidemiologic Studies Depression Scale (CES-D) instruments were completed by 472 teenagers (age: mean=17.5, range=16.2-19.9) engaged in the Rural African American Families Health Program, an intervention focused primarily on substance abuse prevention. Five mapping studies were identified that provide algorithms for determining a utility value from SF-36 responses through the EQ-5D. Utilities based on EQ-5D responses were established using the US valuation. For the CES-D, high depressive symptoms were indicated by a score of 16 or higher. Comparisons were made between MH domains using the Spearman rho and within survey responses between genders using the Wilcoxon rank-sum test.

Result: The correlation between the MH domains of the SF-36 and EQ-5D was weak (rho=0.281). This is due in part to the 25% of respondents that reported high depressive symptoms on the CES-D and low SF-36 MH scores yet had no self-reported depression or anxiety on the EQ-5D. Women with high depressive symptoms on the CES-D were significantly more likely to report elevated levels of anxiety or depression (EQ-5D = 1 or 2) than their male counterparts (p=0.038). When these data were used to derive utilities, the mean absolute error (MAE) from mapping the SF-36 onto the EQ-5D ranged from 0.113 to 0.378. For the model with the lowest MAE, 15% of the participants had errors greater than 0.2, with individual errors as high as 0.66.

Conclusion: Our results validate that the correlation between the MH component of the EQ-5D and the SF-36 is weak. This may be due in part to the insensitivity of the EQ-5D to identify depressive symptoms, which may cause the derivation of utilities from mapping to be problematic in situations where MH is an important outcome. Our results indicate that African-American males are less likely than their female counterparts to indicate depression on the EQ-5D when high depressive symptoms were reported on the CES-D, and therefore deriving utilities using a mapping algorithm may be even more compromised in this population.

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17. THE INFLUENCE OF POPULAR MEDIA ON PERCEPTIONS OF PERSONAL AND POPULATION RISK IN POSSIBLE DISEASE OUTBREAKS (DEC)

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Purpose: Infectious disease outbreaks are uncertain and risky events that often attract considerable media attention. Regardless of objective severity, diseases with high media frequency (HMF) are considered to be more serious, and more representative of a disease, than those with low media frequency (LMF)[1]. We assessed the role of the media in perceptions of population risk (perceived population prevalence), and perceptions of personal risk (perceived personal likelihood of infection) for infectious diseases that are either frequently or infrequently mentioned in the public media.

Method: Undergraduate students (n=23) were asked to evaluate 34 medical conditions in a paper-based task, 10 of which were the focus of this study. Five disease 'pairs' were created matching for similar vectors of

transmission, symptoms, prevalence, but differing on media frequency (e.g. high, such as anthrax, vs. low, such as tularemia). Participants rated each disorder in terms of seriousness (10-point scale), representativeness (4-point scale), population prevalence (of 1,000 of their peers), and personal risk (10-point scale).

Result: Participants rated the HMF diseases as more serious (mean = 7.15 compared to 6.0; $F(1,21) = 23.06$, $p < .001$), more representative (3.12 compared to 2.74; $F(1,21) = 26.41$, $p < .001$) , and rarer (28.9 compared to 105.4; $F(1,21) = 70.29$, $p < .001$), than paired LMF diseases. Participants did not rate HMF and LMF conditions differently in terms of personal risk. Coordination between perceptions of personal and public risk was higher for LMF conditions ($r = .63$), than HMF diseases ($r = .42$), indicating a disconnect between personal and public risk perception for HMF diseases. On closer examination of the relation between public and personal risk perception for HMF diseases, a logarithmic function explained more variance ($r = .59$, $p < 0.001$), and performed better than the linear regression ($r = .33$, $p < 0.001$), indicating an overestimation of personal risk compared to population risk.

Conclusion: We found that illnesses with a high media presence are perceived to be more serious and more representative of disease. We also observed dissociation between ratings of personal and public risk. It appears that this dissociation is not being driven by unrealistic optimism, but rather an exaggeration of personal risk compared to overall population estimates (unrealistic pessimism), presumably driven by increased media frequency. [1] Young et al.(2008). PLoS–ONE,3(10),e3552.

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18. EVALUATION OF A DECISION AID FOR ANTIPSYCHOTIC MEDICATION (DEC)

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Purpose: To field test an interactive, computer-based **Decision Aid (DA) about Antipsychotic Medications** that offers objective information about medications, side effects, and a variety of treatment and service options, including complementary and alternative approaches and recovery activities.

Method: SAMHSA contracted with Advocates for Human Potential, Inc. to evaluate user satisfaction. The objectives of the evaluation were to determine: (1) usefulness of the DA, (2) appropriate contexts for the DA, (3) whether the DA supported shared decision-making, and (4) opportunities and barriers related to implementation of shared decision-making in mental health agencies. Quantitative and qualitative data were collected from service users and providers at 3 mental health agencies. Quantitative data were collected through standardized surveys. Qualitative data were collected through focus groups, key informant interviews, and process evaluation.

Result: Across the 3 pilot sites, 84 service users and 15 agency staff participated in evaluating the DA, with staff assisting 114 service users in using it. 92% of participants found the DA easy to use. 95% reported that it was helpful, 96% would recommend it to others, and 88% would use it again. 81% reported that specific DA features were helpful and 62% found links to other information helpful. Some participants were not able to access these links due to navigation problems or time constraints. 62% reported that they wanted the decision to be shared and 54% stated that the decision had actually been shared. 72% reported that as a result of using the DA they told the provider what was important to them, 69% were more confident about asking questions about antipsychotic medications, and 58% were more confident about discussing difficult topics with their provider. All staff who reviewed the DA reported that they would recommend the product to service users and felt that the product supported shared decision-making in mental health. 86% felt that the DA provided sufficient information. A majority, ranging from 67% to 93%, reported that many of the service

users they had worked with benefitted in other ways such as increased confidence about making a mental health decision or talking to a provider.

Conclusion: Our findings strongly support the objectives of the DA: to impart information, promote communication, and provide useful tools for informed decision making around antipsychotic medications.

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19. REVISITING THE ONTOLOGY OF SHARED DECISION-MAKING IN PALLIATIVE CARE USING CRITICAL DISCURSIVE PSYCHOLOGY (DEC)

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Purpose: In the field of palliative care, there is a scarcity of studies exploring how clinical conversations and interactions frame the decision-making process. The aim of this paper is to propose an ontology of shared decision-making (SDM) that differs from mainstream empirical measurements, and a methodological approach that would explicitly address the role of language use in constructing participation in decision-making about palliative care options.

Method: A narrative synthesis of different theoretical and methodological traditions of discourse analysis was produced with a critical assessment of their pertinence to the study of SDM in palliative care. A brief outline of social theory is presented to explore the critical and linguistic turns that enabled the development of discourse analysis and their impact on the ontology and epistemology of SDM. The approaches to discourse analysis reviewed include conversation analysis, critical discourse analysis, and discursive psychology.

Result: Conversation analysis focuses on talk-in-interaction and the architecture of naturally-occurring conversations, and could empirically demonstrate how the sequential order of the interaction shapes patient participation. Critical discourse analysis addresses on the way power relations are sustained through discourse and would explicitly promote social change by exposing the linguistic features of talk that hinder patient involvement and control. The aim of discursive psychology is to problematise the taken-for-granted internal dispositions of psychology and to explore the consequences of talk in justifying social practices. Discursive psychology (Wetherell, 1998) offers a synthetic approach with both technical aspects of conversation analysis and the study of larger social discourses. Adopting a critical and constructivist ontology, discursive psychology could answer broader questions than conversation analysis about the presence and absence of discourses, and address the social and political consequences of the discursive activities constructing patient participation without imposing an explicit political agenda like critical discourse analysis.

Conclusion: Rather than viewing patient preferences for participation as stable internal dispositions, a critical discursive psychology of SDM in palliative care would conceive of patient participation as a process constructed through talk in social interactions. It can contribute to address broader issues such as the respective involvement of patients and health care providers when talking about options that shape the end of life.

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20. SHARED DECISION MAKING IN THE CARE OF PATIENTS WITH CHRONIC VISION IMPAIRMENT (DEC)

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Purpose: Very little is known about the decision making process of clinicians who treat patients with chronic vision impairment (VI) and patient-clinician communications. The purpose of this study is to investigate fundamental models of clinician decision making and patient-clinician interaction in the care of patients with chronic VI.

Methods: A pilot study was conducted using a convenience sample of 32 VI patients from the state of Kansas. Five hypothesized models of clinical decision making were considered as possible outcomes using four hypothesized model factors to represent each decision making model. Data from patient records were extracted to explore the type of decision making model(s) employed during the initial examination encounter based on two model factors: structure and framing of the decision, and decision process. Analysis was guided by a novel conceptual model theorized to elucidate structural, process and outcome components of the vision rehabilitation care process.

Results: Of the five decision making models hypothesized to be employed in the treatment of patients with VI, findings indicate based on two identifiable model factors, the predominant model of decision making occurred in the clinical encounters was shared decision making (75% and 66% respectively). Model factors supported the presence of an informed decision model but at a lower rate (13% and 19% respectively). A normative shared decision making model was not well represented, in part due to a lack of decision support aids in the clinical setting and lack of documentation of patient decision aid availability outside of the clinical setting.

Conclusions: Findings indicate that shared decision making occurs in clinical vision rehabilitation practice. Although several limitations exist, this study provides the first insights into our understanding of the clinical decision making process employed by the vision rehabilitation clinician, and early quantification of clinician-patient interaction. Initial evidence supports the finding of several hypothesized clinical decision making models in use in the treatment of patients with chronic VI, allowing for further study of additional clinical providers and patient populations to refine our understanding of the hypothesized vision rehabilitation decision making process and related fundamental clinical decision making questions including how patient participation is defined in the VR care process.

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21. HOW DO BREAST IMAGING CENTERS COMMUNICATE RESULTS TO PATIENTS? RESULTS OF A NATIONAL SURVEY (DEC)

Erin N. Marcus, M.D., M.P.H., *Tulay Koru-Sengul, MHS, PhD, Feng Miao, M.S. and Lee Sanders, M.D., M.P.H., University of Miami Miller School of Medicine, Miami, FL*

Purpose: To describe current communication practices among a nationally representative sample of mammography centers.

Methods: All members of the National Consortium of Breast Centers Inc., an association of more than 2,000 physicians, nurses, administrators, radiology technicians and others involved in breast care, were sent a 35-question online survey asking about their verbal, written, and telephone communication with patients, whether they employ patient navigators and staff with fluency in languages other than English, and whether

and how they contact patients who do not follow-up. Descriptive analysis of the sample and chi square testing was performed to distinguish differences between subgroups.

Results: Respondents from 243 centers completed the questionnaire (a 31 % response rate). Because of missing data, 221 centers (90.9%) were included in the analysis. Most centers (85.1%) reported no academic affiliation, and almost half (44.3%) reported performing 1,000 or more mammograms monthly. While most centers (81%) participated in programs designed to increase screening among low-income women, a minority (19%) reported that more than a quarter of their patients were publicly insured or uninsured. At least 1 in 8 centers reported practices that may contribute significantly to communication barriers: 17.6% do not routinely telephone patients with results, 13.1% do not have multilingual staff or translators available to answer questions, and 68.8% send result letters in English-language only. Of note, 69.7% use patient navigators. Centers targeting low-income women were more likely to provide a telephone number for patients to call with questions (p=0.0035), but less likely to have multilingual staff (p=0.0122). There were no significant differences between academic and non-academically-affiliated centers.

Conclusions: Effective communication of mammogram results is important to enhance shared decision making and to reduce patient anxiety and diagnostic delay. We found that centers report systemic strengths and barriers to clear communication of mammography results. Many centers employ patient navigators, which may facilitate timely follow-up among patients who face barriers to access and understanding, but more than 2 in 3 centers present barriers to patients with Limited English Proficiency by only providing results in English. Future research should identify the relationship between these communication policies and women's understanding of their results and adherence to follow-up.

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22. DECIDEO : INFORMED DECISION AND PARTICIPATION OF WOMEN TO THE NATIONAL SCREENING FOR BREAST CANCER : A QUALITATIVE OVERVIEW (DEC)

*Aurélie Bourmaud, MD[1], **Mathieu Oriol, MD[2]**, Véronique Regnier, PhD.[1], Nora Moumjid, PhD[3], Patricia Soler, MD[4] and Franck Chauvin, MD, PhD[1], (1)Cancerology Institute of Loire and Jean Monnet University, Saint Etienne, France, (2)Institut de Cancérologie de la Loire, Saint Priest en Jarez, France, (3)Gresac - Umr 5823 Cnrs, Lyon, France, (4)ADEMAS 69, Lyon, France*

Purpose: The aim of this study was to assess the impact of a new informed decision tool on the decision making process of women invited to the national screening for breast cancer. This new tool is a document giving a complete, accessible to all, and scientifically based information on both advantages and disadvantages of the national breast cancer screening.

Methods: The informed decision tool (called DECIDEO booklet) was sent to 4000 women with the usual invitation to participate to the national breast screening. One month later, a panel of 400 women randomised among those 4000 was interviewed by phone with a questionnaire dealing with: - the satisfaction concerning the help to get a decision the DECIDEO booklet brings to them - the level of knowledge about breast cancer and screening the DECIDEO booklet brings to them - the help through the decisional conflict the DECIDEO booklet brings to them - characteristics of the respondents' women including specific focus on socio-economic characteristics

Results: 403 women aged between 50 and 74 answered the questionnaire. Among this sample, 30 % (121) of them actually read the DECIDEO booklet and 20% kept it. Among the women who read the DECIDEO booklet, 98% of them find the information given satisfactory, of good quality and sufficient to take a decision concerning the participation to national breast cancer screening. Having read the document increases the intention to participate to the national breast cancer screening by 12% (56% versus 44%, p<0,05) and increases the average knowledge about breast cancer and interest of the screening of 6 % (82,5 % versus

76,5%). Interestingly, the socio-economic level strongly affects the level of knowledge about breast cancer and screening of the overall sample (71,5% for the women of a lower socio-economic level versus 80 % for the women of a higher socio-economic level, p<0,05).

Conclusions: The DECIDEO booklet was assessed as a satisfactory help for the decision making process by 98% of the users. It increases the knowledge level about breast cancer and screening, but mainly among the women with a high socio-economic level. The question raised is: is it the informed decision approach that is not adapted for the women of a lower socio-economic level or is it the booklet form of the tool ?

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23. PREDICTION MODEL FOR CAESAREAN SECTION RISK IN WOMEN WITH GESTATIONAL HYPERTENSION OR PREECLAMPSIA AT TERM (ESP)

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Purpose: In a recently completed study in women with gestational hypertension (GH) or mild preeclampsia (PE) at term we found that induction of labor prevented complications but did not increase the caesarean section rate (Koopmans et al., Lancet 2009). However, despite this finding certain women may still be at increased risk of a caesarean section (CS) when labor has to be induced. We tried to identify patients at high risk of caesarean section using a prediction model.

Method: We used data from our RCT in patients with a singleton pregnancy with a fetus in cephalic position between 36 and 41 weeks of gestation, complicated by GH or mild PE, comparing caesarean section with other modes of delivery. We considered predictive factors from medical history, clinical characteristics (including parameters of cervical ripening obtained by vaginal examination) and laboratory findings. Missing data were completed by multiple imputation. Using multivariable logistic regression analysis with a p-value < 0.175 for inclusion, we constructed a prediction model for caesarean section risk at two stages: before delivery and during delivery. The predictive capacity of our models was examined with receiver-operating-characteristic (ROC) analysis and calibration plots based on predicted risks averaged across the imputations.

Result: Of the 756 women included, 126 (17%) delivered by caesarean section. The multivariable model for caesarean section risk before delivery had an ROC of 0.833 and included ethnicity, parity, previous abortion, gestational age, type of antibiotic treatment, type of analgesia, and degree of cervical dilatation as predictors. Of the laboratory findings uric acid and the degree of proteinuria were included. The model for CS risk during delivery additionally included a parameter indicating clinical deterioration of GH (based on blood pressure, proteinuria or HELLP syndrome). The ROC increased to 0.844. Hosmer-Lemeshow tests and calibration plots indicated that calibration of both models was acceptable. Overfitting will be estimated by bootstrapping.

Conclusion: In women with GH or mild PE at term, the risk of caesarean section strongly depended on characteristics including ethnicity, parity and deterioration of disease. The identified predictors could help to identify women at high risk of caesarean section and could be used by clinicians in their decision making.

24. ARE INDIVIDUALS SENSITIVE TO HEALTH INEQUALITIES? THE IMPACT OF FRAMING ON JUDGMENTS ABOUT HEALTH INEQUALITIES (ESP)

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Purpose: Health policy makers rely on complex information about the efficiency or efficacy of health interventions when making decisions about resource allocation, must ensure that resources are distributed equitably, and that interventions reduce health inequalities. While we generally assume that information about health inequalities is value-neutral, evidence suggests that informational frame can have an influence on decision making. Here, we investigate the impact of informational frames on interpretations of the success of an intervention in reducing health inequalities.

Method: Undergraduate students (n=27) participated in a computer-based experiment, and were presented with scenarios (n=8 fictional diseases) indicating the impact of a health intervention on two populations (e.g. survival of populations before and after intervention). Scenarios differed according to: presentation of data in terms of survival or mortality; health inequalities that increased or decreased; and size of change in inequalities (large or small). Frame was blocked, all other factors were randomized. Participants rated how successful the intervention was in reducing health inequality (7-point scale), how much of a $100 tax increase should be devoted to the continuation of the intervention, and whether the intervention should continue (7-point scale).

Result: Interventions that led to a decrease in inequality were rated as more successful (4.76 compared to 1.78), more deserving of continuation (4.57 to 3.27), and provided more financial support ($33.82 to $19.88; all Fs>13, all $p<.001$). Participants were more likely to support (4.41 to 3.43), donate to ($34.40 to $19.27), and consider a program successful (3.6 to 2.9; all Fs > 7, all $p<.01$) if it demonstrated a large (rather than small) change in reducing inequalities. Participants responded consistently, regardless of mortality or survival frame for the majority of scenarios. However, when changes in inequality were large, participants donated more money ($29.70 to $39.10) and were more likely to support the continuation of a program (4.67 to 4.15; all Fs > 5.4, all $p<.05$) when the scenario was framed in terms of mortality rather than survival.

Conclusion: Participants were sensitive to increases and decreases in health inequalities, and able to distinguish relative size of such changes. Further, mortality or survival frame seemed to influence decision making in the most extreme of scenarios, where framing the success of the intervention in terms of mortality increased the likelihood of support.

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25. DISEASE BURDEN OF CHRONIC HEPATITIS B AMONG IMMIGRANTS IN CANADA (ESP)

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Purpose: The prevalence of chronic hepatitis B (CHB) infection among immigrants to Canada ranges from 2% to 15%, among whom 40% develop advanced liver disease. The objective of this study was to estimate the disease burden of CHB among immigrants in Canada using Markov cohort models comparing a cohort of immigrants with CHB versus a control cohort of immigrants without CHB.

Method: We developed two Markov cohort models to estimate life years (LY), quality adjusted life years (QALY), and lifetime direct medical costs since 2006: one for a cohort of immigrants with CHB living in Canada and one age-matched control cohort of immigrants without CHB living in Canada. The differences in

LY, QALY, and lifetime direct medical costs between the two cohorts were calculated to evaluate the disease burden of CHB among immigrants living in Canada. In the model for immigrants with CHB, a total of 37 health states that include combination of serologic status (HBsAg and HBeAg), liver inflammation (alanine transaminase(ALT) (normal/elevated)), viral load (high/low) and clinical states (cirrhosis, HCC, liver transplant), were incorporated into the model in order to reflect the natural history of CHB. Parameter values were derived from the published literature.

Result: Our model suggested that the cohort of immigrants with CHB lost average 4.5 LY, increased average $70,177 for lifetime direct medical costs, and had a higher lifetime risk for decompensated cirrhosis (12%), hepatocellular carcinoma (16%), and liver transplant (5%) over the lifetime of the cohort when compared to the control cohort. For a total estimate of 297,572 immigrants with CHB currently living in Canada, it could potentially lose a total of about 1.3 million LY and increase a total of 20 billion on the health care system as a direct result of CHB.

Conclusion: We show that the economic burden of CHB among immigrants living in Canada is heavy. There was a significant loss of life years and quality adjusted life years and an increase in direct medical costs attributed to CHB among immigrants living in Canada. Governments and health systems need to develop policies which promote early recognition of CHB, and raise public awareness regarding hepatitis B in order to extend the lives of infected immigrants.

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26. CANTRANCE: FROM CANCER COMPARATIVE EFFECTIVENESS STUDIES TO DISEASE-SPECIFIC MORTALITY (ESP)

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Purpose: Although disease-specific mortality is a primary endpoint of interest in cancer comparative effectiveness (CE) studies, practical considerations often dictate the study of intermediate endpoints such as disease incidence, detection, severity, treatment, or recurrence. In response, many models that are highly application-specific have been developed to extrapolate to mortality. CANcer TRANslation for Comparative Effectiveness (CANTRANce) is a user-friendly modeling framework that formalizes and streamlines mortality projections for cancer CE studies.

Methods: We constructed a simulation framework with a web interface where users can enter the results of their CE study, choose from several options how to model their intermediate endpoint, and specify key additional information needed to extrapolate from their endpoint to mortality. Disease-specific mortality is then modeled as an exponential process with other-cause death as a competing risk. We applied this framework to two CE studies with different purposes, interventions, and intermediate endpoints: (1) an adjuvant therapy for colon cancer recurrence and (2) a diagnostic test for therapeutic decision-making in breast cancer.

Results: The interface transmits the user's data and modeling specifications to a simulation program that returns estimates of all-cause survival as well as crude and net disease-specific survival over a user-specified time period. All-cause survival is compared across intervention groups to determine the number of years of life saved or lost by the intervention. In the colon cancer example, a treatment that decreased the risk of recurring within 5 years by approximately 20% translated into a gain of about 2.5 years in median all-cause survival and over 100 years of life saved in a population of 2000 over 10 years. In contrast, the change in treatment distribution due to the diagnostic test for targeted therapy in breast cancer corresponded to no significant reduction in mortality, but allowed low-risk women to avoid unnecessary treatment.

Conclusions: CANTRANce is a promising tool for cancer researchers to estimate the impact of interventions on mortality without developing their own complex models. Initial applications suggest that evidence-based modeling assumptions can produce very reasonable results. Future work will expand the suite of examples to additional intermediate endpoints and deploy an open-access user interface.

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27. DOSE-RESPONSE RELATIONSHIP BETWEEN HOSPITAL SURGICAL VOLUME AND PATIENT SAFETY (ESP)

Tina Hernandez-Boussard, PhD, MPH[1], Kathryn M. McDonald, MM[2] and John M. Morton, MD, MPH[2],
*(1)Stanford University, Palo Alto, CA, (2)Stanford University, Stanford, CA*

Dose-Response Relationship Between Hospital Surgical Volume and Patient Safety **ABSTRACT**

Purpose : While the surgical volume-mortality association is well supported for certain high-risk procedures, little is known about the relationship between hospital volume and adverse events. The objective of this study was to examine the relationship between hospital volume and inpatient adverse events.

Methods: Patient Safety Indicator (PSI) were used to identify hospital-acquired adverse events in the Nationwide Inpatient Sample (NIS) database in abdominal aortic aneurysm (AAA), coronary artery bypass graft (CABG) and Roux-en-Y gastric bypass (RYNGB) from 2005 to 2008. In this observational study, volume was defined by year-specific hospital caseload for each procedure. PSI risk-adjusted rates were analyzed by volume for each procedure.

Results : Overall, hospital volume was inversely related to preventable adverse events. Higher volume hospitals had significantly lower risk-adjusted PSI rates compared to lower volume hospitals. The odds of having any adverse event, as identified through PSI software, increased linearly with a decrease in hospital volume: AAA Odds Ratio (OR): 1.016, p <.0001; CABG OR: 1.004, p<.0001; and RNYGB OR: 1.049, p<.0001 (Figure 1).

Conclusion : These data support a dose-response relationship between hospital volume and quality health care delivery in select surgical cases. This study highlights differences between hospital volume and risk-adjusted PSI rates for 3 common surgical procedures and highlights areas of focus for future studies, identifying pathways to reduce hospital-acquired events.

Figure 1. Distribution of Percentage of Cases with a PSI Event for Roux-en-Y Gastric Bypass Procedures by Hospital Volume.
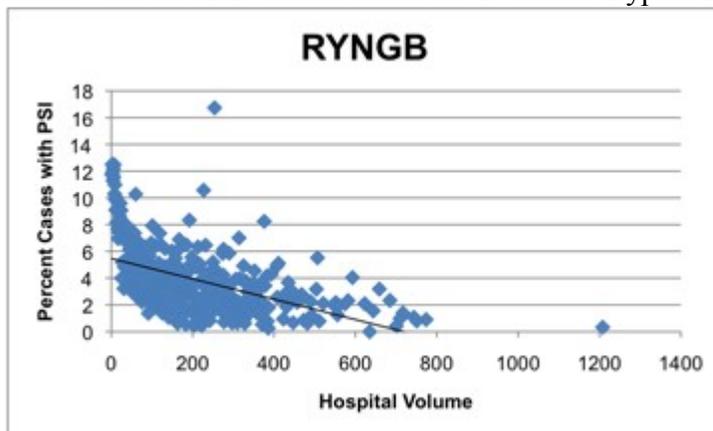
28. DEVELOPMENT OF A COMPUTER-ADAPTIVE INSTRUMENT TO MEASURE DISABILITY IN OLDER ADULTS (ESP)

Christine M. McDonough, PhD, PT[1], Ilona Kopits, MD, MPH[2], Peng Sheng Ni, M.D., M.P.H.[1], Tian Feng, MS[1] and Alan M. Jette, Ph.D., P.T.[1], (1)Boston University School of Public Health, Boston, MA, (2)Boston University Medical Center, Boston, MA

Purpose: The aim of this study was to build a self-report instrument to measure function and disability among older adults for clinical and public health research using Item Response Theory and Computer Adaptive Testing approaches. We structured the instrument to distinguish between limitations in function (the ability to perform discrete physical tasks and activities) and limitations in participation in society (the ability to perform complex activities and social roles). This abstract describes the development of the Disability Scale of the Late-Life Function and Disability Instrument CAT (LLFDI-CAT), which measures limitations in participation (disability) from the perspective of the older adult.

Methods: We conducted an extensive literature review, clinician and subject focus groups, and cognitive testing to guide development of an item bank consisting of 54 items. A convenience sample of 520 community-dwelling older adults answered all 54 items for the calibration study. Confirmatory factor analyses (CFA) were conducted to assess the dimensionality of the scale by comparing the CFA results across different models: (1) one-factor unidimensional; (2) two-factor multidimensional (MIRT); and (3) bi-factor MIRTs. Item Response Theory methods were employed for item calibration and to assess fit. To test accuracy, we used the dataset to simulate 5, 10, and 15 item CATs and compared the correlation, bias and root mean square error (RMSE) between the CATs and the full item bank across Fisher and posterior expected KL (Kullback-Leibler) information select methods. To understand the precision of the score estimation, we examined the standard error of scores for the 3 simulated CATs.

Results: CFA suggested the bi-factor multidimensional IRT (MIRT) provided best fit; therefore the Overall Disability Scale was calibrated with separate "relationship" and "doing things" sub-factors. Fit statistics were acceptable: CFI=0.94; TLI=0.93; and RMSE=0.06. The 15-item CAT demonstrated accuracy compared with the item bank (r>=0.97; and RMSE <0.23) and better precision in the middle of the scale than at the extremes. Specifically, standard errors for Overall Disability scores for the 15-item CAT were less than 0.3 across the -2 to 0 logit score range and less than 0.4 across the -2 to 0 logit score range for the subscale scores.

Conclusions: The LLFDI-CAT Disability scale demonstrated accuracy and precision and has the potential to advance disability assessment in research with older adults.

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29. OBESITY AND MORTALITY IN PERSONS WITH AND WITHOUT OBESITY-RELATED DISEASES: USING DATA FROM NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY III (ESP)

*Su-Hsin Chang, PhD[1], **Lisa M. Pollack, MPT, MA[2]** and Graham A. Colditz, MD, DrPH[1], (1)Division of Public Health Sciences, Washington University School of Medicine, St. Louis, MO, (2)Washington University in St. Louis, St. Louis, MO*

Purpose: This study explores the relationship between obesity and mortality, focusing on obesity-related diseases (ORDs), using a nationally representative sample of the U.S. civilian noninstitutionalized population from the National Health and Nutrition Examination Survey (NHANES) III public-use datasets. ORDs in our study include coronary heart disease, hypertension, type 2 diabetes mellitus, hypercholesterolemia, and stroke.

Method: Obesity has been linked to increased mortality because individuals are at a higher risk of developing obesity-related comorbidities. We used information provided in NHANES III to investigate how the sampled population's individual characteristics, including gender, race, body mass index (BMI), and status of obesity-related diseases influenced their mortality and life expectancy. Deviating from the Cox proportional hazard model adopted in the literature, our study employed the mixed proportional hazards model, which takes into account the unobserved heterogeneity that affects, not only the outcome, but also the observed confounders. Failing to account for it results in biased estimation, and, consequently, misinterpretation of the results.

Result: Our findings showed that people developing ORDs increase their hazard rate by 44%, on average, compared to the people without ORDs of the same gender, race, and BMI level. Being a male, a black, or having a higher BMI level is also associated with higher mortality. Our sensitivity analyses also provided similar results, showing that the findings in the baseline case are robust to different parametric specifications. When broken down to different BMI categories (Figure 1), we found that the hazard ratio of the people with ORDs to those without ORDs is the highest (2.0) among the class II obesity group (35 kg/m^2 ≤ BMI < 40 kg/m^2), indicating that ORDs increase the hazard rate by 100%. The life years lost due to ORDs are on average 4.65 years. Blacks lose nine more life months due to ORDs than whites in the class II obesity group.

Conclusion: This study provided evidence suggesting that ORDs increase mortality by at least 50% for people with BMI greater than 18.5 kg/m^2, especially for those with BMI between 35 and 39.5 kg/m^2, after controlling for individuals' observed and unobserved characteristics. Life years lost due to ORDs range between 2.5 to 7 years.

Figure 1 Life years lost due to ORDs and hazard ratios at all levels of BMI

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30. MATERNAL PREFERENCES FOR CESAREAN: DO WOMEN GET WHAT THEY WANT? (ESP)

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Purpose: Cesarean section rates in industrialized countries have steadily been rising since the 1970s. The aim of this study was to explore the association between delivery preferences during pregnancy and actual delivery mode.

Method: We combined data from the Norwegian Mother and Child Cohort Study and the Medical Birth Registry of Norway (n=66,351). At week 30 of pregnancy women were asked whether they preferred vaginal or cesarean delivery. We used delivery preferences, age, educational attainment, plurality (twin pregnancy) and a range of medical risk factors to explore predictors of the vaginal versus cesarean delivery by means of logistic regression analysis. Subsequently we predicted the probability of cesarean on the basis of the model's parameter values.

Result: Among those with a cesarean preference (5% of the sample), 49% subsequently had a cesarean (13% acute and 36% elective), respectively 12% (9% acute and 3% elective) among those with a vaginal preference. In multivariate regressions, the odds for having an acute cesarean were higher among nulliparous (OR 1.99, 95% CI 1.41-2.81) and multiparous women (OR 2.76, CI 1.36-5.60) with a cesarean preference. For elective cesarean, the respective odds ratios were 12.48 (CI 9.60-16.24) and 9.42 (CI 4.34-20.48). Age, plurality, previous cesarean, breech position and various other medical conditions were also significant predictors. The predicted probability of acute or elective cesarean delivery for women without cesarean preference or medical risk factors for cesarean was 2% for nulliparous and 4% for multiparous. For women with a vaginal preference, but no risk factors the probabilities were 17% and 22%, respectively. When adding various medical risk factors, the probabilities were in the range of 60% to 90%.

Conclusion: Women's preferences have a strong impact on the probability of an acute as well as elective cesarean even when adjusting for a range of medical factors.

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31. FACTORS ASSOCIATED WITH THE CHOICE OF BIOLOGIC DISEASE MODIFYING ANTI-RHEUMATIC DRUGS AMONG RHEUMATOID ARTHRITIS PATIENTS IN CALIFORNIA MEDICAID (ESP)

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Purpose: The objective of this study was to identify sociodemographic and Medicaid plan factors associated with the use of biologic disease-modifying anti-rheumatic drugs (DMARD) over standard DMARDs among patients with rheumatoid arthritis (RA) in California Medicaid (Medi-Cal).

Method: Patient-level data for 7259 DMARD recipients aged between 18 to 100 years old with at least one diagnosis of RA (714.XX) and one DMARD use, was constructed using California Medicaid paid insurance claims and eligibility files, between 01/01/1998 to 12/31/2005. The outcome of interest was the choice between standard DMARDs (methotrexate, lefluonomide, hydroxychloroquine and sulfasalazine) and biologic DMARDs (adalimumab, etanercept, anakinra and infliximab). Biologic DMARDs could have been used in combination with standard DMARDs. Chi-square test and logistic regression model were applied to examine the association between the choice of DMARD and sociodemographic factors (age, gender, race and county residency), RA related medical utilization in the past six months, and Medi-Cal plan factors (exclusive fee-for-service reimbursement in beneficiary's county, and Medicare and Medicaid dual eligibility).

Result: The mean age was 57.8 (±14.8) years with a majority of females (79.8%) and Caucasians (34.8%). Around 14% percent of patients were taking biologic DMARDs. Chi-squared test results showed that age, gender, race, county of residence, dual eligibility, and having recent RA related medical utilization were significantly associated with the choice of biologic DMARD. After adjustment of 13 different comorbidities in the logistic regression model, the results indicated that the youngest age group (18-34 years old) had the highest odds ratio (OR) of using biologic DMARDs (OR=2.46, CI: 1.82 to 3.32), compared with the age group over 65 years of age, and the OR decreased consistently as age increased. As compared to Caucasians,

African American had the lowest OR (0.52, CI: 0.40 to 0.67). The OR of dual eligibility was 1.70 (CI: 1.44 to 2.02). Having RA related medical utilization in the past 6 months had OR=2.89 (CI: 2.49 to 3.45). Patients residing in counties from northern California had OR=0.75 (CI: 0.63 to 0.89) as compared to those in southern California.

Conclusion: In this Medicaid population, we found marked evidence of socio-demographic disparity in DMARD treatment for RA. Our results also highlight the variation in DMARD utilization based on geographic location, and type of insurance coverage.

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32. A DECISION SUPPORT TOOL FOR CATEGORIZING PATIENT ACUITY AT EMERGENCY DEPARTMENT (ESP)

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Purpose: The urgency of care at an Emergency department (ED) in Singapore is prioritized by the nurses' triage that categorizes patients by their acuity level upon their arrival. Ministry of Health (MOH) defines patient acuity category (PAC) 1, 2 and 3 as resuscitation, major emergency, and minor or non-emergency, respectively. The objective of this study is to develop and validate a computerized decision support tool to help nurses make a quick and objective decision on PAC upon arrival.

Method: A retrospective study using routinely collected hospital data to develop a predictive model. All patient visits to the ED from Jan to Sep 2010 were included. Data was extracted from the hospital information system, which included the patients' PAC, demographics, vital signs, presenting symptoms, comorbid conditions, arrival mode and mobility. The outcome categories (PAC 1, 2 and 3) were unevenly distributed and the parallel line test was not satisfied. Therefore two binary logistic regression models with resampling were applied to identify the significant predictors and to estimate the parameters of the models. Model 1 identified PAC 1 and 2 from PAC 3. Model 2 identified PAC 1 from PAC 2. Split validation was applied for Model 1 and bootstrap validation was applied for Model 2. C-statistics of the Receiver Operation Characteristic (ROC) plot was applied to assess the discrimination power of the two models.

Result: There were about 118,000 ED visits from Jan to Sep 2010. Of these, 1.6% were PAC1, 40.5% were PAC2, and 57.6% were PAC3. Model 1 identified patients' presenting symptoms, mobility, age, cause of injury, pulse, comorbid condition of asthma, pain score, body temperature, and blood pressure as the important predictors. Model 2 identified patients' presenting symptoms, comorbid condition of asthma or COPD, pain score, pulse, mobility, body temperature and blood pressure as important predictors. The model demonstrated good performance on the validation dataset with the c-statistics of ROC being 0.945 (95% CI: 0.943-0.947) for Model 1 and 0.906 (95% CI: 0.900-0.913) for Model 2.

Conclusion: We present an internally validated ordinal regression model to assess the patients' need for urgent care at the point of triage. The model may be deployed to support the nurses make decisions on patients' acuity level due to its good validation performance.

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33. EVALUATING A PROPOSED SWOG TRIAL OF BREAST CANCER TUMOR MARKERS: A VALUE OF RESEARCH AND BIOBANK ANALYSIS (ESP)

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Purpose: To assess the expected value (EVPI and EVSI and EVIC) of a proposed clinical trial of patients with early-stage breast cancer with the following aims (1) surveillance using currently available CA15-3/CA 27.29 biomarkers to detect recurrence (2) biobank creation of serial blood specimens that could be used to discover more accurate biomarkers for detecting breast cancer recurrence.

Method: We developed a decision-analytic model comparing the addition tumor biomarker to standard surveillance in patients with early-stage breast cancer. Model parameters and uncertainties, including quality-of-life indicators, were derived from literature values, clinical experts and multidisciplinary stakeholders. Our model also incorporated uncertainties in patient/provider adherence to recommended guidelines. The affected population was estimated from SEER data and discounted over a 10-year time horizon. Expected values were assessed at a $150K/QALY threshold in the base-case. The expected-value-of-individualized care (EVIC) i.e. total potential value of a biobank, was estimated by evaluating the impact of developing an improved diagnostic using biobank samples. Limiting assumptions were then applied to the EVIC to obtain a range of conservative biobank values.

Result: The standard care strategy was found to be cost-effective. However, the acceptability probability was only 55% with individual and population EVPI values of $4,600 and $1.7 billion (10-year time horizon). The EVSI for the trial ranged from $0.25 to $1.3 billion for trial sizes from 100 to 9,000 patients. Key uncertainties dominating EVPI and EVSI magnitudes were impact on survival through earlier detection of breast cancer, and quality-of-life impacts of testing including false positives, burden of increased testing, and deviations of uptake from clinical guidelines. The value of a biobank ranged from $136–700 million under a range of scenarios.

Conclusion: Our findings indicate that additional research assessing the use of breast cancer recurrence biomarkers and consequent earlier treatment could be highly valuable. Given the paucity of prior clinical data evaluating the effectiveness of existing markers, even a relatively small trial could provide substantial societal value. Model analysis suggests that trials focused on reducing uncertainty in survival and quality-of-life impact associated with breast cancer tumor marker testing, represent the most effective investments. Efforts to increase adherence to guidelines in real-world settings can also offer substantial healthcare system dividends. Considerable value may also be derived through trial patient samples stored in a biobank.

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34. SYSTEMS APPROACH TO DISEASE MODELING (ESP)

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Purpose: Current disease models often focus on a narrow class of questions, related to a specific disease stage. Our objective is to develop a systems approach to health economic modeling, capturing all stages of disease evolution. Such an approach will enable (i) evaluation of a wide range of therapeutic options, (ii) optimization of resources allocated to reducing disease burden, and (iii) comprehensive assessment of the downstream effects of clinical decisions.

Methods: We demonstrate the feasibility of the proposed approach by developing a comprehensive representation of colorectal cancer (CRC), which is fully integrated with other diseases captured by the Archimedes Model. The CRC model consists of (i) *a natural history component* that tracks development of pre-cancerous lesions, their transformation into cancerous tumors, growth and spread of tumors, cancer symptoms, recurrence, metastasis, and deaths, in the general population as well as in specific subpopulations, such as those with inflammatory bowel diseases or carriers of mismatch repair (MMR) gene mutations; (ii) *a healthcare process component* that describes the interactions between cancer patients and the healthcare system and the impact of medical interventions, such as behavioral modification, prevention activities, cancer screening, and treatment on CRC outcomes; and (iii) *a family component* that tracks the development of CRC and related diseases in family members.

Results: We used the proposed simulation framework to address a wide variety of questions related to colorectal cancer, including

- What is the cost effectiveness of hybrid screening strategies (combining stool tests, sigmoidoscopy, and colonoscopy) for CRC as compared with single-modality strategies [1]?
- What is the impact of primary genetic screening for MMR mutations in the general population when combining family history-based risk assessment with genetic testing [2]?
- What are the optimal ages to screen for CRC in elderly patients with chronic illnesses (e.g. those diagnosed with hypertension and/or diabetes) [3]?
- What is the cost effectiveness of adjuvant therapy for stage II colon cancer in patients with pre-existing diabetes [4]?

These modeling studies highlight the fact that interesting and unexpected behaviors can emerge from complex relationships between different stages of the same disease, as well as between different diseases.

Conclusion: A systematic and holistic approach to disease modeling is crucial for accurate health economic assessment of modern medicine.

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35. BUDGETARY IMPACT OF ADDING ROFLUMILAST TO MANAGED CARE FORMULARY IN THE TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (ESP)

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Purpose: The purpose of this study was to develop a budget impact model that assesses the economic impact of adding roflumilast to existing chronic obstructive pulmonary disease (COPD) treatment from the perspective of a managed care organization(MCO). Roflumilast, a once-daily oral selective phosphodiesterase-4 inhibitor, is a new approved treatment to reduce the risk of exacerbations in patients with severe COPD associated with chronic bronchitis and history of exacerbations.

Method: A hypothetical MCO with 1,000,000 members was used in the model. Prevalence of COPD was estimated using age-specific prevalence data from National Institute of Health and US census demographic data. The number of severe/very severe COPD patients with chronic bronchitis was estimated based on relevant prevalence rates from published literature. Exacerbation rate, exacerbation costs and relative risk reduction of exacerbation associated with roflumilast were taken from published literature. Wholesale acquisition cost and daily average consumption were used to calculate daily price. Cost parameters that impact MCO's budget included price, co-payment/co-insurance, manufacturer rebate, product utilization, exacerbation rate, exacerbation costs, and relative risk reduction of exacerbation. Roflumilast was assumed to be add-on to existing treatments. The model estimates the impact on the pharmacy budget and medical cost

offset due to the avoidance of potential COPD exacerbations. The model accommodates a one-year time horizon with no discounting. Sensitivity analyses were performed using the upper and lower limits of the 95% confidence intervals for exacerbation rate, costs of exacerbation and relative risk reduction of exacerbation to estimate the range of potential medical cost offset.

Result: An estimated 9,253 patients had severe/very severe COPD associated with chronic bronchitis. The base-case model, assuming 50% of these patients were treated with roflumilast and 25% co-insurance, resulted in an increase of $0.57 per member per month (PMPM) pharmacy costs and a decrease of $0.75 PMPM medical costs, with a net reduction of $0.18 for PMPM total healthcare costs. Key drivers of medical cost reductions were inpatient hospitalization (-$0.53 PMPM) and outpatient visits (-$0.18 PMPM). Sensitivity analyses showed that the result is most sensitive to the relative risk reduction of exacerbations associated with roflumilast.

Conclusion: Addition of roflumilast to COPD treatment may result in a net savings to a MCO when taking potential medical cost offsets into account.

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36. FROM POLICY TO PRACTICE: PRIMARY CARE PHYSICIAN PERSPECTIVES ON VALUE AND ITS INFLUENCE ON MAKING CLINICAL DECISIONS (ESP)

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Purpose: Improving value (outcomes/cost) in healthcare is central to the US Patient Protection and Affordable Care Act, and primary care physicians (PCPs) are key to its delivery. This study examined PCPs' understanding of value, its influence on their clinical practice, and their perceptions of how the healthcare systems in which they work support value-based decision-making.

Method: Twenty-four semi-structured interviews with PCPs as part of three qualitative parallel case studies. The cases were purposely selected to reflect different forms of US healthcare delivery system: a group model integrated delivery system; an independent practice association; and a public safety-net integrated delivery system.

Results: All PCPs recognized value as a priority for their systems and considered their role to be improving outcomes by implementing best practice and preventive care. Half the physicians consciously took cost into account. The concept of value was understood differently by PCPs working in the private systems where few felt cost-constrained. In the public system, value definitions were less likely to refer to cost, and it was more common to feel cost-constrained. In all three cases, patients' sense of value had a growing and direct impact on clinical decision-making. As a system, the group model was described as "cost-conscious" but providing little direct challenge to PCP practice. For the IPA, focus on value was "subtle" and utilization management hurdles were "frustrating". In the safety-net system, PCPs felt the system drove value by maximizing patient throughput, in both primary care and specialist care, resulting in long waits for the latter. Quality metrics were routine in all systems; no PCPs received information on the financial impact of their decisions although most would welcome it. More clinical resources (group model and safety-net system), greater patient education (group model and safety-net system), better links with specialists (the IPA), and better electronic medical records (IPA and safety-net system) were seen as potential ways to improve value.

Conclusion: PCPs appreciated the concept of value but felt more able to focus on quality than cost in their clinical decision-making, whether in public or private, integrated or independent systems. PCPs' ability to increase value could be improved through greater use of cost information complemented by continued system-wide focus on value. This could improve overall value without decreasing physicians' sense of autonomy.

37. ROBUSTNESS OF COST-EFFECTIVENESS ESTIMATES FOR CINACALCET IN SECONDARY HYPERPARATHYROIDISM BASED ON THE ADVANCE TRIAL (ESP)

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Purpose: To estimate the cost-effectiveness of cinacalcet and vitamin D for treatment of secondary hyperparathyroidism (SHPT) compared to vitamin D alone.

Methods: We developed a patient-level simulation Markov model that closely reproduces relevant data of patients in the ADVANCE trial, including serum levels of parathyroid hormone (PTH), calcium (Ca) and phosphorus (P) as they changed over time. After the trial, each life history is projected by expected probabilities of events, similar to a population-level Markov model. Projections of effects are based on relationships of PTH, Ca, and P with mortality, cardiovascular events, fractures, and parathyroidectomies as reported from different published data sources. Three model variations concern dose-effect relationships based on: Block, a large observational study; Cunningham, a combined analysis of four randomized trials of cinacalcet; and Danese, a study investigating the effect of duration in recommended targets. Two other model variations for mortality, cardiovascular events, fractures, and parathyroidectomies after the end of the trial concern: USRDS, the national registry of end-stage renal disease (event rates derived from all dialysis patients); and LDO, the large dialysis organizations registry (event rates derived from subjects with elevated levels of PTH, Ca, and P). The probabilistic sensitivity analysis (PSA) of the Block/USRDS variant considered trial result uncertainty by bootstrapping the set of patients as well as uncertainties of the model parameters used to project post-trial health effects.

Results: Results of the main model variants

	Cost difference / QALY gained		Difference of cost / year treated	
Event rates	LDO	USRDS	LDO	USRDS
Dose-effect relationship				
Block	$54,560	$68,906	$3,155	$2,910
Cunningham	Dominating	Dominating	-$2,698	-$8,904
Danese	$72,456	$78,250	$2,638	$2,217

The PSA showed a 95% likelihood to be cost-effective at a $100,000/QALY threshold. Approximately 70% of uncertainty in estimated net-benefit is from the limited trial size. The remainder is caused by the model parameters; of these, the (literature-derived) utility of dialysis patients and the cost of cardiovascular events cause the largest uncertainty. We also found that the structural assumptions around post-trial extrapolation of serum levels and therapy doses had limited effect on the cost-effectiveness ratio.

Conclusion: The cinacalcet ADVANCE economic model was robust to variations in key parameters used in the cost-effectiveness analysis, demonstrating that cinacalcet treatment could be considered cost-effective for treatment of SHPT in the United States healthcare setting.

38. USING DATA FROM SYSTEMATIC REVIEWS OR MULTIPLE SOURCES IN DECISION ANALYSES IMPACTS CONCLUSIONS (ESP)

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Purpose: To compare the conclusions of decision analyses (DA) and matching systematic reviews (SR) of randomized controlled trials (RCTs).

Methods: We searched PubMed up to 2008 for DAs comparing at least two interventions followed by SRs that matched the DAs based on patient population, intervention, control, and outcome criteria (PICO). From each DA and SR, we extracted data on PICO, conclusion, and impact of sensitivity analyses on the conclusion. We also collected data on the DA design characteristics such as: whether DA conducted primary data collection, derived data from published literature, used data from meta-analysis, incorporated expert opinion, and used single or multiple data sources. Agreement between DA and SR was based on matching of respective conclusions. We examined association of DA design characteristics with agreement by Pearson Chi-square or the Fisher's exact test.

Results: From 42,704 retrieved DA citations, we found matching SR for 38 comparisons (Figure 1). Infection (11/38) and cancer (10/38) were the most frequently studied diseases. There was a 74% (28/38) agreement between the conclusions of the DAs and the SRs. Twenty-six percent (10/38) of the SR conclusions disagreed with the conclusions of the DA. The sensitivity analyses conducted in either DA or SR did not impact the agreement. Two DA design characteristics were significantly associated with agreement: use of single versus multiple data source (p=0.048) and use of meta-analysis data (p=0.040).

Conclusions: This first study quantifying the correlation between the results of DA and SR of RCTs suggests a high level of agreement. These findings emphasize on the need for incorporation of data from systematic reviews or multiple sources, when possible, to inform the decision analyses. However, the findings are limited by small sample size (N=38). Nevertheless, it appears that use of meta-analysis data and use of multiple sources of data impact the predictive value of DA.

Figure 1

Studies retrieved from PubMed (n=42,704)

Excluded (n=42,617)
Non-DA (n=38,644)
Reviews (n=1,332)
Cost-analysis (n=1,195)
RCTs (n=650)
Comments (n=556)
Editorials (n=240)

Studies comparing two or more interventions using decision analyses (n=87)

Excluded decision analyses (n=49)
Matching individual RCTs not found (n=47)
Non-English (n=2)

Decision Analyses (n=38)
(Comparisons, n= 61)

Comparisons (n=61)

Comparisons with NO matching Systematic Reviews (n = 23)

Found matching Systematic Reviews (n=38)

Agree (n=28)
Cancer (n=8)
Infection (n=7)
CVS (n=5)
Other (n=3)
GI (n=2)
OBGYN (n=2)
Skeletal (n=1)

Disagree (n=10)
Infection (n=4)
Cancer (n=2)
Other (n=2)
CVS (n=1)
GI (n=1)

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39. ASSESSING THE BROADER BENEFITS OF VACCINATION TO INFORM NATIONAL PRIORITY SETTING (ESP)

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Purpose: Vaccination programmes are an expensive public health investment, particularly in low/middle income countries. However, traditional methods for assessing the value of vaccination (such as cost-utility analysis) ignore many of their broader benefits that may be of interest to policy makers in such countries. In

order to assist policy makers, the World Health Organization commissioned a study to investigate the usefulness and feasibility of methods of capturing these broader benefits.

Method: The study consisted of (i) a systematic review of existing micro- and macroeconomic measurement tools to investigate the (beneficial and detrimental) effects of vaccination, (ii) an internet questionnaire and face-to-face interviews of key stakeholders to determine which of the effects were most useful to decision making, and (iii) a workshop with experts on decision analysis and health economics related to vaccination to discuss the feasibility of using these tools in practice.

Result: Benefits of vaccination that have been discussed in studies include improvements to non-health budgets (as a result of increased taxation and reduced spending on welfare), lifetime productivity gains (due to reduced cognitive impairment, preventing physical handicap and improved educational outcomes), improved age-dependency ratio (as a result of reducing child mortality and hence reducing fertility rates) and externalities to the wider community (such as the effect of a child's vaccination on non-vaccinated community members). Many of these benefits are relevant to stakeholders in low/middle income countries and are feasible to implement in decision analytic studies.

Conclusion: Besides traditional cost-utility analyses, other tools that reflect the broader benefits of vaccination can contribute to improved decision making in low/middle income countries.

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40. SYSTEMATIC REVIEW OF THE ECONOMIC AND EPIDEMIOLOGICAL BURDEN OF BLEEDING-RELATED COMPLICATIONS IN INDIA (ESP)

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Purpose: To explore peri-operative bleeding and its relationship with patient morbidity, mortality and increased healthcare costs in India.

Method: The EMBASE and Medline databases were searched to identify relevant epidemiological and economic studies. To ensure pertinence of the data, only studies published between 1995–2010 were considered. Relevant studies were identified using *a priori* defined inclusion criteria relating to the patient population, setting and outcomes of interest.

Result: Forty-seven studies were included in this systematic review. The incidence of significant peri-operative bleeding events in India ranged from 1–6.4%. The median volume of blood loss per procedure was 601 mL (range: 133–7250 mL). The average transfusion volume ranged from 2.5–8.5 units/patient for red blood cells, 0.44–7 units/patient for fresh frozen plasma, and 0.46–6.6 units/patient for platelets. Peri-operative bleeding was associated with increased mortality, infection rates, re-operations, and conversion to open surgery. Studies found that approximately 10% of recipients develop transfusion transmitted infections (TTIs) such as HIV, hepatitis B and C. Patients with peri-operative bleeding had an increased hospital stay of 4–5 days, this equates to additional costs of US$320. Pre-operative over-ordering of blood further adds to the burden to the healthcare system. Studies in India reported cross-match to transfusion (C:T) ratio of 2.1–10, indicating that up to 90% of ordered blood are wasted.

Conclusion: This review has identified several areas in which peri-operative bleeding may be associated with increased patient morbidity, mortality and costs to the Indian healthcare system. This includes the increased need for transfusions, risk of complications and extended hospital stay. TTIs such as HIV have severe implications for the patient and result in substantial lifetime costs to the health care system. The high

rate of TTIs in India has been attributed to the high proportion of donated blood from replacement donors, where the prevalence of infections is higher, compared to non-remunerated voluntary donors. The over-ordering of blood was also found to be common practice in India and represents a costly waste of a scarce resource. Consequently, strategies and interventions that reduce bleeding-related complications and the use of blood products may improve resource utilisation and the efficiency of the healthcare system in India.

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41. PRICE TRANSPARENCY: AN INNOVATIVE MEANS OF CONTROLLING MEDICAL EXPENDITURES? (ESP)

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Purpose: In response to ever-increasing health care costs and the lack of cost-sensitivity by many patients, self-insured employers are shifting to consumer driven high-deductible health plans. There has been a proliferation of tools to help support the medical decision making needs of this population. We evaluated the effects of a price transparency tool on medical expenditures among patients on high-deductible plans.

Methods: We prospectively evaluated the health care utilization of a cohort of patients in northern California (n=3007) with health plan deductibles >$1000 between June 1 2010 and December 31, 2010. All participants had access to an easy to use, cost transparency tool that provides patients with their personalized out-of-pocket costs for healthcare services. The tool was provided at no cost to the participants and no additional incentives were provided to encourage its use. We defined searchers as participants who used the tool to find at least one price for a healthcare service. We further defined active searchers as participants who searched for and then received the corresponding medical service. We compared the healthcare utilization of searchers and non-searchers using t-tests.

Results: 17.8% (n=534) of participants used the tool to search for a medical service. Searchers tended to be more likely than non-searchers (n=2473) to be women (58% vs 43%; p=0.11) and to be older (45% > 60 years vs 40% > 60 years; p=0.22). For selected high-cost procedures, searchers received lower cost alternatives than non-searchers; PET withCT scan ($450 vs $822), CT scan of the chest ($213 vs $362), and MRI of the breast ($450 vs $822), although none of these were statistically significant differences. Similarly, active searchers had higher total annual spend per person ($1308) than non-searchers ($750).

Conclusions: Patients who search for cost information may be more likely to obtain lower-cost services than patients who do not seek this type of information. This suggests that people who bear a heavier burden of their healthcare costs have more incentive to shop to reduce them. Price transparency tools may be an innovative means to control medical expenditures; however, incentives may be necessary to encourage their use.

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42. COST-EFFECTIVENESS OF MEDICARE PART D PLANS IN SCHIZOPHRENIA (ESP)

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Purpose: The Medicare Part D prescription drug benefit has a coverage gap, imposing risks for discontinuing medications, particularly in mental health disorders where drug costs are high. However, some

plans offer partial gap coverage and some beneficiaries get full coverage through subsidies. It is unclear how different benefits affect health outcomes in schizophrenia.

Methods: We constructed a Markov model using all 2007 Medicare beneficiaries with schizophrenia enrolled in stand-alone Part D plans. We estimated the cost-effectiveness of three types of plans: 1) no coverage in coverage gaps, 2) generic drug coverage only, or 3) full drug coverage in low-income beneficiaries, termed low-income subsidy (LIS) plans. To control for differences in each plan's beneficiaries, outcomes (hospitalization, mortality, and costs) were adjusted for age, sex, race, and comorbidity. We obtained quality of life utilities from the literature and took a societal perspective. The model, during its 1-year time horizon, assumed that all beneficiaries were on drug therapy and no plan switching occurred. In the base case, we assumed no differences in outpatient treatment utility (base case: 0.81) between plans, which we examined further in sensitivity analyses.

Results: In aged and disabled patients with schizophrenia, no significant differences in mortality between plans were seen. As shown below, yearly hospitalization rates were lower and average yearly drug costs were higher in LIS after adjustment; total medical costs were similar between plans.

Status	Coverage	Hospitalization Rate	Drug costs	Total costs
	No Coverage	52.9%	$5,344	$31,354
Aged	Generic-only	50.2%	$5,514	$30,038
	LIS	44.7%	$8,308	$31,239
	No Coverage	39.9%	$6,452	$23,653
Disabled	Generic-only	37.3%	$6,622	$22,336
	LIS	32.3%	$9,416	$23,537

In the cost-effectiveness analysis, generic-only coverage cost less and was more effective than no coverage. Compared to generic-only, LIS cost >$850,000/QALY. However, effectiveness differences between plans were small; if utility in the LIS plan improved (from decreased anxiety about coverage and/or better health) due to more generous coverage, LIS cost <$100,000/QALY if its associated utility was >0.01 higher than the utility of other plans.

Conclusion: In our model, generic drug coverage was cost-saving compared to no coverage in schizophrenia while improving health outcomes. Drug costs for LIS plans were substantially more than other plans, but LIS's more generous benefits may be economically reasonable if they result in improved health utility.

43. ADOPTION DECISIONS FOR NEW RADIOTHERAPY TECHNOLOGY FOR BREAST CANCER (ESP)

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Purpose: To better understand physician decision-making concerning adoption of new technology, particularly catheter-based accelerated partial breast irradiation (APBI) for breast cancer prior to Phase III randomized trial (RCT) publication. APBI requires treatment twice daily for 5 days instead of daily for 5-7 weeks.

Method: Qualitative analysis of interviews based in grounded theory with 8 surgeons and 9 radiation oncologists across the United States identified through purposive sampling to obtain varied perspectives of community-based (private/HMO, urban/non-urban) physicians.

Result: Physicians averaged 21 years (range: 1.5-50) in practice, with a mean of 40% (range: 7-98%) breast cancer patients at time of interview. Although most physicians learn about new technologies elsewhere, the decision to adopt a new technology was discussed and agreed upon within their social networks at their home institution and local geographic area, requiring partnership between surgeon and radiation oncologist. No definitive level of evidence was requisite before technology adoption; RCTs were preferred, but because technology evolves quickly, physicians must be ready to act on often-limited information or intuition and by practicing the "art" of medicine. Several barriers, facilitators, and pressures for adoption were raised: physician motivation is required for adoption, but radiation oncologists often were described as too "old" or "conservative" to learn new technologies; radiation oncologists must be present for each APBI treatment, altering workflow; surgeons may threaten to refer patients elsewhere if a radiation oncologist does not adopt APBI; physicians must be cautious because poor outcomes can decimate one's program/practice; patients aware of new technology often exert pressure for adoption; community standards, not necessarily high-quality evidence, pressure physicians to adopt technology to keep up with peers; and device companies facilitate matches between, and training for, surgeons and radiation oncologists interested in adopting APBI. Financial incentives seem to play a role in technology adoption, particularly for surgeons who would not otherwise benefit from radiotherapy, and non-financial adoption incentives would lead to increased income indirectly.

Conclusion: Preference for high-quality evidence often gives way to patient pressure, financial incentives, and community norms. Unique to APBI, surgeons and radiation oncologists cannot adopt independently and must develop partnerships and agree to adoption. Although radiation oncologists may be concerned about declining income-per-patient due to APBI, the trade-off between fractions-per-patient and number of patients seen works in favor of APBI.

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44. OUTPATIENT TREATMENT OF PANIC DISORDER SIGNIFICANTLY IMPROVES ABSENTEEISM AND PRESENTEEISM AT WORK (ESP)

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Purpose: This study aimed to identify the lost productivity time (LPT) for patients with panic disorder in Korea to establish relative costs to employers. It also assessed change in LPT after twelve weeks of treatment with SSRI's while comparing to healthy controls.

Method: Working patients diagnosed with PD without other major medical or psychiatric illness were recruited at outpatient psychiatric clinics in Seoul (N=120). Age and sex-matched healthy controls were recruited through advertisement (N=112). Health and productivity, panic disorder symptoms, and depressive symptoms were assessed using the Korean version of the World Health Organization's Health and Work Performance Questionnaire (HPQ), the Panic Disorder Severity Scale (PDSS), and the Hamilton Rating Scales for Depression (HAM-D) at baseline, week four, and week twelve.

Result: At baseline, the PD group showed significantly higher LPT compared to the control group (103.02 vs. 47.29). The annual per-employee cost of LPT due to PD was estimated to be at $13,290, which amounts to 46.6% of the average annual salary in the PD group. After twelve weeks of treatment, the PD group displayed significant clinical improvement as well as improved productivity with marked reduction in LPT. The treatment was estimated to save total cost of LPT by $15,585 annually in the PD group.

Conclusion: Our data suggests that PD causes a large amount of loss, and that short-term psychiatric treatment can save this loss. Psychiatric health professionals along with employers should make efforts to develop more accessible healthcare environment for working patients with PD.

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45. PATIENT-REPORTED PSORIASIS DISEASE FLARING AND IMPACT OF FLARE FREQUENCY ON HUMANISTIC OUTCOMES (ESP)

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Purpose: Psoriasis (PsO) patients may have increased outpatient healthcare resource utilization during the times when they are experiencing disease flares. Literature reports that health plans may reimburse up to $86.6 million nationally on outpatient physician visits for approximately 1.4 million Americans with PsO.[1] The purpose of this study was to assess PsO flaring and the impact of the frequency of flares on PsO-related quality of life outcomes.

Method: Cross-sectional data were collected via the Psoriasis Patient Study Project conducted March 1-April 30, 2010. Study participants were recruited from an Internet panel, aged ≥18 yrs, and self-identified as having PsO. Current treatment type [biologics (BIO), prescription oral (Rx/Oral), phototherapy (PT), prescription topical (Rx/Topical), over-the-counter (OTC), and untreated (UT)] and self-reported disease severity (mild, moderate, severe) were reported. Frequent flaring was defined as occurring continuously or more than once per week, as reported by the patient. Infrequent flaring was defined as occurring less frequent than once per week. Outcomes were measured by the Dermatology Life Quality Index (DLQI) and Skindex-16 instruments.

Result: A total of 1,017 respondents completed the survey (57% female; mean age = 53 yrs; mean 17 yrs of diagnosed PsO). When asked about disease severity, 60% reported mild disease, 35% moderate, and 5% severe. Overall, 28% of all PsO patients reported their disease as continuously flaring, with a significantly higher proportion of those with severe (60%) and moderate (36%) disease experiencing continuous flares compared with mild (20%; p<0.05). BIO use was significantly greater in patients with severe (33%) and moderate (17%) disease compared to those with mild disease (5%; p<0.05). Fewer moderate/severe BIO-treated patients (n=79) reported continuous flares (25%) compared to moderate/severe Rx/Topical or moderate/severe UT patients (47% for both; p<0.05). Patient-reported frequent flaring was statistically significantly associated with worsened outcomes compared to infrequent flaring.

Conclusion: Greater PsO disease severity may be associated with frequent flaring and worsened outcomes. Once biologic-experienced, 1 in 4 moderate to severe patients reported continuous flares. There is still an

unmet need for treatment options offering better flare control. [1] Javitz HS et al. *J Am Acad Dermatol*. 2002;46(6):850-860.

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46. COST OF THERAPIES TO INDUCE REMISSION IN PATIENTS WITH WEGENER'S GRANULOMATOSIS (ESP)

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Purpose: Wegener's granulomatosis (WG) is a rare blood vessel disease, fatal without therapy (1 year mortality: 80%). Cyclophosphamide and glucocorticoids, the standard of care to induce remission, are associated with severe side-effects (infections, infertility, malignancies…). In France, intravenous cyclophosphamide (IVCYC) is recommended in first intention and oral cyclophosphamide (ORCYC) in second, whereas it is the reference therapy in USA. Rituximab, mainly used for treating B-cell lymphomas, has recently been used as salvage therapy in treating autoimmune diseases. As a chronic disease, WG management is in France entirely reimbursed to patients by healthcare insurance. Recently, a non inferiority clinical trial found rituximab as effective as ORCYC in inducing remission. To estimate from a societal viewpoint the costs of 6 months therapy to induce remission in a 'base case' patient (53 years old patient affected by severe WG) treated with ORCYC, IVCYC or rituximab.

Method: The database of inpatient stays in a French Hospital during 2009 was analyzed to identify stays required for WG management (type, length and cost of stays). To evaluate the cost of patients' treatment during 6 months, therapies, protocols and regimens followed were those recommended by healthcare authorities and experts. Our analysis included costs of drugs, hospital stays in public hospitals and treatment of severe pneumonia (the most frequent side-effect). As IV drugs are administrated to inpatients, their costs are included in those of hospital stays except for rituximab classified in the high cost drug list. Non medical costs (i.e. transports and sick pay received by patients during unemployment) were also evaluated.

Result: The average remission-induction therapy costs 19,134€ with ORCYC, 24,217€ with IVCYC and 28,653€ with rituximab. ORCYC is less costly because of less hospital stays needed. Rituximab is the most expensive mainly due to the price of injections higher than IVCYC injections (1674 euros vs. 10 euros).

Conclusion: We could evaluate the average cost of three strategies to induce remission in a base case patient with WG. Rituximab strategy is the highest. The route of administration and the price of drugs are prominent. Therefore, currently, rituximab could be used when cyclophosphamide is contraindicated and in refractory patients where it seems to be more effective. Long term data on remission duration and relapses are expected to evaluate the cost-effectiveness of rituximab.

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47. TRENDS IN THE USE OF INDIRECT COMPARISONS AND NETWORK META-ANALYSIS – EXPERIENCE FROM DRUG SUBMISSIONS FOR REIMBURSEMENT IN CANADA (ESP)

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Purpose: In the absence of head-to-head trials, indirect comparisons (IDCs) or network meta-analysis (NMA) can be used to inform the comparative clinical effectiveness of health interventions, which can further be used to determine comparative cost effectiveness. The purpose of this review was to assess the use of IDCs and NMAs in pharmacoeconomic (PE) submissions to the Common Drug Review at the Canadian Agency for Drugs and Technologies in Health (CADTH) between 2007 and 2010.

Method: All PE submissions to CADTH between 2007 and 2010 were reviewed; submissions relying on IDCs and NMAs were identified; and, details on the methodology were collected and assessed.

Result: In 2007, six of 28 (21%) PE submissions included an IDC – none were based on an NMA. In 2010, eleven of 21 (52%) PE submissions included either an IDC or NMA – four (36%) used an NMA. There was also a trend towards increased use of Bayesian methods and a greater number of treatments and studies included in evidence networks. Given the increased complexity of evidence networks, assessment of heterogeneity/inconsistency, model fit, and convergence is required; however, information on these parameters was not typically reported.

Conclusion: The use of IDC and NMA in PE evaluations submitted to CADTH increased sharply between 2007 and 2010. To allow for critical assessment of PE submissions, which employ IDC or NMA, clear and transparent methods need to be provided for the purpose of reimbursement recommendations based on comparative clinical effectiveness and cost effectiveness.

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48. EVALUATION OF CANCER INCIDENCE IN AUSTRIA AND TREATMENT PATHWAY IDENTIFICATION IN INTRAMURAL AND EXTRAMURAL HEALTH CARE BASED ON LONGITUDINAL ACCOUNTING DATA (ESP)

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Purpose: Aim of the project was the identification of 2007 cancer incidence for Austria based on a longitudinal billing dataset for the years 2006 and 2007. Grading according to age and sex as well as comparison with the Austrian cancer registry and an analysis of the usage potential are included.

Method: Data extraction and filtering for cancer incidence is realized in several steps based on a relational database including drug prescription, stationary visits and extramural health service for anonymized Austrian inhabitants. First inpatient datasets are filtered by relevant ICD-10 diagnoses for 2007. Then the number of identified persons is reduced by the patients having a similar hospital stay in 2006 (only new diseases should be detected). Next the procedure includes only those patients with a readmission to hospital. Patients with only one hospital stay are excluded because it is very likely that they just had one control visit. Afterwards the drug prescription database is searched for relevant prescriptions in cancer therapy given before the first hospital stay occurs, which leads to the elimination of the identified persons from the list of the new emerging cases.

Result: Using the declared methods for determination of liver and breast cancer disorders in the year 2007 results in 906 respective 4882 new cases. In comparison with data collected by the cancer registry conducted by Statistik Austria which reports 892 respective 4833 new cases high accordance can be seen. The difference is in both cases less than 2% and can be explained by exclusion of private financed hospitals in the billing data sets. Using data sources from intramural as well as extramural health care institutions on the single patient level with fine time resolution facilitates highly reliable results.

Conclusion: Using billing data for identification of new tumor cases in comparison with overall cases reported by data from Statistik Austria leads to the insight that this method is highly reliable. The main benefits are first getting the whole patient way through the health care system after the time point of cancer detection. Second, the analysis of the medical treatment and drug data prior to tumor detection leads to additional insights about high risk factors and high risk groups. This knowledge can subsequently be used for identification of groups for screening.

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49. IMPACT OF NONCOMPLIANCE WITH DIABETES CARE GUIDELINES ON EMERGENCY ROOM VISITS AND HOSPITALIZATIONS IN A CALIFORNIA MEDICAID TYPE 2 DIABETES MELLITUS POPULATION (ESP)

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Purpose: To assess the impact of poor compliance with American Diabetes Association (ADA) guidelines for prevention and management of diabetes complications on emergency room (ER) visits and hospitalizations.

Method: California Medicaid eligibility and administrative data from 2002 through 2003 were used to identify patients. Included patients were ≥40 years of age with two diagnoses of type 2 diabetes mellitus, or one diagnosis of type 2 diabetes and a prescription fill for an oral anti-diabetic medication. They were also continuously eligible for coverage in 2004. Patients who did not have at least two glycosylated hemoglobin (HbA1c) tests, one eye exam, and one low-density lipoprotein-cholesterol (LDL-C) test in 2004 were classified as noncompliant with ADA guidelines. Zero-inflated negative binomial (ZINB) regression models were used to estimate the relationship of noncompliance with ADA guidelines with two outcome variables in 2004, 1) number of ER visits, and 2) number of hospitalizations.

Result: Of 29,319 individuals who were identified as type 2 diabetes, 12,293 (42%) were noncompliant with ADA guidelines. Approximately 12% and 14% of patients had at least one any cause ER visit and hospitalization, respectively. After controlling variables for patients' social demographic characteristics, health insurance status, and number of comorbidities, noncompliance with ADA guidelines was independently associated with increased number of ER visits (0.0517 ± 0.010, $p < 0.0001$) or increased number of hospitalizations (0.0627 ± 0.006, $p < 0.0001$). Increased filling of oral anti-diabetic medication across classes was associated with increased number of ER visits (0.0045 ± 0.0006, $p < 0.0001$) and increased number of hospitalizations (0.0037 ± 0.0005, $p < 0.0001$).

Conclusion: Noncompliance with ADA guidelines was significantly associated with an increase in the number of ER visits and hospitalizations in a California Medicaid population with type 2 diabetes. These results reinforce the importance of following ADA guidelines for prevention and management of diabetes complications to reduce poor health outcomes.

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50. MULTIPLE CRITERIA DECISION ANALYSIS FOR HEALTH TECHNOLOGY ASSESSMENT (ESP)

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Purpose: This paper aims to look at the applicability of multi criteria decision analysis (MCDA) for health technology assessment.

Method: MCDA is aimed at supporting decision makers faced with evaluating alternatives taking into account multiple, and often conflictive, criteria. This manuscript begins with a critical review of state-of-the-art methods for incorporating multiple criteria in health technology assessment (HTA). An overview of MCDA is provided and is compared against the current NICE (National Institute for Health and Clinical Excellence) health technology appraisal process. A generic MCDA modelling approach is described and the most common types of MCDA models are detailed. The different MCDA modelling approaches are applied to a hypothetical case study. Finally, the issues that need to be considered for the application of MCDA in HTA are examined along with recommendations for future research.

Result: Most of the proposed MCDA approaches in literature use the same technique (weighted sum approach) which may lead to the researchers/health professionals assuming that it is the only relevant MCDA method. MCDA does not just stop at simple weighting and scoring; more flexible approaches are available that appear to be more relevant to the NICE appraisal process and value based pricing (VBP).

Conclusion: There is a semblance between main MCDA modelling approaches and other techniques (such as programme budgeting and marginal analysis [PBMA], VBP and NICE recommended table of the summary characteristics). However, there are general practical issues that might arise from using an MCDA approach in the HTA process and it is suggested that appropriate care needs to be taken to address the issues identified in order to ensure the success of MCDA techniques in the appraisal process.

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51. PERCEPTIONS AND REALITIES OF FOOD FORTIFICATION IN PREVENTING ANEMIA (ESP)

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Purpose: In Armenia 37% of children under-five years of age and 25% of women suffer from some degree (mild, moderate, or severe) of anemia. In response to these health challenges in 2009 the Government of Armenia decided to launch national flour fortification initiative. This study was conducted to determine the perception of Armenians toward food fortification for anemia prevention and to assess effectiveness of fortification from the internationally published literature.

Method: Nine qualitative focus group discussions were conducted with the general population, millers and health care providers in Armenia. A systematic review of 32 randomized controlled trials, meta-analyses, and other systematic reviews was performed to assess benefits and shortcomings of iron food fortification. PubMed and Hinari databases were searched for relevant English language articles published between 1975 and 2011. Studies were categorized based on the following study populations: children (17 studies), adults (9 studies), and entire population (6 studies). Differences were evaluated between methods (sprinkling/ fortification) and types of iron supplementation.

Result: The majority of focus group participants expressed distrust toward flour fortification. Concerns included the lack of studies in Armenia showing the need for food fortification, negative aspects of additional iron intake by non-anemics, and insufficient research on the health benefits and adverse affects of fortification. Systematic review of studies with children showed anemia prevalence decrease after iron fortification. Two-thirds of the studies including the whole population found iron fortification ineffective. Comparing type of iron supplementation (electrolytic /sodium iron edetic acid /ferrous fumarate, etc.), electrolytic iron supplementation was found to be the least effective. Comparative studies showed sprinkling

more effective than fortification. Focus group concerns for food fortification leading to accumulation and overdosing of iron in the body, taste changes and obesity were discredited by the systematic review. Focus group participants suggested having both fortified and non-fortified products with identifying labels in the market to provide a choice for consumers.

Conclusion: There are many misconceptions about iron fortification in the population. There is also lack-of-clarity on the effectiveness of supplementation to reduce anemia in the general population. For successful implementation of effective fortification, an educational promotional campaign to correct misconceptions and further research to assure effectiveness are both necessary.

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52. PATIENT PERCEPTIONS AND EXPERIENCES WITH SITES OF CARE (SOCS) AMONG PATIENTS WITH IMMUNOLOGY CONDITIONS CURRENTLY USING INTRAVENOUS (IV) BIOLOGIC THERAPY (ESP)

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Purpose: Intravenous infusion (IV) biologic therapy can be administered in various sites of care (SOCs). Patient preference and satisfaction data informing quality of care perceptions are sparse. The purpose of this study was to evaluate patient perceptions, satisfaction and experiences, by SOC, among patients with immunology conditions currently treated with an IV biologic medication.

Method: Semi-structured telephone interviews were conducted with 405 patients. Sites of care were categorized as: rheumatologist in-office infusion (rheum IOI), gastroenterologist in-office infusion (gastro IOI), hospital outpatient department (HOPD), or infusion therapy provider (ITP). Patient experience with attributes of infusion centers were rated on 7-point Likert scales (1=Poor, 7=Excellent).

Result: Of the 392 patients reporting SOC information, 154 (39.3%) received infusions in rheum IOI, 102 (26.0%) in gastro IOI, 111 (28.3%) in HOPD, and 25 (6.4%) in ITP. Rheum and gastro IOIs were more likely to receive high ratings for interaction with staff compared with HOPD. Gastro IOIs were the most likely to receive high ratings for waiting times compared to rheum IOIs and HOPD, though waiting time was still more highly rated in rheum IOIs than HOPD. HOPDs were least likely to receive high ratings for ease of parking, waiting time, interaction with staff, and expertise of staff. ITPs were most likely to receive high ratings for convenient scheduling of infusions.

Conclusion: Patient experience with specific attributes of infusion centers significantly differ by SOC. Therefore patient perceptions and experiences should be considered in choice of SOC. **Table: Patient Ratings (6 or 7 on 7-point Scale) of Attributes of Infusion Centers by SOC**

SOC Attribute	(a) Rheum IOI	(b) Gastro IOI	(c) HOPD	(d) ITP
Convenient location	61.7%	60.8%	59.5%	60.0%
Easy to get there	64.3%	66.7%	69.4%	64.0%
Free parking	87.4%[bc]	76.5%	67.0%	84.0%
Ease of parking	83.4%[c]	75.5%	66.1%	88.0%[c]

Waiting time	77.9%[c]	89.2%[ac]	54.1%	76.0%[c]
Interaction with staff	93.5%[c]	93.1%[c]	82.0%	88.0%
Handling insurance coverage and paperwork	90.9%[c]	88.2%	83.8%	84.0%
Convenient scheduling	80.5%	82.4%	87.4%	96.0%[ab]
Expertise of staff	94.1%[c]	94.1%[c]	85.6%	96.0%[c]

[abcd]p<0.05 when compared to group with listed column letter

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53. VARIATION AMONG US STATES IN INPATIENT COST OF DIABETES-RELATED LOWER EXTREMITY AMPUTATION: IS THERE A REGIONAL PATTERN? (ESP)

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Purpose: To assess across-state variation in inpatient cost of diabetes-related lower extremity amputation (DLEA) in relation to patient, hospital and state factors.

Method: Patient age, gender, race, length of stay, level of amputation, in-patient mortality, co-morbidities index, primary payer, hospital size, hospital volume of DLEA surgery, type of hospital (rural, urban non-teaching, and urban teaching) and cost were were obtained from the 2007 Healthcare Cost and Utilization Project (HCUP). State average personal income, percentage of the population below the poverty line, and population density were obtained from the U.S. Census Bureau. The number of hospital beds per 10,000 residents, number of physicians per 10,000 residents, hospital admissions per 1,000 residents and average malpractice cost were obtained from the Kaiser Family Foundation website. Three-level hierarchical linear regression models were implemented to analyze the association between in-patient cost and independent variables. The clustering effects of patients within hospitals and those of hospitals within states were captured by random effects of the intercepts. The regional patterns of unexplained cost variation were compared with that of the raw cost variation.

Result: There were 9,066 DLEA hospitalizations and thirty-nine states had cost data. The mean cost per in-patient stay was $17,103, which is $6,180 less than the costliest state (NY). Four out of the five most costly states were adjacent coastal states (NY and NJ, CA and OR). In the regression analysis, age, race, length of stay, level of amputation, in-patient mortality, primary payer, co-morbidities and type of hospital were statistically significant and explained 55.3% of the variance. The means of cost unexplained by those factors showed the most costly states were the three west coast states followed by five midwestern states and the least costly states were four southern states and the adjacent Kansas. However, after controlling for the significant state-level variable (hospital beds supply), this pattern became less clear. Since we found that the greater number of hospital beds per 10,000 residents was related to lower inpatient cost, the aforementioned pattern can be partially attributed to the different level of hospital bed availability across states.

Conclusion: We found there were some regional patterns of costs unexplained by patient and hospital factors. Further research is needed to examine whether similar patterns exist for other costly surgical procedures.

54. THE POTENTIAL OF EARLY MODELING OF NEW TECHNOLOGIES TO HELP INFORM DECISION-MAKING (ESP)

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Purpose: The objective of a publicly-funded health service is to maximise health from the available resources whilst minimising opportunity cost. Decision-makers make judgments about the relative advantages of using a new technology and choices need to be made regarding the alternative uses of health care resources. Economic evaluation can help setting these priorities and allocating resources. We advocate that consideration of economic measures and economic analysis should be incorporated at every level of the development of the evidence-base of a technology. Using a case-study, we postulate that early modeling may help inform decision-making and whether further research will be worthwhile.

Method: Using interventional treatments for snoring we assessed the feasibility of providing effectiveness and cost-effectiveness estimates. Methods included linear exponential models to extrapolate long-term data from primary studies and Markov decision models estimating life time costs and benefits.

Result: It was possible to generate information that allowed extrapolation of outcomes to the longer-term, extend the analysis to relevant comparators and provide a focus for future data collection. Three questions were addressed: -given that decision-makers decide that a treatment for snoring should be offered to patients, which one is worthwhile introducing? -given the available evidence on effectiveness and cost-effectiveness, should decision-makers consider introducing a treatment for snoring? -would further research in this area be worthwhile? Although there were limitations in the evidence-base and uncertainty surrounding the data used, the results are very stable over a range of plausible deterministic and probabilistic sensitivity analyses, meaning that it was possible to provide meaningful information.

Conclusion: Early modeling was possible and potentially useful. Although there is a time commitment associated with this task we will show that for this case-study the cost of conducting this research was worth the effort and we echo arguments that economic evaluations should be conducted 'early and often'.

55. COMPARATIVE EFFECTIVENESS OF ANTIARRHYTHMIC DRUG THERAPY IN ATRIAL FIBRILLATION: FOCUS ON CARDIOVASCULAR HOSPITALIZATION AND MORTALITY OUTCOMES (ESP)

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Purpose: The objective of this systematic review was to evaluate the evidence for the effect of antiarrhythmic drug (AAD) therapy on CV hospitalization and CV mortality in atrial fibrillation (AF).

Method: We searched the MEDLINE, EMBASE and Cochrane Clinical Trial Registry databases to identify English-language articles investigating the effects of AADs on outcomes of cardiovascular (CV) hospitalization and CV mortality. Studies were not restricted by year of publication; the earliest included study was published in 1973. We excluded studies involving non-AF patients, patients <18 years, sample sizes <40, follow-up periods <90 days, studies of non-comparative design, and reports of previously

published data. Study quality and applicability was assessed using Agency for Healthcare Research and Quality (AHRQ) criteria.

Result: Of 4,557 identified articles, 38 studies met our criteria for analysis, including 21 studies [19 randomized controlled trials (RCTs)] with the endpoint of CV hospitalization and 29 studies (24 RCTs) with the endpoint of CV mortality. Among these 38 studies, there was wide variation in definition of CV endpoints. 13 of 38 studies (34%) compared multidrug strategies of rate- versus rhythm-control, while 19 of 38 (50%) studies evaluated individual AADs. Among the few studies examining the effect of individual AADs on CV hospitalization (n=5), the ATHENA trial of dronedarone was rated as the highest quality study. There were no studies comparing head-to-head treatment effects of individual AADs on CV hospitalization. A large proportion of excluded articles evaluated outcomes of AF recurrence rather than CV hospitalization or CV mortality.

Conclusion: Despite a large number of observational studies and RCTs of AADs in AF, few studies have examined treatment effects on CV hospitalization and CV mortality. The applicability of the identified studies is limited by comparisons of multidrug strategies and wide variation in CV endpoint definitions. We identified no studies with head-to-head efficacy or effectiveness comparisons of individual AADs for CV hospitalization. The limited evidence for the impact of individual AADs on CV hospitalization and CV mortality prevents meaningful assessment of the comparative effectiveness of individual AADs.

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56. SURVIVAL-BASED QUALITY OF LIFE ASSESSMENTS (ESP)

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Purpose: To develop a Survival-based Quality of Life Assessment (SQLA) process based on clinically relevant tradeoffs, for use in supporting bedside decisions.

Method: Three small studies were done. (1) 6 electronic cigarette users (vapers) evaluated quality of life with monocular blindness, binocular blindness, current health, and forced return to smoking in a survival curve trading task comparable to a time trade-off or standard gamble. Subjects answered 2 comprehension questions and then selected an indifference curve from 7 rainbow color-coded survival curves representing alternatives to a status-quo black dashed curve. (2) A convenience sample of 17 subjects ranked 4 potential mixed graphic and screen interfaces for SQLA assessments, including an introduction, two text choices and (A) two *separate* curves, (B) superimposed *dashed* and solid curves, (C) the dashed interface with text *labels*, or (D) superimposed curves distinguished by pastel *colors* matched to choices. (3) A procedure was developed for calculating a fixed discount rate and a fixed utility for a health state from the results of two straight-line survival curve trading tasks.

Result: (1) Vapers answered 83% of comprehension questions correctly, with no errors off by more than one curve. None reversed the expected preference of monocular over binocular blindness. However, vapers gave and cogently defended the usual range of preferences, some valuing blindness close to perfect health, while others valued it close to quick death. Most vapers matched smoking to the same curve they chose for blindness, and the remainder matched it to the next better curve. (2) *Colors* was significantly preferred to *labels*, which was preferred to *dashes* and *separate* ($p<0.001$). *Colors* was the first or second choice for all subjects. (3) Given a linear survival curve with maximum survival time T_2 in a health state with utility u, if T_1 is the maximum survival time in the equivalent perfect health survival curve, and the discount rate is x, then $u = (((1/(1+x))^{T1})*1/T_1 - (\ln(1/(1+x)) + 1/T_1))/(((1/(1+x))^{T2})*1/T_2 - (\ln(1/(1+x)) + 1/T_2))))$ If x is

unknown, performing two assessments of one health state using different T_2 levels permits calculation of x and u.

Conclusion: SQLA tasks are feasible. A human interface comprising superimposed, color-coded survival curves is preferable to some alternatives. Utility and discount rate can be distinguished, if assumptions about their stability hold.

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57. CAN DECISION TREE ANALYSIS BE USED TO IDENTIFY THE OPTIMAL EVENT PATHWAY TO REACH AN ACCURATE DIAGNOSIS? THE MAZE OF CARE STUDY IN OVARIAN CANCER (ESP)

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Purpose: There are no screening or early detection tests for ovarian cancer, representing a major challenge to accurate diagnosis. The current study explored the use of capturing and analyzing health care (HC) events within the pathways followed by individual patients leading to a definitive diagnosis.

Method: Women who were referred to gynecologic oncology for a suspected ovarian cancer (OC) were enrolled to this study and recalled their HC experiences in a semi-structured interview. Complete medical records (MRs) from all HC providers were obtained from the time the patient recalled suspecting a health issue through the time of diagnosis. We conducted a preliminary analysis using decision tree analysis to identify the optimal path to a rapid diagnosis incorporating both time and HC events. HC cost will be incorporated in the full model.

Result: Of the 105 women who were enrolled to the study and provided medical record access, 92 eligible patients completed the interview about their experience in the HC system. Most of the HC encounters during this process were with primary care physicians (24.4%) and gynecologists (18.1%). More than 19% of patients did not report seeing a gynecologic oncologist prior to the diagnosis of ovarian cancer. The pathways originating from PCPs averaged 3.7 HC visits in 73 days prior to diagnosis (range 2-8 visits, 0-435 days). Time was significantly different between treatment pathways (p=0.003). Other common pathways averaged 2.8 visits in 62 days (for visits initiated in the emergency room or urgent care), and 3.2 visits and 64 days for care originating with a gynecologist. Women diagnosed with ovarian cancer had an average of 3.3 HC encounters over an average of 83 days whereas women with benign conditions had an average of 3.7 encounters over an average 104 days prior to diagnosis. Medical records will be used to validate patient-reported events and for additional information about tests and procedures completed.

Conclusion: Although most women present to their PCPs with symptoms and concerns that ultimately lead to referral to gynecologic oncology for a suspected OC, the PCP pathway was associated with the longest time to reach diagnosis, but not with additional health care visits. Additional tasks occurring at each event (e.g. blood work, scans) will be included in the full analysis to explore the expected costs of each pathway.

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58. BIOLOGIC EXPERIENCE AND SYSTEMIC MEDICATION USE AMONG COMMERCIALLY INSURED PSORIASIS PATIENTS RECEIVING USTEKINUMAB (ESP)

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Purpose: Ustekinumab (UST) was FDA-approved for use in moderate to severe plaque psoriasis (PsO) on September 25, 2009. Historical biologic use and evidence of concomitant systemic medications may be indicators of PsO disease severity from a payer perspective. Total annual treatment, monitoring, and office visit costs associated with systemic medications may range from $1,197 (methotrexate) to $17,613 (acitretin).[1] No real-world observational data have been published, thus far, examining biologic experience or concomitant systemic medication use of PsO patients receiving UST. The purpose of this study was to describe the biologic experience and concomitant systemic medication use of PsO patients initiating UST.

Method: IMS LifeLink™ database was utilized to analyze patients with an index medical/pharmacy claim of UST therapy initiated 09/25/2009-12/31/2009. Inclusion criteria: patients aged $\geq$ 18 years at index, $\geq$ 1 PsO diagnosis code, and $\geq$ 360/180 days pre-/post-index continuous enrollment. Systemic medications included acitretin, azathioprine, cyclosporine, mercaptopurine, methotrexate, mycophenolate mofetil, and sulfasalazine.

Result: A total of 112 PsO patients receiving UST were identified from LifeLink™. Mean (SD) age was 46 (11) years; 56% were male. The majority (68%; n=76) of patients had pre-index biologic experience. Among the biologic-experienced, 41% received adalimumab, 38% received etanercept, 24% received infliximab, 17% received efalizumab, and 8% received alefacept pre-index. Prior to UST, 49% (n=37) of biologic-experienced patients received biologic and systemic medications. After initiating UST, 12% of UST patients received concomitant systemic medications. Methotrexate, cyclosporine, and acitretin were the only systemic medications observed in the pre-or post-UST period.

Conclusion: The majority of patients receiving UST were biologic-experienced. Systemic medication use was evident in nearly half of all biologic-experienced PsO patients prior to UST, but only in approximately 1 in 10 patients after initiating UST. Further research is necessary in a larger sample size, while controlling for baseline clinical and economic factors. Additionally, the safety of concomitant use of ustekinumab with immunosuppressants has not been evaluated. Lastly, an evaluation of the impact of biologic experience on UST dosing and the economic impact of UST on use of other PsO medications is warranted. [1] Beyer V and Wolverton SE. Recent Trends in Systemic Psoriasis Treatment Costs. *Arch Dermatol.* 2010;146(1):46-54.