Under what conditions is feedback microwave thermotherapy (ProstaLund Feedback Treatment) cost-effective in comparison with alpha-blockade in the treatment of benign prostatic hyperplasia and lower urinary tract symptoms?

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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.

Health technology
The authors studied treatment with feedback microwave thermotherapy, specifically ProstaLund Feedback Treatment (PLFT).

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised Swedish patients with lower urinary tract symptoms (LUTS) arising from benign prostatic hyperplasia (BPH).

Setting
The setting was secondary care. The economic study was carried out in Sweden.

Dates to which data relate
The effectiveness evidence was obtained from studies published between 1997 and 2003, while resource use came from literature published between 2002 and 2004. The price year was 2003.

Source of effectiveness data
Data collected for input into the model included the following:

- disease severity at initiation of treatment;
- the rate of disease improvement per unit of time;
- the full treatment effect (as a percentage) of PLFT (measured as a reduction in IPSS from 19 at initiation of treatment to approximately 7);
- the full treatment effect of alpha-blockers (reduction in IPSS from 19 at initiation of treatment to approximately 11);
- time for the PLFT intervention;
- re-intervention after PLFT; and
alpha-blocker dosage.

**Modelling**  
The authors applied a disease progression model within Swedish treatment practice, using data from published studies, treatment programmes, official price lists and discussion with clinical experts. The model incorporated information on resource use, costs, survival probabilities, probabilities of disease progression, and health effects in terms of the International Prostate Symptom Score (IPSS) and quality of life (QOL) weights. Primary outputs from the model were the costs and health effects, expressed as the quality-adjusted life-years (QALYs) for each treatment. A 3-year time horizon was adopted.

**Sources searched to identify primary studies**  
Data concerning the full treatment effect were taken from several published reports, but no further information was provided as to these sources. Data concerning the rate of improvement per unit of time was taken from a single randomised controlled trial which also informed disease severity at initiation and the treatment effect of alpha-blockers. Re-intervention after PLFT was calculated from a single cost-consequences analysis, while alpha-blocker dosage was informed by treatment guidelines.

**Methods used to judge relevance and validity, and for extracting data**  
The authors did not report the methods they used to obtain their data, apart from saying that they used published literature, treatment programmes and official price lists. They did not report specifically which sources were searched for published data, or any inclusion and exclusion criteria for their search. The authors seem to have selected sources that provided evidence relevant to the model. In some cases they used primary sources to calculate the necessary data.

**Measure of benefits used in the economic analysis**  
QALYs were used as the summary measure of health benefit. QOL weights were taken from a published source (Trueman et al. 1999, see ‘Other Publications of Related Interest’ below for bibliographic details) that used the EuroQol (ED-5D) questionnaire and a visual analogue scale (VAS). QOL weights were aligned to the magnitude of the treatment effect and combined with age-related survival probabilities for Sweden in order to estimate the QALYs. The health outcomes were discounted at a rate of 3% in the base-case analysis and at rates of 0, 5 and 10% in the sensitivity analyses.

**Direct costs**  
The cost analysis was carried out from the perspective of the health care sector, although the authors did not specify whose perspective within this sector was actually used (e.g. third-party payers, state health care providers). The costing information was derived from the review of the literature, from assumptions, and from information from the International Classification of Diseases-10 diagnosis codes. The analysis focused on the costs of PLFT, alpha-blockade, and later disease progression and re-intervention. The base-case time horizon was 3 years. The costs were discounted at a rate of 3% in the base-case analysis and at rates of 0, 5 and 10% in the sensitivity analyses. The price year was 2003.

**Statistical analysis of costs**  
The costs were treated deterministically.

**Indirect Costs**  
The authors reported that only direct costs were included as most of the patients were older than 65 years of age.

**Currency**  
Swedish kroner (SEK). The conversion rate to euros (EUR) was EUR 1 = SEK 9.1.
Sensitivity analysis
Extensive one-way sensitivity analyses were used to gain an understanding of the influence of uncertainty in the data. All variables were subject to variation.

Estimated benefits used in the economic analysis
The number of QALYs gained as measured by the EQ-5D was 2.314 for PLFT and 2.216 for alpha-blockade (difference 0.098).

The number of QALYs gained as measured by the VAS was 2.036 for PLFT and 1.968 for alpha-blockade (difference 0.068).

Cost results
The cost of PLFT was EUR 1840 and the associated cost of re-treatment was EUR 219.

The cost of alpha-blockade was EUR 1411.

The difference in cost was EUR 648.

Synthesis of costs and benefits
The incremental cost per QALY for PLFT relative to alpha-blockade was EUR 6,609 as measured by the EQ-5D and EUR 9,525 as measured by the VAS.

The authors reported that PLFT became the dominant treatment alternative (less costly and more effective) beyond a 5-year treatment horizon. The results were also found to be sensitive to the full treatment effect.

Authors' conclusions
When considering quality of life (QOL), especially over a period longer than 1 year, ProstaLund Feedback Treatment (PLFT) is more cost-effective than pharmacological treatment.

CRD COMMENTARY - Selection of comparators
The authors compared the use of PLFT with alpha-blockade treatment. This choice of technologies was informed by the ability to treat BPH with both microwave therapy and pharmacological methods. You should decide whether these technologies are appropriate within your own setting.

Validity of estimate of measure of effectiveness
Data were estimated from a number of sources and the authors clearly reported how each specific data input value was derived from a specific source. Some data inputs were informed by a single published paper, and further details of these sources would have been useful to improve the validity of the results. The authors could have provided more information about how they searched for the available literature. For instance, which sources were searched, the inclusion criteria, and how the authors ensured comparability between the data. Without such data it is difficult for the reader to assess the quality of the data inputted into the model.

Validity of estimate of measure of benefit
The authors used QALYs as their summary measure of health benefit. This is a generic measure that enables comparability across a broad range of health-related technologies. Utility weights were taken from a published source. The inclusion of both EQ-5D and VAS scores provided a useful comparison that improves the validity of the results presented.
Validity of estimate of costs
Although the authors stated that the costing was carried out from the perspective of the health care sector, it was unclear exactly whose perspective this referred to. For instance, third-party providers and state provision of health care both operate within the health care sector. Therefore, it was not possible to assess whether all the relevant costs were incorporated in the analysis. The sensitivity analysis gives the reader an understanding of the impact of cost variables and improves generalisability to a range of settings. Nevertheless, the analysis would have been improved had a specific perspective been identified. Despite this, the cost analysis was carried out well, with sources clearly identified, a price year stated for comparison, and costs discounted to take account of the 3-year time horizon.

Other issues
The authors noted that studies comparing PLFT and alpha-blockade had not been carried out, thus it was not possible for them to make direct comparisons with previous work. The authors provided a range of results for interpretation by the reader. However, the base-case analysis was a 3-year horizon whereas the authors emphasised results for the 5-year horizon, principally because 5 years was found to be a threshold at which relative cost-effectiveness was altered. The conclusions drawn were an accurate reflection of the results presented and the scope of the study. Several limitations of the study were noted. For example, the lack of long-run data in this area, especially data from randomised controlled studies. Finally, the authors noted the importance of the modelling approach for improving the generalisability of the results, for instance to other countries with small amendments, and for exploring effectiveness within specific population sub-groups.

Implications of the study
The authors recommended that further clinical trials include patients with less pronounced symptoms and use both generic and specific QOL data.

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Other publications of related interest
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