

identified 295 spinal injury patients, with a mean age at index of 44 years, an average follow-up time of 6 years, and of which 79% were males. For 67% of the population we observed at least one UTI, which resulted in a care contact. Interestingly, a quarter of the population used prophylactic antibiotics (J01XX05), corresponding to an average of 235 DDDs per year, amongst users. A majority of UTIs were handled in primary care, while over 90% of costs were contributed by UTI-related hospitalisations. The mean cost per UTI was 43,500 SEK, while estimates varied considerably, with costs ranging from an average of 1,800 SEK for UTIs handled in primary care to 177,200 SEK for inpatient care. **CONCLUSIONS:** In a population of spinal injury patients, costs for catheter-associated urinary tract infections are to a large extent driven by outlier, expensive hospitalisation. There would be a large potential for cost savings if these hospitalisations could be avoided.

## PMD55

## RESOURCE UTILISATION RELATED TO URINARY TRACT INFECTIONS IN SWEDISH SELF-CATHETERISATION PATIENTS

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**OBJECTIVES:** To collect real-life data on costs and resource use, in order to understand the economic burden of urinary tract infection (UTI) amongst a population who has received self-catheterisation training. **METHODS:** We used the CEBRx database, which combines data from a public claims database for the South-West region of Sweden, comprising around 1.5 million individuals, with national Swedish registers on drug utilisation and mortality. We identified a population of patients who had received self-catheterisation training anytime between 2006 and 2009 (procedure code GB005). UTIs were identified through the following ICD-10 codes: N11.0, N30\*, N39.0\*, N39.X\*, N12.-P, and N30.-P. A cost per UTI was calculated through considering UTI-related care contacts that occurred within 14 days from each other. **RESULTS:** We identified 989 patients, with a high mean age at index of 65 years, 79% males, and an average follow-up time of 1.5 years. The disease burden of this population was mainly related to the genitourinary system, like retention of urine, benign prostate hyperplasia, cystitis, and neurogenic bladder, although essential hypertension emerged as the third most common comorbidity. We observed an average frequency of one UTI every two years, while around one-fifth of patients had a yearly UTI-frequency of one or above. A majority of UTIs were handled in primary care, while around 80% of costs were contributed by UTI-related hospitalisations. However, among female patients, inpatient care only contributed to 60% of total costs. The mean cost per UTI was 10,500 SEK, while estimates varied, with average costs ranging from 2,100 SEK in primary care, to 32,000 SEK for inpatient care. **CONCLUSIONS:** Patients having received self-catheterisation training were on average of higher age and male. UTI-related hospitalisation was a clear driver of costs, although this effect was less pronounced for women.

## PMD56

## A SYSTEMATIC LITERATURE REVIEW ON THE CLINICAL AND ECONOMIC OUTCOMES ATTRIBUTABLE TO THE USE OF HEMOSTATIC MATRIX DURING TONSILLECTOMY AND ADENOIDECTOMY

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**OBJECTIVES:** Approximately 880,000 tonsillectomy/adenoidectomy procedures are performed in the US annually. Hemostatic matrix (FLOSEAL) is used for adjunctive hemostasis in a variety of surgeries, but the health economic rationale supporting its application in tonsillectomy and adenoidectomy has yet to be established. A systematic literature review was conducted in order to examine the evidence for hemostatic matrix and to consider its value in reducing the burden of these procedures. **METHODS:** Applying keywords and inclusion criteria, the PubMed, EMBASE, and Centre for Reviews and Dissemination databases were queried for studies published in English up to March 1, 2011. Reference lists and the American Academy of Otolaryngology-Head and Neck Surgery database were also manually searched. Data on costs, resource utilization, and health outcomes were extracted and summarized. **RESULTS:** Four prospective, randomized controlled trials provided data on 187 patients treated with hemostatic matrix. In the two studies utilizing crossover design, no patients in the hemostatic matrix groups required electrocautery, whereas 3 of 35 (9%) and 4 of 34 (12%) patients, respectively, required adjunctive hemostatic matrix intraoperatively after failing electrocautery. In all three studies measuring operating room time, use of hemostatic matrix resulted in significantly shorter mean durations (range, 0.93 to 24.6 minutes) compared to electrocautery (range, 9.53 to 32.6 minutes) (all studies, P<0.05). Although postoperative bleeding rates did not differ, hemostatic matrix-treated patients in three of four studies reported significant reductions in postoperative pain scores and narcotic consumption compared to electrocautery-treated patients (P<0.05). **CONCLUSIONS:** Published evidence suggests that hemostatic matrix is effective in achieving intraoperative hemostasis during tonsillectomy/adenoidectomy. Given the high volume of procedures, using hemostatic matrix during tonsillectomy and adenoidectomy may be potentially cost saving due to resulting reductions in operating time and postoperative narcotic consumption. Further research may identify patients who are more likely to benefit from hemostatic matrix in this indication.

## PMD57

## DATA VISUALIZATION FOR BUSINESS INTELLIGENCE: ASSESSING AN ONLINE TOOL USED FOR BENCHMARKING HOSPITAL PROCEDURE COSTS TO REIMBURSEMENT IN CARDIAC CATHETERIZATION AND ELECTROPHYSIOLOGY PROCEDURES

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**OBJECTIVES:** Data visualization as a form of business intelligence and knowledge discovery will democratize the use of large scale payer/claims and electronic medical records databases. The goal of this analysis was to assess the feasibility of utilizing Tableau Software™ to create a data visualization tool that would augment data mining and analytic methods for understanding hospital costs and reimbursement patterns in cardiac catheterization and electrophysiology procedures. **METHODS:** The Premier Perspective® database was utilized for this analysis. The Premier Perspective® database houses data from over 600 hospitals and ambulatory surgery centers across the United States. Eligible procedures were those that occurred during the year 2010 with the associated ICD-9 or CPT codes for either cardiac catheterization or electrophysiology procedures. All data were imported into Tableau Software™ and dashboards were created to visualize the data by procedure costs and department costs. Summary statistics of hospital utilization, total costs, components of costs, and hospital charges for both inpatient and outpatient settings are available for exploration in a dynamic manner by each quarter in 2010. Each dashboard is hosted in a secure online environment and fully interactive allowing for dozens of different filters to be applied. **RESULTS:** For the year 2010 there were 1,104,936 visits of cardiac related procedures With 164,210 unique cardiac catheterization procedures and 22,263 cardiac electrophysiology procedures. Custom developed dashboards show procedures (and associated volumes) by in- and out- patient status, by ICD-9 or CPT code, department, costs and CMS reimbursement levels. This data visualization tool makes it possible to quickly see hospital cost breakdowns on dozens of different dimensions. **CONCLUSIONS:** Tableau Software™ is a powerful tool to enable the health outcomes researcher to have insights into complex multilevel data. Business intelligence tools developed in this manner enable visual interaction and exploration of data for rapid hypothesis generation and business intelligence.

## Medical Device/Diagnostics – Patient-Reported Outcomes &amp; Preference-Based Studies

## PMD58

## PROVISION AND FINANCING OF MEDICAL AIDS IN THE MANAGEMENT OF RARE DISEASES: THE CASE OF AMYOTROPHIC LATERAL SCLEROSIS (ALS)

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**OBJECTIVES:** Patients suffering from ALS have a need for a multitude of medical aids. Existing (bureaucratic) hurdles might create plenty of problems for people with rare diseases. Uncertainty about provision of medical aids and substantial waiting times limit patient's ability to participate in the activities of daily living. This study aims 1) to analyze problems in financing and provision of medical aids; 2) to explore differences in reimbursement decisions of private and social health insurance (SHI); and 3) to explore patient satisfaction according to the type of health insurance. **METHODS:** First, published and grey literature was used to analyse payment flows and supply chain activities of the various actors involved in the provision and payment of medical aids. Second, a survey of ALS patients (n=20) based on semi-standardized questionnaires was conducted. Gathered information included patients' demographic characteristics, information on coverage decisions and problems in the provision of medical aids. Based on patient satisfaction, analysis of variance tests were performed to investigate differences in satisfaction between SHI and privately insured persons. **RESULTS:** A majority of patients experienced problems in reimbursement decisions, particularly in the case of expensive or individually customized technologies. These reimbursement problems were more common among SHI insured persons. Both SHI insured and privately insured persons complain about long duration processes of individual requests for meeting the cost. Nonetheless, most patients stated that they were satisfied with the actual provision of medical aids, including product and service quality. **CONCLUSIONS:** Our results suggest that difficulties with medical aids' reimbursement decision processes are a common problem among SHI and private insured ALS patients. Although the patient's insurance type has an impact on these time-consuming process. Consequently, there is a need for an interdisciplinary approach in the provision of medical aids. Case managers might be a solution to overcome these problems.

## PMD59

## COMPLICATED PARKINSON'S DISEASE: DISCRETE CHOICE ANALYSIS TO ASSESS PATIENTS' PREFERENCES. A PILOT STUDY

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**OBJECTIVES:** In advanced or complicated Parkinson's disease (CPD), among other treatment alternatives, patients can receive deep brain stimulation (DBS) or continuous duodenal levodopa-carbidopa infusion (CDLCl). This pilot study was designed to understand the preferences of patients who face these treatment choices. **METHODS:** Treatment attributes were identified based on a literature review, focus groups with patients, caregivers, and interviews with clinicians. A discrete choice experiment survey was developed, reviewed by clinicians and piloted with patients. Patients (potentially considering DBS or CDLCl) in Spain (n=30) and the UK (n=10) completed the survey. Treatment attributes included surgery type, impact on daily life, medication need, speech difficulties, movement control, dyskinesia, and off-periods. Data were analyzed using a multi-level hierarchical logistic model. **RESULTS:** Surgery type (DBS electric lead insertion in the brain vs CDLCl intraduodenal tube placement) was the most powerful predictor in the model, with a pref-

erence for DBS over CDLCI (OR= 8.02, 95% CI=6.17-10.38). Avoiding deterioration in movement was also important in determining treatment choice (OR=0.67; 95%CI=0.57-0.79) as was avoiding limitations on daily activities; (OR=0.69; 95%CI=0.54-0.88). **CONCLUSIONS:** CPD patients were able to engage in this quite complex task to indicate their views regarding treatments. Participants had a preference for DBS surgery type. Maintaining movement and daily activities were also important attributes. As the surgery attribute was a composite of both surgical procedure and daily maintenance, further study is needed to identify which of these aspects is the strongest predictor of patient preferences. Finally, a larger study is needed to understand the importance of attributes for all the treatment alternatives that can be offered to CPD patients

#### PMD60

##### DEVELOPMENT AND CONTENT VALIDITY OF THE COPD DEVICE PREFERENCE QUESTIONNAIRE

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**OBJECTIVES:** To develop and subsequently evaluate content validity of questions assessing patient preference between two dry powder inhaler (DPI) devices (the Handihaler and the Novel DPI) for the treatment of chronic obstructive pulmonary disease (COPD), based on ease of use. **METHODS:** Initial COPD Device Preference Questionnaire (CDPQ) items were designed to assess inhaler device preference based on aspects of ease of use identified as important by COPD patients and physicians during previous research. Two iterative rounds of semistructured, in-depth interviews were conducted in adult patients currently receiving COPD medication via the Handihaler. Initially, patients were asked to describe the actuation of the Handihaler. Next, the features and steps required to operate the Novel DPI were described, and participants were asked to demonstrate using an empty device. Cognitive debriefing of the CDPQ was then conducted. Patients completed and evaluated five items, each phrased two different ways (beginning with "which..." or "thinking..."). Round 1 interviews (n = 8) gathered feedback on preferred phrasing and modifications required to improve the CDPQ. Round 2 interviews (n = 8) assessed modifications and gathered additional input to confirm content validity. All interviews were recorded and transcribed for analysis. **RESULTS:** Round 1 interviews resulted in addition of instruction detail, modification of questions based on a clear preference for the "which" phrasing, and removal of two items (i.e., understanding how to use the device and number of steps involved in preparing the device) deemed duplicative. Round 2 interviews did not result in additional changes. Participants found instructions, items, and response wording easy to understand and complete. An item-tracking grid was constructed to summarize item changes and their rationales. **CONCLUSIONS:** Participant feedback indicates that the concepts of greatest importance in determining COPD inhaler device preference related to ease of use were reflected in the final CDPQ items.

#### PMD61

##### THE EFFECTS OF SUBJECTIVE INSOMNIA PATTERN ON THE QUALITY OF LIFE OF THE CLIMACTERIC WOMEN IN TAIWAN

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**OBJECTIVES:** Sleep issues are relevant to women across their whole lifespan and this is especially true during the climacteric period. Previous studies have demonstrated that insomnia influences quality of life (QOL) across various different domains. However, the different characteristics of the insomnia that influences the QOL remain unclear. Our study was designed to investigate which type of insomnia influences the health-related quality of life amongst women. **METHODS:** A total of 1098 women age between 40-60 years seeking medical advice were drawn from two hospital, with a further 314 healthy referents of the same age, range and gender, with no history of hormone replacement therapy and living in the same municipality, also being recruited from a national health survey sample for comparison. Each one was asked to fill out a brief questionnaire, the Taiwan version of the World Health Organization Quality of life (WHOQOL-BREF), which assesses quality of life based on 26 items in four domains (physical, psychological, social and environmental). In addition, the Pittsburgh sleep quality index (PSQI) was used to evaluate the sleep quality and insomnia pattern of the subjects. Multiple regression analyses were conducted to control variables such as age, marital status, religion, educational attainment and menopausal status. **RESULTS:** The mean total score of the PSQI was 7.5 ± 3.8 with a range from 0-20. In the 1098 participants, 65.3% (n=717) were confirmed to be poor sleepers, and 34.7% (n=381) were good sleepers. After controlling for the demographic factors, it was found that subjective poor sleep quality and daytime dysfunction were the major determinants of the scores in the different domains. **CONCLUSIONS:** A high incidence of poor sleep quality exists among climacteric women in the urban area of Taiwan and subjective poor sleep quality and poor daytime function should be taken into consideration in the management of climacteric women seeking medical advice.

#### PMD62

##### VALIDATION OF A PATIENT-REPORTED OUTCOME (PRO) MEASURE AND A CLINICIAN-REPORTED OUTCOME (CRO) MEASURE TO ASSESS SATISFACTION AND PREFERENCE WITH PHARMACOLOGICAL STRESS AGENTS FOR SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY (SPECT) MYOCARDIAL PERFUSION IMAGING (MPI)

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**OBJECTIVES:** The objective of this study was to validate clinician and patient measures of satisfaction and preference for pharmacological stress agents (PSAs) used in Single Photon Emission Computed Tomography (SPECT) Myocardial perfusion imaging (MPI) procedures using classical and novel psychometric methods. **METHODS:** Psychometric validation of the Clinician Satisfaction and Preference Questionnaire (CSPQ) and the Patient Satisfaction and Preference Questionnaire (PSPQ) was conducted in a sample of 90 patients and 15 clinicians. Due to the small sample size, a Bayesian Item Response Theory was utilized to validate the initial parameter estimates. Specifically, item difficulty was evaluated using patient characteristics as the known prior distributions. **RESULTS:** The CSPQ demonstrated strong internal consistency (alpha=0.99) and moderate point-biserial correlations between PSA satisfaction scores and agent preference (range 0.63-0.65). The PSPQ 'preparation' and 'reaction to agent' scales demonstrated strong internal consistency (alpha=0.90 and 0.87 respectively). Test-retest reliability was acceptable for all PSPQ scales (ICC range=0.73 to 0.86). Concurrent validity with the Treatment Satisfaction Questionnaire for Medication (TSQM) indicate low to moderate correlations between the Effectiveness, Convenience and Global Satisfaction scales of the TSQM with the PSPQ Satisfaction with Administration, Satisfaction with Effects and Overall Satisfaction items (range 0.46 to 0.78). The results of the Bayesian analysis indicated consistency between the two approaches. Specifically, item difficulty was invariant across the various patient demographics. **CONCLUSIONS:** The CSPQ and PSPQ were developed and validated using rigorous, gold standard methodology. The resulting instruments sufficiently represents meaningful domains demonstrate strong internal consistency, good test-retest reliability, and predictive validity associated with clinician and patient measures of satisfaction and preference for pharmacological stress agents (PSAs) used in Single Photon Emission Computed Tomography (SPECT) Myocardial perfusion imaging (MPI) procedures. The variance in the item parameters were fully explained by the summary demographic information on the patients and physicians as supported by the Bayesian analysis.

#### Medical Device/Diagnostics – Health Care Use & Policy Studies

#### PMD63

##### COST-BENEFIT ANALYSIS OF CT CONTRAST MEDIA (IOPROMIDE) WITH PREFILLED CARTRIDGE TYPE COMPARED TO GLASS BOTTLE TYPE

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**OBJECTIVES:** In CT imaging, as preparation procedure for contrast media (Iopromide), the use of prefilled cartridge (PFC) is simpler compared to glass bottle (GB). There are several benefits such as infection control and time saving. This study examined the benefits of contrast media with PFC compared to GB. **METHODS:** The benefits are defined as the cost savings which can occur when used in various situations. A decision analytic model was created to evaluate the effectiveness according to the type. The use of each type could finally lead to local infection and blood stream infection (BSI). We estimated the benefits using the probability of infection from decision model and treatment costs from insurance claims data. To estimate the benefits of time saving, we measured the preparation time repeatedly in general hospitals. Assuming that the reduced time was replaced with CT scan in new patients, we estimated the time saving benefits by multiplying the result to the cost of CT scan. **RESULTS:** The material cost of GB was \$74.8 which is higher than \$72.9 of PFC. In contrast, in case of GB, the probability of contamination, local infection and BSI were 3.3%, 1.25%, 0.060% respectively, which were higher than PFC (0%, 1.22%, 0.058%). The benefit in reduction of infection was estimated at \$0.20 per case in PFC. The reduced time from using PFC has an average of 51.9 seconds based on 113 observations from 3 general hospitals. The time saving benefit was estimated at \$7.16 per case. Therefore, the total benefit was estimated at \$7.36. **CONCLUSIONS:** This study showed that PFC dominated GB (lower costs, and higher benefits). This was driven by lower material cost, lower infection risk and administration time for PFC compared to GB. Findings of this study suggest that the use of PFC contrast media is an efficient utilization of resources in Korea.

#### PMD64

##### THE EFFECT OF SUPPLEMENTARY FEES ON THE DIFFUSION OF MEDICAL DEVICES IN THE GERMAN SYSTEM OF DIAGNOSIS RELATED GROUPS (G-DRG): THE CASE OF DRUG-ELUTING STENTS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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**OBJECTIVES:** The aim of the study was to measure the effect of supplementary fees on the use of drug-eluting stents (DES) in AMI patients instead of conventional bare-metal stents (BMS). German DRG fees do not distinguish between different types of coronary stents. To compensate hospitals for higher costs of DES, supplementary payments could be negotiated between the hospital and the sickness funds. **METHODS:** Administrative data of one of the largest German sickness funds was used to identify the determinants of DES use in AMI patients. The dataset contained information on demographic characteristics and co-morbidities on patient level. Information on hospital and regional level including the supplementary fee for the use of DES was merged. 9,453 patients with an admission due to an AMI and the implantation of a BMS or DES between 2004 through to 2006 were included in the analysis. For analyzing the data, a logistic multilevel regression approach was used; the dependent variable was binary, taking the value of 1 if a DES was implanted and 0 if a BMS was implanted. In the regression, a comprehensive set of covariates on patient level as well as variables on hospital and regional level were included. To test robustness of the estimation, several models were estimated.