

PMS25 CLINICAL VALIDATION OF A BUDGET IMPACT MODEL USING THE ESTABLISHED KEY OPINION LEADER VALIDATION FRAMEWORK (KOLVF)

Tremblay G,¹ Azimpour K,² Groff M¹

¹Purple Squirrel Economics, New York, NY, USA, ²Purple Squirrel Economics, Montreal, QC, Canada

Objective: Clinical validation is considered a necessary component of any modeling in health economics (HE). Previously, we established a practical framework for the clinical validation of HE models (KOLVF) (Azimpour K. et al. 2019). The current research objective was to generate a case study to demonstrate the usefulness of the applying the KOLVF for the clinical validation of a budget impact model (BIM). We chose a new medical device developed to improve the management of osteoarthritis (OA) to present our findings. **Methods:** In concordance with KOLVF, three rounds of consultations were performed involving three clinical experts. The first occurred at the model conceptualization to gain insight on clinical situations, relevant target populations, treatment pathways, and feasible comparators. The second was conducted after initial input of real-world evidence and clinical trial data into the model, to solicit clinical advice on necessary model adjustments. The last consultation was performed after obtaining the results to detect if all the relevant questions were addressed transparently by the model. **Results:** Following the KOLVF protocol, the OA severity index used in the model was challenged, and the key opinion leaders (KOLs) helped to refine the segmentation of patients. Moreover, the outcomes of treatment were redefined as the adherence to current treatment and the need for total knee arthroplasty. Additional data gaps were validated, and some assumptions were also confirmed or slightly modified by the KOLs. In the final step of the process, the KOLs ensured the results were consistent with real-world practice. **Conclusion:** The KOLVF provided a straightforward and thorough protocol for KOL involvement. Efficient use of time when clinically validating a model is key to achieving the full benefits of KOL advice. With proper application of the KOLVF, the process benefited from improved validation quality and reduced KOL time, yielding valuable input in a time- and budget-efficient manner.



PMS26 ANNUAL HEALTH INSURANCE TREATMENT COST OF INJURIES TO THE KNEE AND LOWER LEG BASED ON ROUTINELY COLLECTED REAL-WORLD FINANCING DATA

Varga V,¹ Molics B,² Gazsó T,¹ Kajos L,¹ Szöts B,¹ Danku N,¹ Endrei D,¹ Horváth L,¹ Sebestyén A,¹ Boncz I¹

¹University of Pécs, Pécs, Hungary, ²University of Pécs, Pécs, BA, Hungary

Objectives: Injuries to the knee and lower leg cause a significant burden for the individual and society. Our aim was to determine the annual health insurance treatment cost of knee and lower leg injuries in Hungary. **Methods:** Data were derived from the financial database of the NHIFA, for the year 2018. Data analysed included annual health insurance costs, patient numbers and cost distribution calculated for age groups and sex. The following cost categories were included into the study: general practice care, home care, in- and outpatient care, medical imaging, laboratory diagnostics, pharmaceuticals and medical aids. Patients with knee and lower leg injuries were identified with the following code of the International Classification of Diseases 10th revision: S80-S89. **Results:** In 2018, the Hungarian National Health Insurance Fund Administration spent 8.808 billion Hungarian Forints (HUF) on the treatment of patients with knee and lower leg injuries [32.59 million American Dollars (USD), or 27.62 million Euros (EUR)]. 52.0% of costs was spent on the treatment of male, while 48.0% on female patients. The highest patient numbers were in outpatient care: 106,058 men (50%), and 106,234 women (50%), in total 212,292 patients. Acute inpatient care (62.6% of total health insurance costs in men, 60.1% in women), outpatient care (22.1% in men, 22.7% in women) and medical aids (6.5% in men, 5.5% in women) were the main cost drivers, all other forms of medical care amounted to 8.8% in men, 11.7% in women. Annual health care treatment cost per patient was 43,203 HUF (160 USD/135 EUR) in men and 39,784 HUF (147 USD/125 EUR) in women. **Conclusions:** Acute inpatient care was the major cost driver. There was no significant difference in major cost drivers between men and women. Average, annual health insurance costs per patient was 8.5% higher in men than in women.



PMS27 CONCEPTUAL FRAMEWORK FOR ECONOMIC EVALUATION OF KNEE KINESIOGRAPHY FOR THE MANAGEMENT OF KNEE OSTEOARTHRITIS

Azimpour K,¹ Tremblay G,² Hagemeister N,³ Cagnin A,³ Fuentes A⁴

¹Purple Squirrel Economics, Montreal, QC, Canada, ²Purple Squirrel Economics, New York, NY, USA, ³Research Centre of the Centre Hospitalier de l'Université de Montréal (CHUM), Montreal, QC, Canada, ⁴Emovi Inc., Montreal, QC, Canada

Objectives: Improved assessment of knee function would support the conservative management of knee osteoarthritis (OA). Knee kinesiology (KneeKG) is a new dynamic exam assessing biomechanical risk factors for OA progression. In a multi-arm cluster randomized clinical trial, significant improvements on clinical symptoms, pain, and daily activities in the Knee Injury and Osteoarthritis Outcome Score (KOOS) were reported in both KneeKG groups (all $p < 0.05$) (Cagnin A. et al. 2019). The present study aimed to introduce a conceptual framework for assessing the



economic value of the KneeKG in the management of knee OA in a primary care setting. **Methods:** Findings from the clinical trial and a targeted literature review were used to inform the KneeKG model framework conceptualisation. We compared three global care strategies (current medical management [CMM], CMM+KneeKG, and CMM+KneeKG+Education), as was done in the clinical trial. The expert panel consisted of Health Technology Assessment specialists and clinicians to guide key decisions in model design. The clinical and safety outcomes, health states, technical assumptions, economic endpoints, and costs were evaluated to identify the key value drivers to optimize the development of the proposed models. **Results:** OA severity index was used to define the health states based on the clinical validation. The severity of knee OA was defined by the Kellgren and Lawrence grading system where grades 2, 3, and 4 are mild, moderate, and severe. The outcome was defined as global care strategies adherence, and the related costs. Costs were estimated for diagnostic tests, drugs, routine care, complications, adverse events, productivity costs, and mortality. **Conclusions:** The clinical effectiveness of the KneeKG exam in the conservative management of knee OA was previously reported. Based on clinical trial and targeted literature review, a health economic model was designed to evaluate the KneeKG.

PMS28 COST-UTILITY ANALYSIS OF TREATMENT OPTIONS AFTER INITIAL TUMOR NECROSIS FACTOR INHIBITOR THERAPY FAILURE IN PATIENTS WITH RHEUMATOID ARTHRITIS

Karpes Matusевич AR,¹ Lal L,² Wenyaw C,¹ Swint JM,¹ Cantor SB,³ Suarez-Almazor ME,³ Lopez-Olivo MA³

¹University of Texas Health Science Center at Houston - School of Public Health, Houston, TX, USA, ²University of Texas Health Science Center at Houston - School of Public Health, Missouri City, TX, USA, ³University of Texas M.D. Anderson Cancer Center, Houston, TX, USA

Objectives: To use real-world data to analyze the cost-utility of sequences of therapeutic drugs used by rheumatoid arthritis patients whose initial tumor necrosis factor inhibitor therapy failed. **Methods:** We developed a microsimulation Markov model to analyze 10,000 rheumatoid arthritis patients (80% female, mean age 52yrs) beginning their second biological treatment with adalimumab (cycling) or abatacept (swapping) and followed them for 10 years or until death. Patients not responding switched to the next drug in a sequence of three (adalimumab-abatacept-tocilizumab versus abatacept-tocilizumab-rituximab) and then shifted to palliative treatment. Demographics, the most common drug choice per cycling or swapping cohorts, subsequent treatment sequences, direct medical costs, and transition probabilities were derived from a cohort of rheumatoid arthritis patients in the 2008-2016 Truven Health MarketScan Research database. Baseline Health Assessment Questionnaire Disability Index (HAQ-DI) were derived from an age-adjusted comorbidity index and converted to utilities using the formula from the Birmingham Rheumatoid Arthritis Model. Scenario analysis was used to vary the time horizon, utility formula and baseline HAQ-DI. We also performed a probabilistic sensitivity analysis. **Results:** Swapping to a sequence beginning with abatacept showed an incremental discounted cost of \$11,357 over ten years and achieved a discounted cost per quality-adjusted life year (QALY) benefit of 0.16 compared with cycling to adalimumab. The incremental cost-effectiveness ratio of \$68,950/QALY was within current willingness-to-pay thresholds. Scenario analysis produced an incremental cost-effectiveness ratio range of \$44,573/QALY to \$148,558/QALY: abatacept was more cost-effective over longer periods of time and when baseline HAQ was lower. Probabilistic sensitivity analysis showed that swapping to abatacept after tumor necrosis factor inhibitor therapy failure had an 80.6% likelihood of being cost-effective at \$100,000/QALY. **Conclusions:** Abatacept is a cost-effective strategy for rheumatoid arthritis patients whose initial tumor necrosis factor inhibitor therapy fails. Being able to stratify patients by reason for switch would improve the validity of our conclusions.



PMS29 EARLY ECONOMIC EVALUATION DEMONSTRATES THAT ROBOTIC ASSISTED SURGERY IS COST-EFFECTIVE IN PATIENTS UNDERGOING UNICOMPARTMENTAL KNEE ARTHROPLASTY, A UK NATIONAL HEALTH SERVICE PERSPECTIVE

Nherera L,¹ Verma S²

¹Smith & Nephew, Dallas Fort Worth, TX, USA, ²Smith & Nephew, Hull, UK

Objectives: For over fifty years, unicompartmental knee arthroplasty (UKA) has been used to treat single compartment osteoarthritis of the knee and is considered a safe alternative to total knee arthroplasty (TKA). The development and use of robotic-assisted surgery (r-UKA)* has made execution of the procedure more precise and various studies have reported improved radiographic outcomes and implant survival rates, however its cost-effectiveness is unknown. This study aimed to assess the cost-effectiveness of r-UKA compared to traditional unicompartmental knee arthroplasty (t-UKA) method in patients with unicompartmental knee osteoarthritis from the UK payer's perspective. **Methods:** We developed a 5 year three Markov model to evaluate the expected costs and outcomes of the two strategies in patients aged 65 years. Failure rates for t-UKA were taken from the British National Joint Registry while data for r-UKA were obtained from a 2 year observational study. Cost were obtained from the NHS reference cost valued at 2018/19 GBP£ and a discount rate of 3.5% was applied to both costs and benefits. **Results:** For a high volume centre that performs

