of economic modelling (e.g. cycle length), these estimates cannot be incorporated directly. The tool is designed to adapt to the requirements of cost models using various statistical methods. METHODS: From a systematic review, 4 studies reporting proportions of patients undergoing remission at different time points were identified. One of the studies reported data for 2 populations (CSU/CIU) and all chronic urticaria patients were treated with oral treatment. The study was carried out for 5 years. The data was extracted: (1) converting reported data to standard time units; (2) using the extracted data to run the Kaplan-Meier (K-M) analysis; (3) applying four statistical distributions (exponential, log-normal, weibull and log-logistic) to identify the distribution best fitting the literature estimates. Lowest Kolmogorov-Smirnov (KS) distance was chosen as the criterion for the best fit distribution. (4) values obtained from the best fit distribution were further converted into rates for each 4-week cycle length. The probability of escalation was 0.0005, 0.0005, 0.0005, and 1.0000 for years 1, 2, 3, and 4, respectively. CONCLUSIONS: This approach provides a robust statistical method for adapting the literature estimates as per the requirements of an economic model. Due to the wide range of remission rates, the results from a group discussion using an item-response-system is recommended to determine appropriate model inputs.

PRM87

EXPERT PERSPECTIVE ON THE TREATMENT OF FUNCTIONAL DYSPEPSIA AND MOTILITY DISORDERS: A MULTI-CRITERIA DECISION ANALYSIS USING THE ANALYTIC HIERARCHY PROCESS (AHP)

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OBJECTIVES: Functional dyspepsia or gastrointestinal disorders are extremely common and carry a significant personal and financial burden. AHP was used to reflect the experts' preferences on common treatment options for functional dyspepsia and motility disorders for the treatment of a representative Japanese patient. These data will be reported at the conference.

METHODS: On the basis of a literature search and qualitative patient (N=6) and expert interviews (N=6), a questionnaire was developed. By means of the analytic hierarchy process (AHP), the study elicited the priorities regarding various aspects of treatments of dyspepsia and motility disorders. The collection of data from experts of the field of gastroenterology was done in real time within the context of a group discussion using an item-response-system. RESULTS: As a result of the interviews, seven characteristics were established which were judged to be the most important. A total of N=20 experts took part in the group discussion and the AHP survey. For all participants the criterion “reduction of abdominal cramps” was the most important aspect. The results will be presented.

CONCLUSIONS: The AHP represents a suitable and scientifically transparent approach for the elicitation of experts’ priorities within the context of group discussions. The item response system served as a valuable instrument to collect the data. A questionnaire generated by the patient participation in a subsequent discrete-choice experiment will expand the findings of this study.

PRM88

THE IMPACT OF BASELINE HbA1C AND HbA1C TRAJECTORIES ON TIME TO THERAPY Eescalation IN TYPE 2 DIABETES MELLITUS

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OBJECTIVES: Demonstrating face validity in health economic models enhances the credibility and is important if the model’s output is to be robustly informing healthcare decision making. Type 2 diabetes (T2DM) models are typically complex and their results are influenced by multiple factors including treatment effects, cohort characteristics, choice of rescue therapies and structural settings, such as therapy escalation thresholds. The objective of this study was to illustrate the impact that baseline HbA1c and HbA1c trajectories exert on time to therapy escalation when using guideline therapy escalation thresholds compared with clinical practice. METHODS: Using the UKPDS 66 HbA1c trajectory equation implemented within the IMS CORE diabetes model, the time to therapy escalation was assessed as a function of baseline HbA1c (7.0%, 7.5%, 8.0% and 8.5%) with therapy escalation thresholds recommended by NICE (7.5%) versus those observed in clinical practice in the UK (5.8%). Published data informed initial HbA1c treatment effects of -0.093 per year (0.17%). Second order uncertainty was captured using baseline HbA1c, treatment reduction and HbA1c trajectories sampled, results were averaged over 5,000 simulations. RESULTS: Using NICE escalation criteria (7.5% mean; SD) time to escalation was 6.6 (0.6), 5.2 (0.5), 4.5 (0.5) and 3.5 (0.4) years for cohorts with baseline HbA1c of 7.0%, 7.5%, 8.0% and 8.5% respectively. Using escalation levels observed in clinical practice (8.5% mean; SD) time to escalation was 6.7 (3.2), 11.2 (2.4) and 8.9 (1.9) years for cohorts with baseline HbA1c of 7.0%, 7.5%, 8.0% and 8.5% respectively. CONCLUSIONS: The use of aspirational guideline based thresholds may be used in economic modelling that characterises the disease in terms of outcomes. Future studies should focus on understanding the gaps identified. This CM may be used in economic modelling and could form the foundation for developing disease-based MM models to explore the impact of treatment on outcomes.

PRM89

VALIDATION OF RISK FRxE RISK MODEL IN JAPANESE WOMEN COMPARED WITH FRANCE

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OBJECTIVES: Although the fracture risk assessment tool (FRAX) developed by WHO is considered to be valid and reliable, its algorithm is not open to public and is thus unavailable for economic evaluations. The purpose of this study was to develop a statistical model that correlates with FRAX to validate the model by comparing the predicted 10-year fracture probability from FRAX in our model and those derived from the FRAX. METHODS: Equations for age and femoral neck BMD specific incidence of hip, clinical spine, and other fracture were developed using a series of methods by De Laet, et al and epidemiological data of postmenopausal Japanese women. A patient-level state transition model with ten health states using the equations was used to model the 10-year probability of a hip fracture and a major osteoporotic fracture in Japanese women with osteoporosis, who had no treatments. We ran the model with different combinations of BMD (T-score 1.5, −2.0, or −2.5), and the number of previous fractures (0). The predicted 10-year probability of major osteoporotic fractures were compared with those of the FRAX. RESULTS: For 70-year-old women with different combinations of T-scores and the number of clinical risk factors, the estimated 10-year probabilities of hip fracture in our model were almost identical to those of the FRAX. The 10-year probabilities of major osteoporotic fracture in our model also appeared to be consistent with those of the FRAX. These findings supported the validity of our model in the use of health economic evaluation. CONCLUSIONS: This Japanese model appears to be valid for use in economic evaluation in osteoporosis from the perspective of Japan healthcare system. The relation between 10-year fracture probability and ICER of osteoporosis treatment can be estimated using this model.

PRM90

DEVELOPMENT AND VALIDATION OF A CONCEPTUAL MODEL OF MULTIPLE MYELOMA (MM) USING NICE ESCALATION CRITERIA (7.5%) TO ESTIMATE THE IMPACT OF TREATMENT ON OUTCOMES

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OBJECTIVES: To develop and validate a conceptual model (CM) of multiple myeloma (MM) using in economic modelling that characterises the disease in terms of outcomes that impact on disease progression and outcomes. METHODS: A draft CM was developed using two systematic literature reviews to identify attributes of MM that appeared to impact on progression and outcomes. We also identified the attributes that were grouped according to the aspects they measured (e.g. symptoms) and then linked to denote relationships across groups. This was discussed and validated by a Delphi panel of four MM experts. For simplicity, the CM did not consider the important transitions between clinical stages, which was reached about the attributes to be included in the CM: baseline and disease characteristics (age, comorbidities, Eastern Cooperative Oncology Group performance status and genetic factors), central associations (disease activity, complications and symptoms) and final outcomes (overall survival [OS], quality of life). Disease activity was measured by several factors, including M-protein and serum lactate dehydrogenase. There was consensus that most genetic factors [e.g. (6;14), del(13p)] influenced disease activity, which in turn affected complications (e.g. anaemia, renal complications). Symptoms (e.g. pain, bone fractures) were influenced by genetic factors and disease activity. Disease activity, comorbidities and complications impacted on OS. Consensus was not reached for the impact of age/comorbidities on complications/symptoms, nor for the influence of del(17p) on complications. CONCLUSIONS: There was agreement on the attributes that should be used to characterise and understand MM, however, the lack of consensus on the associations between some attributes is limited understanding of how aspects of MM impact on disease progression and outcomes. Future studies should focus on understanding the gaps identified. This CM may be used in economic modelling and could form the foundation for developing disease-based MM models to explore the impact of treatment on outcomes.

PRM91

DEVELOPMENT OF A COST-EFFECTIVENESS ANALYSIS FRAMEWORK FOR MODELING TREATMENT OF ALZHEIMER’S DISEASE AND MILD COGNITIVE IMPAIRMENT

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OBJECTIVES: With a variety of medical technologies under development to address the increasing prevalence of Alzheimer’s Disease (AD) and Mild Cognitive Impairment (MCI), stakeholders need methods to assess and compare their value. The Clinical Dementia Rating (CDR) Sum of Boxes (SOB) scale can be used to stage AD and MCI severity, but has not previously been incorporated into cost-effective ness models. We developed a GEM framework for characterising disease activity using the increasingly commonly used CDR-SOB endpoint. METHODS: A systematic literature review was conducted to identify published AD and MCI cost-effectiveness models that evaluated the CDR-SOB score. To facilitate use of this measure in future health economic evaluations, we developed a state-transition model that synthesizes prior study results to link CDR-SOB score changes to MMSE health states. We then applied standard US, Europe and Australia utility values to the trajectories of prior AD and MCI CEAs. RESULTS: We mapped CDR-SOB scores to MMSE health states using the results from Delar et al. (2013) and O’Bryan et al. (2008), and extrapolated long-term (5+ year) disease progression using a variety of curve fits. Based on the baseline CDR-SOB score distribution, patients were assigned to one of five health
states (preclinical, MCI, mild, moderate, or severe AD). Patients’ rate of progres-
sion through the health states was based on a weighted average of rates among
‘slow’ and ‘fast’ progressing patients (derived from the AD neuroimaging initia-
tive). Each state has unique utility and expenditure impacts. This lifetime horizon model tracks AD progression, life years, quality-adjusted life years, and expendi-
ture. In the new framework where in a treatment sequence the new treatment belongs
way for users to simulate long-term AD and MCI health outcomes and assess the
comparative effectiveness of strategies using a common trial endpoint.

PRM02
A COMPARISON OF DISCRETE EVENT SIMULATION (DES) VERSUS MARKOV
MODELS WITH A PRACTICAL APPLICATION TO HUMAN-IMMUNODEFICIENCY VIRUS
(HIV)
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OBJECTIVES: While conducting an economic evaluation, it is important to select an
appropriate model type and provide a justification. Many analyses utilise Markov
models but these are associated with a number of limitations. Discrete Event Simulation (DES) models, in which events are estimated using discrete time inter-
vals rather than states ( Markov) as a cohort, can overcome many of the Markovian limitations. The aim of this study was to assess the advantages and disadvantages of DES and Markov models; utiliz-
ing an application to HIV. METHODS: A systematic literature review was conducted to
develop modelling approaches assessing the cost-effectiveness of HIV treatments.
Additionally, the use of DES models within Health Technology Assessments (HTA) was evaluated. A de novo DES was developed in Microsoft Excel® with VBA, based on observational data from an existing treatment strategy evalu-
ating HIV treatments. RESULTS: Of the HIV publications identified, 4% used a DES
and 42% used a Markov model. Only 17% provided a discussion around their choice of
model type. DES models have not yet been used in HTAs for HIV in the UK but
nine were identified within other disease areas. The de novo DES and those in the
published literature demonstrated a realistic modelling approach due to the dis-
crete time structure. Accounting for drug costs in DES and Markov models is a challenge. Conclusion: DES models can accommodate future adaptations; however, it relies heavily
on data requirements in order to maximise its potential benefit. CONCLUSIONS: Neither Markov models nor DES are superior, the key is to choose the most suit-
able method for the decision problem and provide a clear rationale. In the context of HIV, DES is likely to be a good choice of model providing sufficient data is available.

PRM03
SELECTING EVIDENCE-BASED PREVENTIVE TREATMENT THRESHOLDS BY
OPTIMIZING PREFERRED OUTCOMES
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OBJECTIVES: We demonstrate an approach to select evidence-based preventive treat-
ment thresholds by optimizing preferred outcomes illustrated with a study on preven-
tive statin treatment based on 10-year coronary heart disease (CHD) risk predicted by the Framingham risk score (FRS). METHODS: A Markov decision-analytic model was used to determine the optimal preventive statin treatment for high-risk (FRS≥20%) individuals (ATPIII guideline), or, alternatively, an explorative approach of lowering treatment threshold T from 20.0% to 0.5% with 0.5% decre-
ments for 20-30-year old cohort (n=11,649) to calculate the probability of an event and the
cost of disease. RESULTS: The probability of a CHD event from age 20 to 80 years was
13.8% at T=1%, 16.8% at T=2%, 18.3% at T=3%, 19.2% at T=4%, 19.7% at T=5%, 20.0% at T=6%,
20.3% at T=7%, and 20.4% at T=8% with a maximum at 20.5% at T=9%. Conclusion: In a 20-year old cohort, lowering the threshold to 2% is associated with increased overall mortality and QALYs but associated with a marginal increase in costs. CONCLUSIONS: The FRS predicts CHD risk with high accuracy and is the most cost-effective method to identify the preventive statin treatment threshold.

PRM04
MODELING TREATMENT SEQUENCES IN HEALTH TECHNOLOGY ASSESSMENTS
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OBJECTIVE: As interventions available in a therapeutic area increase, the relevant
decision question in health technology assessment (HTA) expands to include iden-
tifying the optimal treatment sequences or positions for a treatment in a sequence.
This study reviewed economic models capturing treatment sequences published by National Institute for Health and Care Excellence (NICE). METHODS: Economic models including a treatment sequence were examined for the health economic impacts of HTAs generally provide comprehensive detail on modeling. The rationale for modeling a sequence, modeling technique used, and approach to characterizing clinical, cost and utility impacts were evaluated. RESULTS: Forty models were identified that considered treatment sequences in the following therapeutic areas:
32.5% oncology, 17.5% auto-immune, 15% cardiovascular, 10% neurolgy/mental
health, 15% infectious, 5% diabetes, and 15% other. Modeling techniques included
discrete event simulation (12%), individual state-transition (15%) and most com-
monly static state transition with tracking sequences. In most cases treatment sequencing was modeled to reflect clinical practice or clinical trial design. Other reasons included assessing whether in a treatment sequence the new treatment belongs
either to the remainder of the sequence. Key considerations for determining how best to model include: the number of treatment options, patient heterogeneity, key outcome measures, and treatment impact (time to effect). Conclusion: Treatment se-
quence models are the scarcity of the data clinical as clinical trials do not commonly study sequences.

PRM05
BUDGET IMPACT ANALYSIS OF CEREBROLYSIN IN THE TREATMENT OF ACUTE
ISCHEMIC STROKE OF MODERATE AND SEVERE DEGREES OF SEVERITY IN THE
RUSSIAN FEDERATION
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OBJECTIVES: To conduct budget impact analysis of neuroprotective and neuropro-
genotic agents. The cost of the cerebrolysin therapy calculation compared to standard therapy only of ischemic stroke of moderate and severe degrees of severity according to the Russian healthcare system. METHODS: The one year budget impact analy-
sis was conducted. We used an epidemiological model of Russian healthcare system - budget impact analysis and analysis of the direct and indirect costs. For reference, we accepted the exchange rate was 1 EUR = 60.64 RUB. RESULTS: Direct costs included cost of cerebrolysin, hospitalization, medical care, new model's (cerebrolysin)
and outpatient - polyclinic medical care, as well as the cost of early neurorehabilitation, and indirect costs - the loss of gross domestic product as a result of disability and death, payments for sick leave and disability cost. As a result, the overall costs of standard treatment with cerebrolysin totaled 578 278 RUB (6238 EUR), while the cost to standard therapy was 457 981 RUB (7552 EUR). Reducing the direct and indirect costs was obtained in the treatment group of cerebrolysin, because of lower mortality and reduce days of hospital stay compared with the standard therapy. CONCLUSIONS: The results of budget impact analysis showed that the inclusion of cerebrolysin in standard therapy of ischemic stroke of moderate and severe degrees of severity can reduce the over-
tal costs of 1% of the Russian health care system at 79 703 EUR (1314 EUR per patient per year.

PRM06
A COMPARISON OF THREE SURVIVAL MODELS TO ESTIMATE THE
COST-EFFECTIVENESS OF CANCER IMMUNOTHERAPY IN THE TREATMENT
OF ADVANCED MELANOMA
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OBJECTIVES: To determine which extrapolating survival curves for previ-
ously untreated patients receiving nivolumab versus ipilimumab for BRAF wild-
type advanced melanoma (AM, comprising unresectable Stage III and/or Stage IV metastatic melanoma). METHODS: Patient-level data from 203 patients with AM receiving nivolumab or ipilimumab in a phase III RCT study (NCT013017998) were used to estimate hazards of progression and death. Of these, 56.2% (n=114) progressed and 23.3% (n=47) died during the study period. Weibull, log-logistic and a Weibull mixture (the MCM) were fitted to extrapolate data for overall survival (OS) and progression-free survival (PFS) up to a 10 year time horizon. To estimate transition probabilities for subjects receiving ipilimumab, hazard ratios were cal-
culated by indirect comparison of nivolumab versus ipilimumb and applied to underlying survival distributions. Models were evaluated graphically, using Akaike’s Information Criterion (AIC) and naive comparison of the extrapolated ipilimumb survival functions with published long-term survival data. RESULTS: AIC scores for the Weibull, log-logistic and MCM were 336.47, 335.80 and 376.20 for OS, respectively. The equivalent AIC scores for PFS were 511.39, 479.38 and 421.63. The estimated 3-year survival rate of patients receiving nivolumab was 2.8%, 15.1% and 55.8% and 14.9%, 40.2% and 87.2% for patients receiving nivolumab using the Weibull, log-
logistic and MCM, respectively. This compares with published data showing approxi-
mately 21% (95% CI: 17-24%) of AM patients receiving ipilimumb (3 mg/kg) survive three years. Due to the short follow-up period in this study, the MCM introduced the greatest potential for error. CONCLUSIONS: The log-logistic model provided the closest approximation to real-world ipilimumb data. The choice of parametric model exerts a large effect on predicted effectiveness and cost-effectiveness of new therapies and needs to be considered in sensitivity analyses to estimate their impact on ICERs.

PRM07
ECONOMIC AND CLINICAL IMPACT OF SECONDHAND SMOKE IN KOREA
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OBJECTIVES: To examine economic and health outcomes of secondhand smoke exposure have been studied in many countries. Nevertheless, the economic burden of smoking, especially focusing on secondhand smoke is rarely dealt with. METHODS: We reviewed previous studies which demonstrated the