event rates. Differences between NSAIDs were modeled from observed rates of GI events and adverse effects after adjusting for differences in population characteristics across three clinical trials (TARGET, CLASS and VIGOR). Other enhancements included modeling: 1) serious hepatic, renal, and skin adverse events (AEs); 2) proton pump inhibitor use after dyspepsia, while taking an NSAID; and 3) multiple occurrences of myocardial infarction (MI) (as opposed to one per patient). Health state utilities for AEs were assigned a value equal to that for the hospitalized surgical management of a complicated GI event. For MI, a 5% discount factor was used to reduce the patient's utility score. Patients switching to acetaminophen because of an AE can experience reduced analgesic effect compared with NSAIDs; therefore utilities were discounted by 20%. **RESULTS:** The modified model produced lower estimates of LYs and QALYs (approximately 0.05 and 0.08 less, respectively) compared with the original model which could be clinically meaningful in a 5-year model. Patient and clinical characteristics that defined low GI-risk subgroup versus high GI-risk group produced differences in LYs and QALYs of up to 1 LY and 0.7 QALY. **CONCLUSION:** Effectiveness can vary considerably across patients with varying clinical characteristics. Therefore, the cost-effectiveness of treatment in any population should consider the heterogeneity of patients. This model provides flexible means to compare cost-effectiveness of treatment for patients with osteoarthritis.

PAR7

MODELLING OF THE COST-EFFECTIVENESS OF RITUXIMAB FOR TREATMENT OF RHEUMATOID ARTHRITIS IN ITALY

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OBJECTIVES: Rituximab (RTX), a unique selective B-cell therapy, is a new option for rheumatoid arthritis (RA) patients who respond inadequately to anti-TNF therapies. This study reports a cost-effectiveness analysis modelling the introduction of RTX in Italy. **METHODS:** We used ACR response rates (adjusted for differences in study populations), plus observational data from EU registries and simulated real-life treatment for 10,000 RA patients who had responded inadequately to anti-TNF therapy, using baseline patient characteristics from the REFLEX study. We assumed an average treatment duration for biological therapy (in combination with methotrexate) of up to 4.25 years over the patient's remaining lifetime. QALYs were mapped from a disease-severity measure (HAQ score) and based on registry data. Relevant costs included (2004–5 Euros [€]) drug costs (including administration and monitoring) and those related to reduced productivity (indirect costs). We assessed RTX as either a new treatment step or instead of adalimumab. **RESULTS:** Average annual treatment costs were €8796 for RTX + MTX, €14,133 for adalimumab, €14,406 for etanercept, and €9950 for infliximab. Compared with the current treatment sequence, RTX + MTX as a new treatment step produced a gain of 0.677 QALYs at an incremental total medical cost of €12,355 over the lifetime of each patient—an incremental cost-effectiveness ratio (ICER) of €18,259 per QALY gained. The incremental cost per QALY for drug therapy or total (direct + indirect) cost was €19,241 and €13,621. RTX used instead of adalimumab produced a similar QALY gain, but resulted in a total direct medical-cost saving of €11,389 over the patient's lifetime. **CONCLUSIONS:** RTX offers a highly acceptable incremental cost per QALY gained for Italian patients with RA who respond inadequately to anti-TNF therapy and the possibility of either treating more patients within an existing budget or reducing the overall treatment cost for RA patients.

PAR8

USING MABTHERA IN PATIENTS WITH RHEUMATIC ARTHRITIS IN SPAIN: RESULTS OF COST-EFFECTIVENESS DATA BASED ON MICRO-SIMULATION

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Rituximab (RTX), is a new and unique selective B-cell therapy for rheumatoid arthritis (RA) patients who respond inadequately to anti-TNF therapies. **OBJECTIVES:** We determined the cost-effectiveness of introducing RTX in Spain. **METHODS:** Our cost-effectiveness model simulates a real-life Spanish treatment sequence for 10,000 RA patients who had responded inadequately to one anti-TNF therapy. We used ACR response rates for RTX and current treatment options, available epidemiological data from observational studies and baseline characteristics from the REFLEX study. The model estimated the incremental cost per QALY gained, with RTX as either a new or alternative treatment over each patient's remaining lifetime, assuming time-on-treatment for biological agents (in combination with methotrexate) of up to 4.25 years. QALYs came from a disease severity measure (HAQ score). Costs included (2004–5 EURO) drug costs (including administration and monitoring) and costs related to disease progression, palliative care, and reduced productivity (indirect costs). Costs and benefits were discounted at 3.5% per annum. **RESULTS:** Annual average treatment costs were €7431 for RTX + MTX, €14,072 for adalimumab, €13,067 for etanercept, and €9823 for infliximab. Added to existing therapies, RTX would lead to a gain of 0.632 QALYs at an additional total direct medical cost of €11,550 over each patient's lifetime. The corresponding incremental cost-effectiveness ratio (ICER) of RTX was €18,261 per QALY gained. Corresponding ICERs for drug therapy and total costs were €19,597 and €15,546 per QALY gained, respectively. Used in place of etanercept as second-line biologic DMARD, RTX + MTX were associated with lifetime drug cost-savings of over €17,000. **CONCLUSIONS:** Adding RTX to the pool of available treatment options for Spanish patients with RA who respond inadequately to anti-TNF therapy results in a favourable incremental cost per QALY gained. When RTX is replacing another biologic DMARD, the average annual drug therapy costs can be lowered.

PAR9

A PHARMACOECONOMIC EVALUATION FOR THE TREATMENT OF ARTICULAR PAIN IN PATIENTS WITH OSTEOARTHRITIS IN MEXICO

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OBJECTIVES: Nonsteroidal antiinflammatory drugs (NSAIDs) are in widespread use for rheumatic diseases in Mexico, but can cause peptic ulcers and gastrointestinal bleeding and perforation. The purpose of this study was to evaluate cost—effectiveness ratios of celecoxib compared with NSAIDs and acetaminophen in adult patients with osteoarthritis in four hospitals in the Social Security Mexican Institute. **METHODS:** A decision tree model was developed using a Bayesian approach. The model simulated treatment of a hypothetical cohort of 1000 patients diagnosed with osteoarthritis during a time horizon of 6 months. Patients could initiate treatment with celecoxib, NSAIDs (diclofenac, naproxen) and acetaminophen. Conditional probabilities of the

model were obtained from published clinical trials and were complemented with Mexican expert opinion surveys. Effectiveness measure was the number of patients with articular pain controlled without adverse events (peptic ulcers, gastrointestinal bleeding, and others). The analysis was conducted from the healthcare payer's perspective. Resource use and costs were obtained from hospital records and Mexican official databases. Threshold and probabilistic sensitivity analysis was performed and acceptability curves were constructed. **RESULTS:** The model indicates that the use of celecoxib could lead to the avoidance of a significant number of adverse events associated to NSAIDs and acetaminophen. Celecoxib showed on the six-months period similar ($p = 0.52$) expected costs per patient (US$609.8) than the treatment with NSAIDs (US$615.6) and lower costs ($p < 0.01$) compared with acetaminophen (US$656.7). On the other hand, celecoxib was associated with higher effectiveness (371 patients, CI 95% 255–452) followed by NSAIDs and acetaminophen (274 and 270 patients, respectively). Results were robust to Monte Carlo first order sensitivity analysis. Acceptability curves showed the same results with a mean of 44.5% of certainty. **CONCLUSIONS:** Despite its higher cost in the Mexican market, celecoxib was cost—effective for the management of articular pain in patients with ostheoarthritis.

PAR10

COST-EFFECTIVENESS OF RITUXIMAB THERAPY FOR RHEUMATOID ARTHRITIS: A PAN-EUROPEAN ANALYSIS

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OBJECTIVES: Clinical studies such as REFLEX established the efficacy of rituximab (RTX) in patients with rheumatoid arthritis (RA) who have had an inadequate response to anti-TNF therapy. This analysis evaluated the cost-effectiveness of treating such patients with RTX across different EU countries. **METHODS:** Our cost-effectiveness model assessed RA treatments in a real-life setting based on practices in Germany, Italy, Spain, France, and the UK. The model is based on ACR response rates for RTX and current treatment options (adjusted for the different study populations), complemented with epidemiological data from observational studies. It simulates a cohort of 10,000 patients who have failed to respond to anti-TNF therapy. Baseline patient characteristics were from the REFLEX study. For each country, the cost-effectiveness of providing RTX either as an additional treatment or an alternative to a second-line biologic DMARD was examined using a treatment duration for biological therapy (in combination with methotrexate) of up to 4.25 years. QALYs were mapped from a disease severity measure (HAQ score) and resource utilization data were UK or German registry data. The model included costs related to drug therapy (including administration and monitoring), palliative care and reduced productivity (indirect costs) (2004–5 Euros [€]). Costs and benefits were discounted at 3.5% per annum. **RESULTS:** Using RTX resulted in lower average annual cost compared to any of the anti-TNF treatments. The cost per QALY (direct medical cost) was in the range of €18,000 to €23,000 across all health care systems. When RTX is replacing a treatment option in the current treatment sequence, average annual treatment costs can be reduced. **CONCLUSIONS:** This pan-European analysis shows that adding RTX to the therapeutic armamentarium for patients with RA who respond inadequately to anti-TNF therapy is highly cost-effective, with an incremental cost per QALY gained that is favourable compared to other disease-modifying, biological therapies.

PAR11

COST-EFFECTIVENESS ANALYSIS FOR TREATMENTS IN ANKYLOSING SPONDYLITIS

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OBJECTIVE: To perform a cost-effectiveness analysis on TNF-alpha inhibitors (Anti-TNFα) for treatment of Ankylosing Spondylitis (AS) in comparison to standard therapy alone from a societal perspective. **METHODS:** Decision-tree analysis was performed to estimate the incremental cost-effectiveness ratio (ICER) for Anti-TNFα treatments in AS patients. All model parameters (e.g. cost, response rates, EQ-5D derived utility values, etc.) were obtained from published literature and/or expert opinion. Total cost included cost relating to illness, drug, drug-related side effects, chest radiography for tuberculosis (TB) screening, TB treatment for TB+ patients, and annual drug monitoring. Cost of Illness (COI) included direct costs (e.g. total ambulatory/hospital care, diagnostic testing, assistive devices, travel to visits, nonallopathic treatments, etc.) and indirect costs (e.g. short-term leave, paid work disability, etc.). Informal caregiver cost was not included. Cost was linked to BASDAI and BASFI scores reported in the Kobelt study by performing OLS regression. The two resulting models ($BASDAI_{cost}$ and $BASFI_{cost}$) with regression equations: $\log COST = 3.168 + 0.145455 * BASFI$ and $\log COST = 3.594667 + 0.049879 * BASDAI$, respectively, were then used to estimate COI. Univariate Sensitivity Analysis was conducted to estimate percent changes in ICER from the base-case using parameters such as response rates, discount rates, and discontinued rates. QALYs and cost were discounted at 3%. **RESULTS:** The $BASDAI_{cost}$ model revealed an ICER of $46,990. Meanwhile, the $BASFI_{cost}$ model had an ICER of $38,636. In the UA analysis, the ICERs in the $BASDAI_{cost}$ and $BASFI_{cost}$ models varied from $36,068 to $66,472 and $22,766 to $66,539, respectively. Both models were sensitive to changes in response rates. However, overall, the $ASDAI_{cost}$ model was more robust than the $BASFI_{cost}$ model. **CONCLUSIONS:** In the UK, the threshold level recommended by NICE for treatment was about £30,000/QALY. This translates into US$53,589. Using the NICE threshold, Anti-TNFα treatment for AS is cost-effective from the societal perspective.

PAR12

A COST-EFFICACY ANALYSIS MODEL FOR ANTI-TNF AGENTS IN PSORIATIC ARTHRITIS

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OBJECTIVES: To provide a cost-efficacy (CE) analysis from a third-party payer perspective of etanercept and infliximab, compared to placebo in psoriatic arthritis patients. **METHODS:** An Excel based CE model was developed to estimate number needed to treat (NNT) and cost per successful outcome using published, 24-week CE data for etanercept and infliximab. Dosing information was obtained from product labels. Plan-specific drug costs, and administration costs were utilized in the model. The cost of adverse events was not included in the model. The NNT and cost per successful outcome were estimated using the American College of Rheumatology scores (ACR 20, 50, 70), the Psoriasis Area and Severity Index scores (PASI 50, 75, 90), and a combination of ACR and PASI scores. **RESULTS:** Based on the ACR scores, the NNT ranges were 2.6 to 4.0 for infliximab and 2.7 to 12.5 for etanercept. Using the PASI score, the NNT ranges were 1.5 to 2.6 for infliximab and 3.5 to 33.3 for