Check for updates

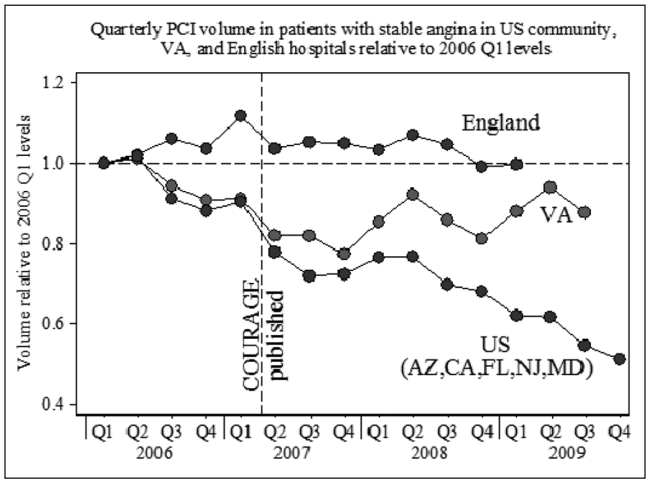
33rd Annual Meeting of the Society of Medical Decision Making:

2011 Abstracts

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.

Result: 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.

Conclusion: 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 organizations).



ESP-20 CAN HEMOGLOBIN A1C TESTING BE COST-EFFECTIVE IN MALAWI?

(ESP)—Applied Health Economics, Services, and Policy Research

ABSTRACT WITHDRAWN

Purpose: Chronic disease management in Sub-Saharan Africa (SSA) is currently limited by poor resources. In Malawi, diabetes is managed with a quarterly fasting blood sugar (FBS). Hemoglobin A1C (A1C) is a more accurate indicator of glycemic control over the previous 6-12 weeks and may allow better diabetes control through more timely medication adjustment and lifestyle education. The cost-effectiveness of using A1C in Malawi is unclear; based on World Health Organization recommendations an acceptable ICER for implementing A1C testing would be $2280/QALY gained.

Method: To determine the impact required for implementation of A1C testing to be considered cost-effective in Malawi, we used a Markov model to estimate the cost-effectiveness of quarterly FBS versus quarterly A1C to prevent diabetes complications. We used a 10-year time horizon and a health systems perspective, discounting costs and effectiveness at 3% per year. There are little data on diabetes progression in sub-Saharan Africa, so we used the UKPDS Outcomes Model to determine diabetes complication development rates using data on diabetics in Malawi. In the model, we used point-of-care testing for A1C, which costs $9 per test, as opposed to lab-based FBS, costing $0.50 per test. Malawian costs of diabetes treatment and complications were estimated from the International Drug Price Indicator Guide. Utilities were obtained from the medical literature.

Result: For an average patient (45yo Malawian male with 7 year history of diabetes) with a sustained 1% improvement in A1C due to use of the intervention, the ICER for quarterly A1C use is $2005 per QALY gained. If a 2% improvement in A1C was attained, the ICER would be $1459 per QALY gained. In 1-way sensitivity analyses when A1C is decreased by 1%, ICER is >$2,280/QALY if diabetes utility is <0.65 (base case: 0.689), A1C cost is >$10 per test, or if the relative risk of diabetes complications is >11% higher than projected when AIC testing is performed.

Conclusion: A1C may be cost-effective in low resource settings compared to FBS and should be considered for implementation in the national health care system in Malawi. However, further research into the epidemiology and complications of diabetes in this setting, as well as the effects of improved diabetes monitoring, is needed.

ESP-21 THE INFLUENCE OF PATIENT/PROVIDER BEHAVIOR ON THE VALUE OF ERCC1 TESTING RESEARCH IN STAGE II NONSMALL CELL LUNG CANCER

(ESP)—Applied Health Economics, Services, and Policy Research
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 nonsmall 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 2 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 $150000/QALY was used 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 $7400. 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 1000 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 were attributable to ERCC1+ and ERCC1– subgroups, 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.

ESP-22 COST-EFFECTIVENESS OF RISK-FACTOR GUIDED AND UNIVERSAL SCREENING FOR CHRONIC HEPATITIS C INFECTION IN THE US

(ESP)—Applied Health Economics, Services, and Policy Research **Shan Liu, SM**, 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 US 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 US adults (40-60 years old) at a routine medical visit.

Method: 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 3 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.

Result: 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.

Conclusion: 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 US HCV screening guidelines should be reconsidered.

ESP-23 CAROTID ENDARTERECTOMY VERSUS STENTING: A DECISION ANALYSIS

(ESP)—Applied Health Economics, Services, and Policy Research **Daniel Yavin, MD**[1], Starr Tze, PENg[2], John H. Wong, MD, MSc[1] and Garnette R. Sutherland, MD[1], [1]University of Calgary, Calgary, AB, Canada, [2]Curtin University, Calgary, AB, Canada

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 2 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 2 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.

ESP-24 WITH MORE EFFECTIVE THERAPIES, SHOULD WE SCREEN FOR CHRONIC HEPATITIS C IN THE US?

(ESP)—Applied Health Economics, Services, and Policy Research **Shan Liu, SM**, Lauren E. Cipriano, BSc, BA, PhD, Candidate and Jeremy D. Goldhaber-Fiebert, PhD, Stanford University, Stanford, CA

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 US adults (40-60 years old) at a routine medical visit.

Method: 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).

Result: 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