A Markov cost-utility analysis of escitalopram and duloxetine for the treatment of major depressive disorder
Armstrong EP, Malone DC, Erder MH

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to compare the cost-effectiveness of two branded treatments for major depressive disorder. The authors concluded that escitalopram was more effective and less costly than duloxetine. The methodology appears to have been appropriate and, on the whole, was clearly and transparently reported. The conclusions reached by the authors appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of two treatments for major depressive disorder.

Interventions
The two treatments were duloxetine, a selective serotonin and norepinephrine re-uptake inhibitor, and escitalopram, a selective serotonin re-uptake inhibitor. Different doses for both treatments, as commonly used in the authors’ and other clinical settings, were considered.

Location/setting
USA/primary care.

Methods
Analytical approach:
This economic evaluation used a Markov model with a one-year time horizon. The perspective stated by the authors was that of the third-party payer (the managed care organisation).

Effectiveness data:
The effectiveness data were obtained from randomised placebo-controlled trials, which were identified by a review of the literature in the MEDLINE database. The basic characteristics of these trials were reported. Some assumptions were required and were reported. For efficacy and adverse effects rates, estimates from the literature were combined and point data for the model were estimated using the beta distribution. The primary outcome was the treatment efficacy (remissions) and secondary ones were the treatment switch, titration, and augmentation.

Monetary benefit and utility valuations:
The utility values for the different depression health states were obtained from a previous study, the details of which were not reported.

Measure of benefit:
Quality-adjusted life-weeks (QALWs) were the summary measure of benefit.

Cost data:
The economic analysis included the costs of medication and adverse effects, modelled using a gamma distribution. Medication costs were based on their average wholesale prices, using a cost-to-charge ratio of 20% to reflect the true costs to the managed care organisation. Professional costs were obtained from national sources. The currency was US
dollars ($) and the price year was not explicitly reported.

Analysis of uncertainty:
The parameter uncertainty was investigated using one-way sensitivity analysis on specific model parameters. Probabilistic sensitivity analysis was also conducted based on Monte Carlo simulation with first- and second-order sampling. A threshold analysis for medication costs was conducted.

Results
Over a one-year period escitalopram resulted in a cost of $907 (95% CI 894 to 919) and duloxetine resulted in a cost of $1,633 (95% CI 1,614 to 1,654). The mean QALWs were 41.0 (95% CI 40.7 to 41.3) for escitalopram and 38.2 (95% CI 37.9 to 38.4) for duloxetine.

Escitalopram was the dominant treatment as it was both more effective and less costly than duloxetine.

All the sensitivity analyses showed that escitalopram was the dominant strategy compared with duloxetine.

Authors' conclusions
The authors concluded that escitalopram was more effective and less costly than duloxetine for the treatment of major depressive disorder.

CRD commentary
Interventions:
The rationale for the selection of the interventions was explicitly reported. The authors compared two branded treatments and excluded generic options.

Effectiveness/benefits:
The effectiveness data were obtained from randomised placebo-controlled trials. The basic characteristics of the primary sources (study population, design, and follow-up) were provided and the issue of heterogeneity among these sources was addressed. None of these trials compared the two treatments head-to-head, which was a limitation acknowledged by the authors. The utility values assigned to different health states were reported, but limited information on the derivation of these values was provided. QALWs, like quality-adjusted life-years, are a validated benefit measure allowing cross-disease comparisons to be made.

Costs:
The costs appeared to reflect the perspective stated. An extensive breakdown of cost items was provided, but no information on resource consumption was given. The price year was not reported, which will hinder future reflation exercise. The uncertainty surrounding the cost estimates was evaluated by sensitivity analysis.

Analysis and results:
The synthesis of the costs and benefits was appropriately performed. The results of the base case and the sensitivity analysis were clearly reported using a tornado diagram and an incremental cost-effectiveness scatter plot. The authors acknowledged some of the potential limitations of their study, including how robust the utility estimates were and the nature of the primary studies from which the estimates of effectiveness were obtained.

Concluding remarks:
The methodology appears to have been appropriate and, on the whole, was clearly and transparently reported. The conclusions reached by the authors appear to be appropriate.

Funding
Funded by Forest Research Institute, Jersey City, NJ, USA.

Bibliographic details
Armstrong EP, Malone DC, Erder MH. A Markov cost-utility analysis of escitalopram and duloxetine for the treatment