METHODS: Patients received twice-daily doses of tapentadol ER (100–250 mg), oxycodone HCl controlled release (CR; 20–50 mg), or placebo over a 15-week treatment period. Patients completed the EQ-5D (evaluates mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) at baseline and at prespecified time points. **RESULTS:** Efficacy and safety were evaluated for 1,023 patients who received ≥1 dose of study medication. Overall, the change from baseline in the EQ-5D health status index was significantly greater with tapentadol ER versus both oxycodone CR and placebo (least squares mean difference [95% confidence interval] between tapentadol ER and oxycodone CR, 0.07 [0.03,0.10; $P < 0.001$]; between tapentadol ER and placebo, 0.05 [0.02,0.09; $P = 0.004$]). Differences between oxycodone CR and placebo were not significant (–0.01 [–0.05,0.02; $P = 0.449$]). Across all treatment groups at baseline, the percentages of patients reporting no problems in each of the EQ-5D dimensions were as follows: mobility, 9%–10%; self-care, 77%–82%; usual activities, 14%–17%; pain/discomfort, 0%–1%; and anxiety/depression, 68%–70%. At endpoint, the percentages of patients reporting no problems were mobility: placebo, 16.3%; tapentadol ER, 25.0%; oxycodone CR, 16.7%; self-care: placebo, 75.1%; tapentadol ER, 81.1%; oxycodone CR, 80.1%; usual activities: placebo, 26.1%; tapentadol ER, 33.7%; oxycodone CR, 27.2%; pain/discomfort: placebo, 5.6%; tapentadol ER, 9.0%; oxycodone CR 4.7%; and anxiety/depression: placebo, 71.8%; tapentadol ER, 70.9%; oxycodone CR, 69.6%. A total of 61.1%, 75.9%, and 87.4% of patients who received placebo, tapentadol ER, and oxycodone CR, respectively, reported ≥1 treatment-emergent adverse event. **CONCLUSIONS:** Treatment with tapentadol ER (100–250 mg bid) significantly improved overall health status compared with placebo and oxycodone HCl CR (20–50 mg bid) in patients with moderate to severe chronic osteoarthritis knee pain.

PMS5

A SYSTEMATIC REVIEW AND MIXED TREATMENT COMPARISON (MTC) OF THE EFFICACY OF PHARMACOLOGICAL TREATMENTS FOR FIBROMYALGIA

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OBJECTIVES: The aim of the current study was to compare the efficacy of pharmacological treatments for the management of fibromyalgia with particular focus on outcomes considered most important by the Outcome Measures in Rheumatoid Arthritis Clinical Trials (OMERACT) symposium. **METHODS:** A systematic review was conducted to identify randomised controlled trials (RCTs) evaluating pharmacological treatments in adults with fibromyalgia. A Bayesian MTC was performed in WinBUGS to estimate the relative efficacy of the evaluated treatments. The primary efficacy outcome was the absolute reduction in pain score at study endpoint, based on visual analogue or numerical rating scales. Secondary efficacy outcomes included proportion of patients responding, changes in Fibromyalgia Impact Questionnaire (FIQ) total score, sleep and quality of life measures. Random-effects models were used to account for any heterogeneity; fixed-effects models were evaluated in sensitivity analysis. **RESULTS:** Eleven RCTs were included in the review, with 21 RCTs meeting criteria for inclusion in the meta-analysis (fixed-dosing regimen, parallel-group study design, and high quality [Jadad score ≥3]). Ten RCTs reported data on the primary outcome measure suitable for inclusion in the MTC. These trials evaluated nine treatment regimens: alprazolam, citalopram, duloxetine, ibuprofen, milnacipran, paroxetine, placebo, pregabalin, ibuprofen + alprazolam. Results from a random-effects MTC found that only pregabalin 300, 450, 600 mg/day and duloxetine 20, 60, 120 mg/day produced significantly greater reductions in pain score ($p < 0.05$) than placebo. Duloxetine 120 mg/day was significantly superior to citalopram 20 mg/day and milnacipran 100 mg/day ($p < 0.05$), with no other statistically significant differences reported between active treatments. **CONCLUSIONS:** Only 21 studies met the inclusion criteria for the MTC reflecting the relatively poor quality of the majority of published studies. Of the treatments included in the MTC of the primary outcome, only pregabalin and duloxetine were significantly superior to placebo for pain relief.

PMS6

HEALTH ASSESSMENT QUESTIONNAIRE-DISABILITY INDEX (HAQ-DI) SCORES IN PATIENTS WITH RHEUMATOID ARTHRITIS (RA) TREATED WITH TOCILIZUMAB PLUS CONVENTIONAL ANTI-RHEUMATIC DRUGS

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OBJECTIVES: Cost-effectiveness models of biologic treatments for RA have been shown to be strongly affected by improved physical function, as measured by HAQ-DI. This analysis was conducted to focus on patients receiving continuous treatment with tocilizumab (TCZ) 8 mg/kg monthly and conventional anti-rheumatic medications for more than 24 weeks, while assessing HAQ-DI scores. **METHODS:** HAQ-DI scores in patients with moderate to severe RA were obtained from the 8-mg/kg treatment groups of three extension studies of four randomised, placebo-controlled studies. Analysis focused on observations at or after week 24 to assess the long-term effects of treatment. Week 192 was chosen as a cut-off to preserve sufficient sample size. Analysis of mean HAQ-DI scores (average at each time window) was conducted for all observations. Parallel analysis was conducted separately for patients who received previous therapy with anti-TNF agents that did or did not fail. A trendline was fitted to the data to describe the overall trend and assess its linearity. In addition, a mixed linear model of HAQ-DI as a function of time was estimated at the patient level. **RESULTS:** A total of 1422 patients were available at week 24. Nearly 40% (546) have been observed through week 156, and 56 have been observed through week 192. All-observed analysis showed a strong linear relationship with a slow, steady decrease in HAQ-DI scores through week 192 (week 24 = 1.05; week 192 = 0.88; slope = –0.015; $R^2 = 0.87$). HAQ-DI improvement was monotonic through week 156. Stratification by previous failure of anti-TNF therapy produced similar findings. Patient-level mixed-model results were consistent, showing a significant downward slope. **CONCLUSIONS:** Patients with RA treated with 8 mg TCZ in combination with standard anti-rheumatic medications have steadily improving HAQ-DI scores while on treatment through week 192. Cost-effectiveness models of TCZ should include these findings to accurately gauge the utility of treatment.

PMS7

DOSING PATTERN COMPARISON BETWEEN DULOXETINE AND PREGABALIN AMONG PATIENTS WITH FIBROMYALGIA

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OBJECTIVES: To compare dosing patterns between duloxetine and pregabalin among patients with fibromyalgia. **METHODS:** Using a large US administrative claims database, we examined commercially insured individuals aged 18–64 with fibromyalgia who initiated duloxetine or pregabalin in 2006. Initiation was defined as 90-day medication gap, with the dispense date of the first initiation as the index date. All patients included had 12-month continuous enrollment in the pre- and post-index period, and at least 30 days supply of duloxetine or pregabalin in the 12 months post-index period. Patients with diabetic peripheral neuropathic pain or depression in the 12 months pre-index period were excluded. Duloxetine or pregabalin cohorts were constructed based on the index agent. Average daily doses of all duloxetine or pregabalin prescriptions per person, average daily dose in each of the first 12 prescriptions, and percent of daily dose change from previous prescription were compared between duloxetine and pregabalin cohorts. **RESULTS:** Both the duloxetine (n = 3773) and pregabalin (n = 4189) cohorts had the mean age of 50 years. The duloxetine cohort had an average initial daily dose of 55.7 mg, while 161.5 mg for the pregabalin cohort. The average daily dose per patient was 55.5 mg for duloxetine and 195.7 mg for pregabalin. The average daily doses for the first through twelfth duloxetine scripts varied from 55.68 mg (95% Confidence Interval (CI): 54.96, 56.40) to 60.34 mg (95% CI: 54.71, 65.97), while the numbers were 161.50 mg (95% CI: 159.02, 163.98) and 282.41 mg (95% CI: 266.89, 297.93) for pregabalin. The percentages of changes in daily dose from previous prescriptions were –4.2~1.6% for duloxetine and 1.3~14.3% for pregabalin, respectively. **CONCLUSIONS:** Among patients with fibromyalgia, duloxetine and pregabalin initiators had very different dosing patterns. The average daily dose for duloxetine was relatively stable over time, while pregabalin patients had significant dose escalation over the 12-month follow-up period.

PMS8

PREVALENCE OF FIBROMYALGIA IN RUSSIA

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OBJECTIVES: To assess the estimated prevalence of fibromyalgia sufferers in Russia among the general adult population. **METHODS: To The validated Russian version** of the screening questionnaire was administrated to a representative community sample (n = 1610), defined by IPSOS® according to the quotas method (sex, age, householder's profession) with a stratification according to the region / cities community. The LFESSQ questionnaire allows to screen patients who might have fibromyalgia. **The LFESSQ questionnaire allows to screen patients who might have fibromyalgia.** A positive screen was defined as: meeting the 4-pain criteria alone (LFESSQ-4), or meeting both the 4-pain and 2-fatigue criteria (LFESSQ-6). The questionnaire was submitted to a sample of rheumatology outpatients (n = 399), who were then examined by a trained rheumatologist to confirm or exclude the diagnosis of FM according to the 1990 American College of Rheumatology criteria. The prevalence of FM in the general population was estimated by applying the predictive positive value to eligible community subjects (i.e., positive screens). **RESULTS: The community sample is con**stituted of 885 females and 725 men. 20.1% screened positive for LFESSQ-4 (25.3% in females and 13.7% in males respectively). A total of 13.8% screened positive for LFESSQ-6 (18.4% in females and 8.1% in males, respectively). Among rheumatology outpatients, 43.6% were screened positive for LFESSQ-6 (44.3% in females and 40.5% in males, respectively), whereas 6.5% were confirmed FM cases (ACR criteria). The prevalence of FM was estimated at 2.1% (95% CI: 1.4%–2.8%, 2.8% in females and 1.2% in males respectively) in the Russian general population. **CONCLUSIONS:** Our findings are in agreement with those of earlier national survey reports and previous publications in US, Canada and Spain. A point prevalence of 2.1 % would translate in approximately 2.5 million of patients with FM in Russia.

PMS9

SECULAR DECREASES IN OSTEOPOROTIC FRACTURE RATES 1986–2006: A POPULATION-BASED ANALYSIS

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OBJECTIVES: Secular decreases in hip fracture rates have been reported in some countries. Whether this phenomenon applies to other fracture sites has not been studied. Our objective was to examine fracture patterns across twenty years in a

population-based cohort to inform health care planners on trends in costs and resource needs related to fractures. **METHODS:** We used the Population Health Research Data Repository for the Province of Manitoba, Canada which is a comprehensive collection of databases including physician visits, hospitalizations and pharmaceutical prescriptions. Age and sex-adjusted fracture rates were calculated for men and women age fifty years and older from 1986 to 2006 according to fracture site (defined by ICD-9-CM codes) and mechanism (presence/absence of ICD-9-CM external injury codes). Generalized linear models with generalized estimating equations were used to derive adjusted annual rates and test the linear change overall, and for men and women separately. **RESULTS:** Osteoporotic fractures (non-traumatic fractures of the hip, forearm, spine and humerus) showed a significant linear decline (0.8% per-annum [95% CI 0.3–1.2%]), with a greater decline in women (1.0% [0.4–1.7%]) than in men (0.5% [0.0–1.3%], $P < .05$ for sex interaction). Similar trends were seen for all fractures sites: hip 0.9% (0.2–1.7%), forearm 0.8% (0.4–1.3%), humerus (0.7% [0.2–1.2%]) and spine (0.5% [0.0–1.0%]) A greater reduction in traumatic fractures was observed (1.8% per-annum [95% CI 1.0–2.6%]), with a greater decline in men (2.2% [1.3–3.1%]) than in women (1.3% [0.2–2.4%], $P < .05$ for sex interaction). Similar results were seen when testing the difference between the initial 5 years (1986–1991) and the final five years (2001–2006) of data. **CONCLUSIONS:** We observed a decrease in both non-traumatic (osteoporotic) and traumatic fracture rates over the study period. This decline was apparent in years prior to widespread osteoporosis testing or availability of modern pharmacotherapy.

PMS10

RECURRENT FRACTURES AFTER FIRST HIP FRACTURES POSHIP(PREVENTION OF SECOND HIP FRACTURES) STUDY

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OBJECTIVES: It has been reported that bone fracture the risk of developing increases for patients who had fractures once before, and and that such patients do not receive enough osteoporosis treatment. In this present study, we investigated incidence of recurrent fractures and the circumstances of pharmacotherapy for osteoporosis among patients who had experience first hip fracture. **METHODS:** Female patients 65 years and older who had experienced first hip fractures from January 1, 2006 to December 31, 2007 were enrolled at 25 hospitals.We reviewed their medical records and conducted a patient survey to collect information on surgical methods, osteoporosis treatments and prognosis for 1 year after first hip fracture.The questionnaires were filled out by either the patient or family member. This interim analysis was conducted for 477 patients of 7 hospitals out of 2,266 enrolled patients. **RESULTS:** The average age was 84.0 (66–103) years old. In terms of fracture type, we identified 237 cervical cases and 237 intertrochantric fractures, with 3 cases that were not specified. A total of 94.3 % of the patients received an operation. During hospitalization, 26.2% were on pharmacotherapy and 22.9% received no pharmacotherapy. For the observational period, 1 year after first fractures, 13.4% of the patients received pharmacotherapy, but 57.2% received no treatment. For the observational period, 44 patients (9.2%) experienced recurrent fractures and 18 (3.8%) out of those suffered hip fractures. **CONCLUSIONS:** In this study, the incidence of recurrent hip fractures among patients who have already experienced a first hip fracture was 3,800/100,000 person-year. This is 7.4 times the rate found in the general population of the same age group. Despite this increase in incidence rate, only 13% of patients had received osteoporosis treatment after the first hip fracture. Japanese patients who have already suffered from a first hip fracture must be considered high risk patients who should be treated with preventive action.

PMS11

LONG-TERM MORTALITY RATES AFTER INCIDENT FRACTURES IN A POPULATION-BASED COHORT OF MEN AND WOMEN

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OBJECTIVES: Osteoporosis is characterized by low bone mass and increased fracture risk. Increased mortality rates have been documented following fractures, particularly hip and vertebral. Our aim was to compare short-term and long-term mortality rates following an incident fracture in men and women at different sites (hip, wrist, spine, humerus and others). **METHODS:** We identified a population-based cohort of men and women with non-traumatic incident fractures between 1986 and 2006 within the hospital, physician and pharmacy administrative database repository of the Province of Manitoba, Canada. The cohort-entry date was the date of a first fracture (index fracture) after age 50 years. Two matched controls from the same databases were identified for each case. Crude and adjusted mortality rates for each fracture site were computed separately for men and women. Secular trends in fracture site-specific mortality rates over the study period were tested using generalized linear models. **RESULTS:** We identified 23,514 index fractures in men and 52,897 in women. The crude mortality rates were consistently higher in men compared to women. Highest first year mortality rates were noted after hip (women 20.1% vs. men 33.6%) followed by spine fractures (13.9% vs. 15.8%), with lower mortality rates after humerus (7.4% vs. 15.3%), wrist (3.4% vs. 5.3%) and other fractures (9.2% vs. 11.0%). Similar rankings by fracture site were seen for year five mortality: hip fractures (women 53.1% vs. men 66.7%) followed by spine (38.4% vs. 43.1%), humerus (26.6% vs. 41.2%), wrist (15.7% vs. 21.2%) and other fractures (26.5% vs. 29.3%). Post-fracture mortality rates were generally stable over the study period. **CONCLUSIONS:** Fractures at all sites are associated with significant mortality rates, particularly in men. Better understanding of factors associated with increased post-fracture mortality will inform the development of practice guidelines and improved clinical outcomes.

MUSCULAR-SKELETAL DISORDERS – Cost Studies

PMS12

PROBABILISTIC ANALYSIS OF BUDGETARY IMPACT: GLUCOSAMINE IN KNEE OSTEOARTHRITIS TREATMENT

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OBJECTIVES: To determine the financial impact of inclusion of glucosamine in the hospital formulary of Petchabun Hospital. **METHODS:** Conventional NSAIDs, celecoxib, glucosamine were included in the analysis. Hospital perspective was used and we considered only patients who failed to control pain by acetaminophen. Treatment cost of GI and CV event was calculated based on decision tree model in which cooperated with probability from the literature and local DRG cost data. Average cost of drug use per patient per year was calculated from the medical history and computerized dispensing data. Delphi technique with all treating orthopaedics was used to obtain the estimates of number of patient eligible for glucosamine use and effect on volume of other drugs' use in the following years. Probabilistic analysis was used to capture the certainties around estimations. We analyzed this data in a 5-year timeframe (2005–2009) as we assumed the steady penetration of glucosamine was reached. **RESULTS:** In 2005, we estimated there was an increase in drug budget for knee osteoarthritis treatment around 0.8 million baht (23,000 US$) which was growing from 2004 at 7%; it was similar to the growth rate in the ealier year. This was mainly due to the expected reduction in NSAIDs and coxib uses. The forecast budget impact in 2006–2009 were about 0.8, 0.6, 0.5, and 0.2 million baht at the growth rate 6.2%, 4.4%, 3.5% , and 1.5%respectively. Cost of glucosamine was found to be the most sensitive variable, followed by cost of celecoxib and number of patients using glucosamine. **CONCLUSIONS:** Hospital administrators found that glucosamine use resulted in an affordable financial burden to the drug budget for knee osteoarthritis in the hospital. However, to ensure the effective use of glucosamine, they developed the guideline for glucosamine use and also monitor the clinical and economic outcomes. Updated analyses were also recommended to obtain the reliable information for budget planning in the following years.

PMS13

BUDGETARY IMPACT OF A NEW URATE-LOWERING THERAPY (ULT) FOR THE TREATMENT OF GOUT IN A US HEALTH PLAN FORMULARY

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OBJECTIVES: Gout is a chronic condition caused by hyperuricemia, a metabolism and excretion disorder characterized by intense pain "flares" in affected joints. The objective was to estimate budgetary impact of adding febuxostat to a US health plan formulary for gout treatment. **METHODS:** An interactive model was developed using decision analysis methods comparing expected annual number of gout flares and associated costs among members treated with febuxostat 40 mg/80 mg vs allopurinol 300 mg for 1 year. Underlying model data and default inputs were obtained from clinical trials, retrospective studies, and published literature. Gout prevalence was 1%, among which 34% were estimated to be treated. Average febuxostat 1-year market share was assumed to be 3.9%. Model outputs included total per-member per-month (PMPM) cost; gout-, tophi-, and flare-related medical costs and total pharmacy costs, and number needed to treat (NNT). Costs were adjusted to 2008 $US. User-modified sensitivity analysis on gout prevalence, ULT market share, and pharmacy cost was conducted. **RESULTS:** In a hypothetical 1-million-member health plan, adding febuxostat 40 mg/80 mg to the formulary is expected to increase total annual cost by $0.008 PMPM, reduce gout-related costs by $26,010, and increase pharmacy costs by $124,494. Model data projected a reduction of 22 flares when adding febuxostat to the formulary and NNT of 6.25 patients on febuxostat to prevent 1 gout flare. Sensitivity analyses indicate a positive relationship between febuxostat market share and gout flares avoided and gout-related medical costs. **CONCLUSIONS:** This robust model evaluates the 1-year pharmacy and medical cost offsets on total payer budget. Adding a new ULT to a US health plan formulary minimally impacts total payer budget as shown by the marginal PMPM cost increase and significant gout-related medical savings.

PMS14

MODELING THE PROGRESSION OF RHEUMATOID ARTHRITIS IN ITALY: BUDGET IMPACT ANALYSIS FOR BIOLOGIC AGENTS

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OBJECTIVES: Two simulation models were developed to analyze the cost and outcomes of the biological agents currently marketed in Italy vs disease-modifying anti-rheumatic drugs (DMARDs) that affect the progression of rheumatoid arthritis (RA). METHODS: A Markov model over 10 years was constructed with four disease states according to functional status (HAQ). Disease progression (transition probabilities between the states) was taken from clinical trial data and published literature. Patient