

tient visit for 12 months. Annual average visit days of outpatients were 37. Annual overall costs per patient were 13.4 million Korean won (KRW), of which 10.5 million KRW (78.6%) was drug costs because of costly TNF antagonist. Inspection cost came next with 5.6% of the total costs, followed by hospitalization cost (4.6%), operation cost (4.0%), and doctor's fee (3.2%). Mean out-of-pocket expenditure was 3.7 million KRW, 27.1% of the overall costs. As age increased, so did the total costs. Male, medical aid, and patients with hospitalization or surgery were associated with significantly higher costs than female, health insurance, and inexperienced patients of hospitalization or surgery respectively ( $p < 0.05$ ). **CONCLUSIONS:** Direct medical costs per capita of RA patients receiving TNF antagonist in Korea were 13.4 million KRW. The economic burden of RA patients is strongly influenced by TNF antagonist.

## PMS17

## EVALUATING THE ASSOCIATION BETWEEN SERUM URIC ACID LEVEL AND HEALTH CARE COSTS IN PATIENTS WITH GOUT

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**OBJECTIVES:** To describe the association between serum uric acid (sUA) levels and gout-related healthcare utilization and costs. **METHODS:** A retrospective analysis was conducted using a database from a regional managed care organization. Patients with primary gout were included in the study if they met the following criteria between 2006 and 2007: (1) age  $\geq 18$ ; (2)  $\geq 1$  diagnosis of gout (ICD-9-CM 274.xx), or  $\geq 1$  prescription gout-related medications (colchicine, allopurinol, probenecid); (3) 12 months continuous eligibility pre- and post- either the first gout diagnosis or first pharmacy claim date (index date). Patients with cancer diagnoses were excluded. Patients were classified into three sUA levels based on the measurement taken on the date closest to the index date:  $< 6.0$  mg/dL, 6.0-8.99 mg/dL, and  $\geq 9.0$  mg/dL. Healthcare costs in the 12 months post index period were compared across the three sUA levels using Kruskal-Wallis tests. **RESULTS:** A total of 1,622 patients were identified; 374 (23.0%) had an sUA  $< 6.0$  mg/dL, 788 (48.0%) had an sUA of 6.0-8.99 mg/dL, and 470 (29.0%) had an sUA  $\geq 9.0$  mg/dL. The mean gout-related healthcare costs were \$217 (standard deviation [SD] \$631), \$426 (SD \$4330), and \$647 (SD \$4274) for patients with sUA  $< 6.0$  mg/dL, 6.0-8.99 mg/dL, and  $\geq 9.0$  mg/dL, respectively ( $p < 0.0001$ ). Statistically significant differences were also detected in the gout-related outpatient costs, gout-related emergency department costs, and gout-related prescription costs among the three groups. **CONCLUSIONS:** Our results showed that there is a positive association between sUA levels and gout-related healthcare utilization and costs. Lowering and maintaining sUA levels  $< 6$  mg/dL may lead to lower gout-related healthcare costs and decrease gout-related utilization of services. Further study is warranted.

## PMS18

## IMPACT OF TREATMENT PERSISTENCE AND COMPLIANCE ON HEALTH CARE RESOURCE UTILISATION AND TOTAL HEALTH CARE COST IN POST MENOPAUSAL WOMEN PRESCRIBED ORAL BISPHOSPHONATES - A RETROSPECTIVE STUDY USING THE GENERAL PRACTICE RESEARCH DATABASE (GPRD)

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**OBJECTIVES:** Oral bisphosphonate therapy reduces the risk of fractures and associated morbidity in women with post-menopausal osteoporosis. This study evaluated how failure to persist and comply with oral bisphosphonates impacts on the use of health care services and costs. **METHODS:** Retrospective cohort analysis of 6,870 women with incident bisphosphonate prescribing in UK primary care. Persistence was defined as no gaps in refill of  $> 30$  days; compliance was measured using medication possession ratio (MPR  $\geq 80$ ). The impact of non-persistence and non-compliance on the intensity of health service use (HSU) in the 24-month period following treatment was analyzed using negative binomial regression; the impact on costs was analysed using gamma regression. Primary care data, linked Hospital Episode Statistic data and nationally available prescribing and health care cost data were used. **RESULTS:** Persistence and compliance in the 24-month period was 32.4% and 59.2% respectively. In multivariable analysis, non-persistent patients had a 15% increased frequency of primary care contact (incident rate ratio [IRR]: 1.15; 95% CI: 1.12-1.19) and a 92% increased (IRR: 1.92; 95% CI: 1.74-2.12) frequency of inpatient hospitalisation for any cause. The IRR of osteoporosis-related hospitalisations for non-persistent patients was 2.23 (95% CI: 1.66-2.98). Non-compliant patients had a 5% increased frequency of primary care contact (IRR: 1.05; 95% CI: 1.02-1.18), a 55% increased (IRR: 1.55; 95% CI: 1.41-1.69) frequency of all-cause inpatient hospitalisation and a 37% increased frequency of osteoporosis-related hospitalisations (IRR: 1.37; 95% CI: 1.07-1.75). Average total health care cost was significantly higher among non-persistent (£3,557 [95% CI: £3,372-£3,742]) than persistent patients (£2,540 [95% CI: £2,370-£2,710]). Among non-compliant patients, average total health care costs were £3,592 (95% CI: £3,369-£3,816) compared to compliant patients- £3,028 (95% CI: £2,853-£3,202)- a cost difference of £564. **CONCLUSIONS:** Suboptimal persistence and compliance with oral bisphosphonates is associated with significant increases in HSU and costs.

## PMS19

## FRACTURE-RELATED TREATMENT COSTS ATTRIBUTABLE TO PROTON PUMP INHIBITOR USE IN OSTEOPOROSIS PATIENTS

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**OBJECTIVES:** To estimate the differences in fracture-related treatment costs (FTC) between osteoporosis patients with and without proton pump inhibitor (PPI) use.

**METHODS:** Data from the 2001-2008 Medical Expenditure Panel Surveys was used to identify osteoporosis patients  $> 50$  years old through an ICD-9-CM code of 733 or clinical classification code of 206. Patients were categorized into two groups based on PPI use. Considered medications included osteoporosis agents (bisphosphonates, hormone therapy, and raloxifene) and corticosteroids (excluding topicals). Fractures were identified based on ICD-9-CM codes 804-829. Mean of treatment costs were calculated with bootstrap confidence interval due to skewed costs. FTC were estimated using generalized linear model with log link function and gamma distribution. First, FTC for patients treated with PPI were predicted using the estimated coefficients from patients without PPIs using a generalized linear model with adjustments for patient characteristics, medication use, and comorbidities. Second, attributable costs to the use of PPI were estimated by the difference between predicted and observed costs for PPI users. Treatment costs for one year were calculated and converted to 2009 U.S. dollar using appropriate price indices.

**RESULTS:** We identified 4,979 patients with osteoporosis. PPI use was found in 970 patients and in 4,009 it was not. Unadjusted cost differences showed patients with PPI use had similar osteoporosis-related costs (excluding fracture costs) to patients without (\$883 vs. \$798). However, patients treated with PPI had higher FTC by \$335 than patients without PPI use (\$709 vs. \$374). After adjusting for the study variables, PPI use was associated with an increase in FTC by 63% when compared to patients not taking PPIs. **CONCLUSIONS:** Use of PPIs increases the economic burden of osteoporosis patients primarily due to fracture-related costs. Additional studies are warranted to further explore the cost attributable to fracture due to use of PPIs in osteoporosis patients.

## PMS20

## HEALTH CARE RESOURCES UTILIZATION IN THE MANAGEMENT OF JUVENILE IDIOPATHIC ARTHRITIS: ANALYSES WITH THE RAMQ DATABASE

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**OBJECTIVES:** Juvenile idiopathic arthritis (JIA) is a chronic autoimmune inflammatory disease in childhood affecting about 1 in 1000 children. The objectives of this study were to analyze drug utilization in JIA, particularly the use of anti-TNFs and to estimate health care resources utilization associated with JIA management.

**METHODS:** A retrospective prescription claims analysis of a random sample of patients from the Régie de l'assurance maladie du Québec (RAMQ) provincial health plan (Québec, Canada) database was conducted. Data of patients with a diagnosis of rheumatoid arthritis and aged less than 20 years were obtained for the period from January 1998 to December 2009. Healthcare resources consumed by patients with JIA were identified in terms of visits to physicians, physician's interventions, arthritis related medications, other medications, emergency visits and hospitalizations. **RESULTS:** Data were obtained from the RAMQ for a total of 995 patients with a mean age of 11.4 years (SD=5.2). Anti-TNFs were used by 32 patients (3.2%). In the year following initiation of anti-TNF treatment, reductions in all healthcare resources used were observed, the greatest decreases being for the average number of medical visits per patient (before/after: 14.7 vs. 8.1) and average number of physician's interventions per patient (before/after: 5.8 vs. 3.3). Decreases in costs of all healthcare resources were also seen and costs associated with hospitalization decrease significantly by an average of CAN\$1,356 per patient ( $p < 0.05$ ) in the year following the initiation of anti-TNF treatment. **CONCLUSIONS:** Anti-TNFs have demonstrated significant clinical benefits and on other aspects of JIA patients' lives, such as functionality, school performance, or health-related quality of life. Results of these claims analyses showed that the use of anti-TNFs was associated with decreases in healthcare utilization in the year following initiation of treatment which translated in reductions in the cost of healthcare resources for JIA patients.

## PMS21

## ABATACEPT OR INFLIXIMAB FOR RHEUMATOID ARTHRITIS IN VENEZUELA? A COST-EFFECTIVENESS ANALYSIS

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**OBJECTIVES:** To determine the cost-effectiveness of abatacept or infliximab in patients with rheumatoid arthritis (RA) with inadequate response to methotrexate (IR-MTX) in Venezuela. **METHODS:** Adapting a previously validated model, dynamic simulation techniques and clinical data from published literature were used to compare the clinical events, quality of life, and direct medical costs of abatacept and infliximab to MTX. The prevalence of the disease and the demographic characteristics for Venezuela, were used to assign a pretreatment score relative to the Health Assessment Questionnaire (HAQ). Then, HAQ scores were projected over time according to the efficacy of each treatment. The costs associated with each treatment and the disease were calculated from private and public hospitals, for a reference patient weighting 60 kg, and validated with a group of experts. The results of the model were analyzed over a 10-year time horizon using the payer's perspective, and a 3% annual discount. Univariate and probabilistic sensitivity analyses for relevant parameters were performed to assess the robustness of the results of the model. **RESULTS:** A hypothetical cohort of 1,000 patients with RA and IR MTX in Venezuela, followed for 10 years, resulted in mean treatment costs of: US\$5,126, US\$7,824, and US\$27,842 dollars, for MTX, abatacept, and infliximab, respectively. Total direct medical costs (discounted) per patient were US\$ 50,441 (48,819-

52,448) for MTX, US\$ 93,992 (89,366–98,982) for abatacept, and \$73,100 (68,539–81,877) for infliximab. The total QALYs gained(discounted) by MTX, abatacept, and infliximab during the same period were: 2.96 (2.89–3.03), 4.05 (3.85–4.30) and 3.26 (3.16–3.39) respectively. The Incremental Cost-Effectiveness Ratio was US\$ 39,980 (36,649–45,011) for Abatacept compared to MTX compared to US\$ 77,790 (62,369–98,124) per QALY gained with infliximab. **CONCLUSIONS:** The use of abatacept is more cost-effective than the use of infliximab, both compared to MTX, in patients with Rheumatoid Arthritis with IR MTX in Venezuela.

#### PMS22

##### COST-EFFECTIVENESS ANALYSIS OF ETANERCEPT IN THE TREATMENT OF RHEUMATOID ARTHRITIS IN MEXICO

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**OBJECTIVES:** Rheumatoid Arthritis (RA) critically impair the quality of life of patients. Biologic treatments represent a therapeutic alternative for patients who failed disease-modifying antirheumatic drugs. However, their high cost is a challenge for clinicians and decision makers. The aim of this study was to assess the cost-effectiveness of biologic alternatives to treat RA currently available in Mexico, from an institutional perspective. **METHODS:** A decision-tree model was developed to simulate the clinical course of patients treated with etanercept (reference treatment), adalimumab, infliximab, tocilizumab or rituximab as first-line therapies, as well as associated costs over one-year period. Therapy continuation or treatment switch was evaluated at month 6. Effectiveness measures were: proportion of patients achieving 70% improvement in both, tender or swollen joint counts following the American College of Rheumatology (ACR70) criteria and quality adjusted life years gained (QALY's). Costs considered included: biologics, concomitant drugs, medical follow-up and side effects management. Clinical response of alternatives was extracted from published literature, while costs were collected from Instituto Mexicano del Seguro Social (IMSS) official databases. Probabilistic sensitivity analyses were done through Monte Carlo Simulation second-order approach. **RESULTS:** The effectiveness of therapies resulted in [ACR70, QALY's]: etanercept [31.3%, 0.79]; adalimumab [18.1%, 0.77]; infliximab [12.8%, 0.73]; tocilizumab [21.1%, 0.77] and rituximab [11.9%, 0.75]. Expected mean costs per patient were: US\$12,914.36 [95%CI US\$12,901.58-US\$12,927.08]; US\$15,715.06 [95%CI US\$15,699.73-US\$15,730.39]; US\$14,479.96 [95%CI 14,465.77-US\$14,494.16]; US\$44,455.03 [95%CI US\$44,411.53-US\$44,498.53] and US\$17,267.61 [95%CI US\$17,250-US\$17,284.53], respectively. Etanercept is both, the less costly and the most effective alternative: US\$31,504.80 less than tocilizumab (the most costly alternative) and 19.3% more patients meet the ACR70 criteria regarding rituximab (the less effective alternative). Acceptability curves showed that etanercept regardless willingness to pay would be the most cost-effective biologic. **CONCLUSIONS:** Due to their lower costs and favorable effectiveness profile, etanercept is dominant over other biologic treatments in the management of RA at IMSS.

#### PMS23

##### COST-EFFECTIVENESS ANALYSIS OF ANALGESIC THERAPY FOR POSTOPERATIVE PAIN AFTER TOTAL HIP ARTHROPLASTY IN MEXICO

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**OBJECTIVES:** Inappropriate analgesia in postoperative pain (POP) raises hospitalization costs and increases the burden of several surgeries with a meaningful impact over patient's quality of life. The objective of this study was to develop an economic analysis to evaluate parecoxib, ketorolac and morphine in the treatment of POP in patients who underwent total hip arthroplasty from an institutional perspective. **METHODS:** A cost-effectiveness analysis was developed using a Bayesian decision-tree model, to simulate costs and effectiveness outcomes over the postoperative hospitalization period (15 days). Comparators were multimodal analgesics: morphine (52 mg/day) plus parecoxib (40 mg/day); morphine (52 mg/day) plus ketorolac (90 mg/day) and morphine (57 mg/day) alone. Effectiveness measures were: percentage of treatment response without adverse events (AE) meeting the highest score of the patient's global evaluation survey (excellent). Effectiveness data and transition probabilities were collected from international published literature. Resource use and cost data was gathered from hospital records of patients undergoing total hip arthroplasty at the Social Security Mexican Institute (IMSS) (n=89). The model was calibrated according to international pharmacoeconomics guidelines. One-way and probabilistic sensitivity analyses were performed with Monte Carlo Simulation second-order approach. **RESULTS:** Patients who received parecoxib exhibited 41% of treatment response, followed by morphine (26%) and ketorolac (24%). Estimated costs per patient were lower with parecoxib (US\$ 5,439.30) followed by ketorolac (US\$5,538.91) and morphine (US\$5,553.71). No statistical differences were found among the costs of analgesic therapies (p>0.05). Parecoxib showed a weak dominance against its competitors. Acceptability curves showed parecoxib as the most cost-effective therapy with 95% when willingness to pay is US\$6,500. **CONCLUSIONS:** Results show that at the IMSS, parecoxib is a cost-effective treatment that significantly reduces POP in patients who underwent total hip arthroplasty. This information could be useful for developing markets healthcare institutions in order to establish efficient analgesics improving current health outcomes.

#### PMS24

##### THE COST EFFECTIVENESS OF STRONTIUM RANELATE VERSUS RISEDRONATE, RALOXIFENE, IBANDRONATE, ALENDRONATE AND CALCITONIN IN THE TREATMENT OF POSTMENOPAUSAL OSTEOPOROTIC WOMEN IN TURKEY

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**OBJECTIVES:** The goal of this study was to estimate the cost-effectiveness of strontium ranelate in the treatment of postmenopausal osteoporotic women in Turkey. **METHODS:** A validated Markov microsimulation model with a Turkish payer's perspective estimated the cost per quality-adjusted life-year (QALY) of strontium ranelate treatment compared with risedronate, raloxifene, ibandronate, alendronate and calcitonin. Markov Model was used and applied in the Treeage Pro software over a cohort of 1000 patients in the pharmacoeconomic analysis. As for the sensitivity analysis, the Monte Carlo Simulation was used, applying a simulation of 10,000. Data on the effect of both treatments on fracture risk were taken from the literature. The cost of the treatments were calculated based on Turkish reimbursement systems, the indirect and intangible costs were omitted. The direct disease costs include the amount spent for the costs associated with the outpatient, inpatient, medical supplies, all the laboratory or imaging tests and the interventions performed. The costs of the side effects were added to all the drug costs. The official product summaries were used for detecting the side effects of the products. **RESULTS:** Strontium Ranelate provides the highest gain of quality life years and is the superlative therapeutical choice with respect to QALY. According to its cost and effectiveness value, strontium ranelate was dominant (i.e. more effective and less costly) versus ibandronate and calcitonine for postmenopausal osteoporotic women. The cost per QALY gained by strontium ranelate compared to ibandronate was € 5582 and calcitonine was € 3943. Compared to alendronate, risedronate and raloxifene, strontium ranelate was cost effective (i.e. more costly but more effective). **CONCLUSIONS:** The results of this study suggest that strontium ranelate is a cost-effective strategy, in a Turkish setting, for the treatment of postmenopausal osteoporotic women.

#### PMS25

##### COST-EFFECTIVENESS OF ABATACEPT OR INFILIXIMAB IN RHEUMATOID ARTHRITIS IN COLOMBIA

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**OBJECTIVES:** Determine the cost-effectiveness of abatacept or infliximab in patients with rheumatoid arthritis (RA) with inadequate response to methotrexate (IR-MTX) in Colombia. **METHODS:** Dynamic simulation techniques from a previously validated model and clinical data from published literature were used for the analysis. The functional disability was assessed using the Health Assessment Questionnaire (HAQ). A HAQ score was randomly assigned pre-treatment based on the prevalence of the disease and the demographic characteristics for Colombia, then projected over time using the efficacy results from published trials. Direct medical costs were calculated from private and public hospitals, and the information system of the Ministry of Social Protection (SISMED) and validated with local experts (Exchange rate: \$1,920 Colombian peso=1 US Dollar). A 10-year time horizon and the payer's perspective were assumed. Costs and health outcomes were discounted at 3% annually. Univariate and probabilistic sensitivity analyses were performed to assess the robustness of the results of the model. **RESULTS:** In a hypothetical cohort of 1,000 patients with RA – IR MTX, the costs of treatment for the first year for MTX were US\$794 dollars, compared to US\$16,659 for abatacept and US\$17,531 for infliximab, assuming dosages for average patients below 60 kg. Additional analysis with patients over 60 kg were included in the sensitivity analysis. After 10 years of follow-up the discounted total direct medical costs per patient were US\$55,998 (54,354–57,776) for MTX, US\$99,888 (94,694–104,437) for abatacept, and \$79,174 (75,795–83,899) for infliximab. The total number of QALYs gained (discounted) by MTX, abatacept, and infliximab were: 2.88 (2.79–2.95), 3.94 (3.79–4.09) and 3.17 (3.09–3.27) respectively. The calculated ICERs for abatacept and infliximab compared to MTX were US\$ 37,513 (35,221–39,909) and US\$75,873 (62,825–103,132) per QALY gained, respectively. **CONCLUSIONS:** In patients with RA – IR MTX in Colombia, the use of abatacept is more cost-effective than the use of infliximab, both compared to MTX.

#### PMS26

##### COST-EFFECTIVENESS MODELING IN OSTEOPOROSIS: A SYSTEMATIC LITERATURE REVIEW AND OVERVIEW

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**OBJECTIVES:** To conduct a structured review of the recent osteoporosis cost-effectiveness modeling literature and provide an overview of their methodologies and approaches. **METHODS:** A detailed systematic review was performed of the following literature databases: MEDLINE, MEDLINE In-Process, EMBASE, Cochrane, HEED, NHSEED, EconLit, and googlescholar. Using pre-selected inclusion/exclusion criteria relevant studies published since January 2005 were identified. Relevant information from each identified study was extracted according to a predefined grid and essential features of each osteoporosis cost-effectiveness model were recorded. **RESULTS:** Forty-eight relevant and recently published osteoporosis cost-effectiveness models were identified. Model structures were cohort Markov (56%) and individualized microsimulations (44%). Most models (35) used a lifetime timeframe (i.e., death or ≥ age 100). The primary interventions investigated were bisphosphonates (79%), raloxifene (15%), and hormone replacement therapy (10%). In 98% of