

A model-based cost-effectiveness analysis of epidural blood patching vs. conservative management for the treatment of post dural-puncture headache

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ABSTRACT

Post-dural puncture headache (PDPH) is a common complication of spinal and epidural anaesthesia.

Headache severity ranges from mild to severe and most headaches will resolve spontaneously.

Treatment options include conservative management with simple analgesia or epidural blood patching (EBP), which involves injection of blood into the epidural space to seal the dural tear.

EBP has a high success rate but can have complications.

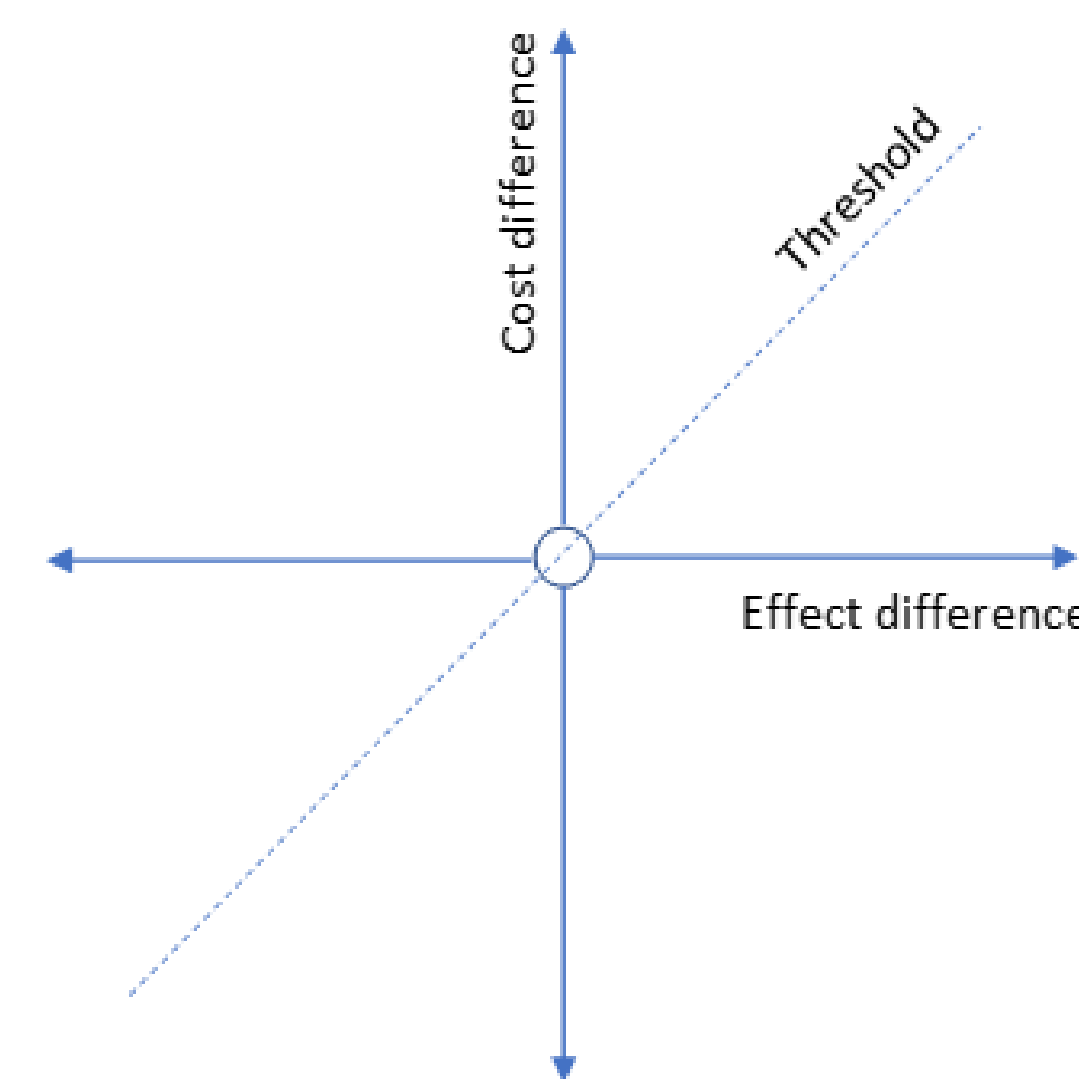
This analysis compares the costs and effects of epidural blood patching with the costs and effects of conservative management in PDPH.

A Markov model captures costs and effects of each treatment strategy to present a cost-utility analysis

INTRODUCTION

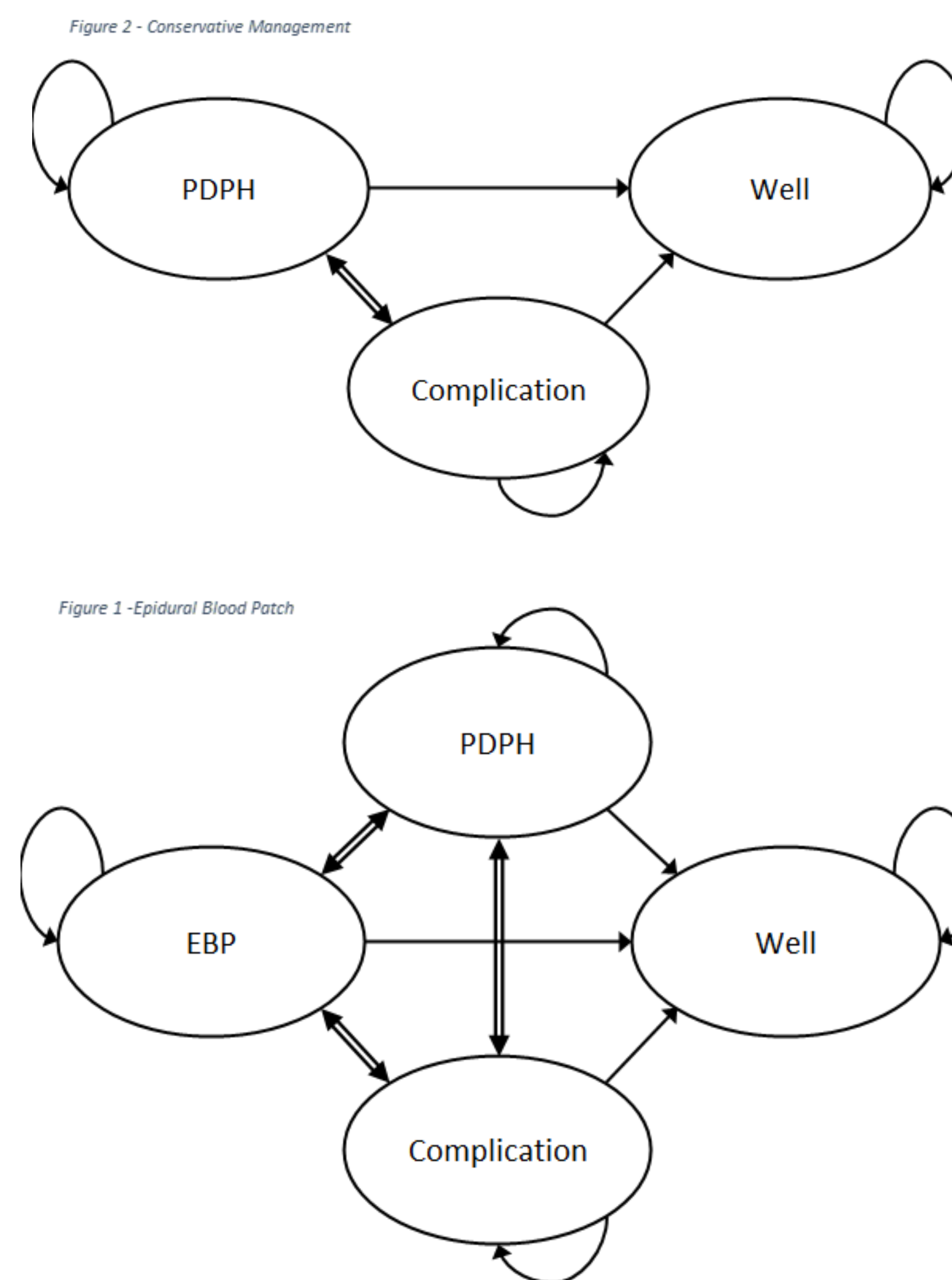
We may know that an intervention is effective, but how do we know if it represents good value for money?

- Costs in £s and effects in the form of Quality Adjusted Life Years (QALYs) are collated to give a cost/QALY for each treatment option.
- The difference between the cost/QALY for each treatment option is calculated to generate an incremental cost-effectiveness ratio (ICER).
- The ICER is compared to a threshold value (usually set at £20-30,000 in the UK) to determine cost-effectiveness.



METHODS

A Markov model uses probability to transition a population through mutually exclusive health states



A cost and a utility value (used to generate QALYs) were assigned to each health state.

Costs were taken from NHS tariffs and utility values from published literature.

The model was cycled 365 times to represent a 1-year period.

Costs and utility values were collated and an ICER value was calculated

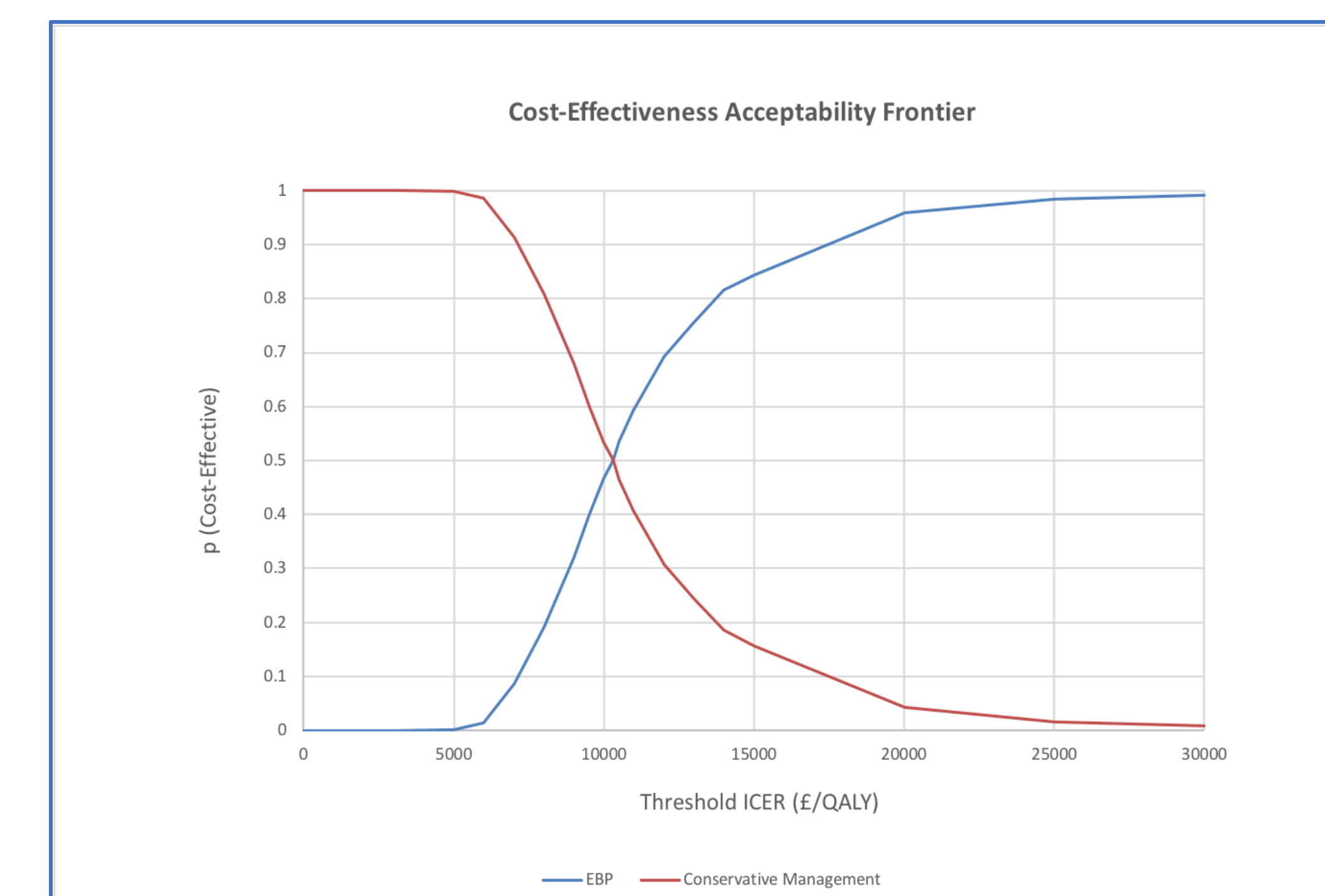
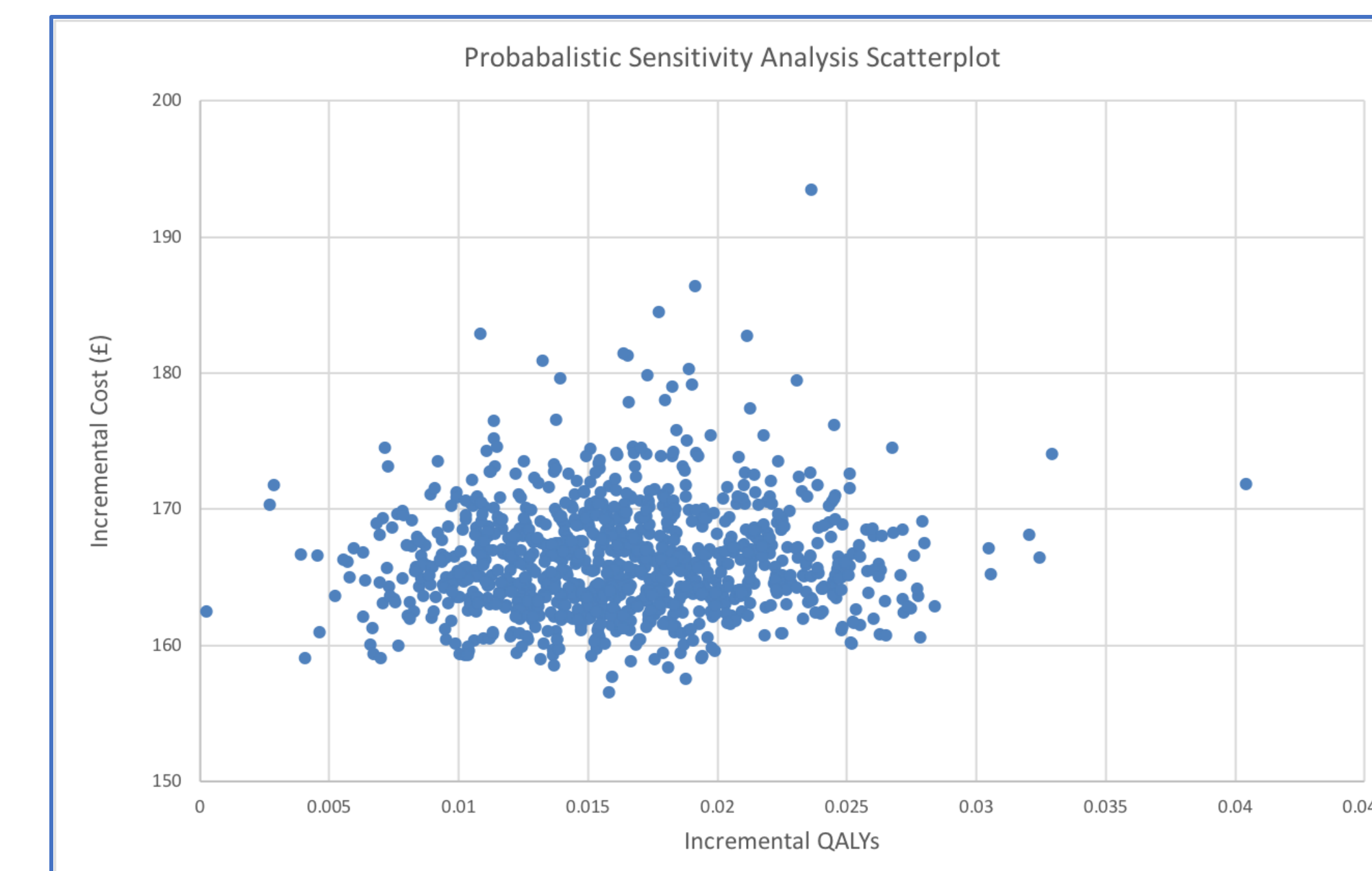
A probabilistic sensitivity analysis was performed.

RESULTS

Using a base case set of parameters, an ICER of £10,329/QALY was generated

This suggests EBP is cost-effective versus conservative management at a threshold of £20,000/QALY

A probabilistic sensitivity analysis offers a 95.8% certainty that EBP is cost-effective at this threshold



DISCUSSION

It is important to be able to justify health expenditure and get the most out of the money spent.

There is an appetite for proving that healthcare interventions are cost-effective, so cost-effectiveness analyses, which collate costs and consider them in the context of quality of life, allowing comparison with other interventions, are valued by decision makers.

The cost-effectiveness of epidural blood patching had not previously been established

Future Research

Whilst it is generally assumed that EBP is a low cost, highly effective intervention in the management of PDPH, data on effectiveness is not robust. A controlled trial with long term follow-up to demonstrate success rates, complication rates and impact on quality of life is missing from the evidence base.

Measures of quality of life amongst a population of PDPH sufferers could be undertaken to assess impact of acute and chronic PDPH.

Mapping the changing nature of PDPH over time would allow more accurate modelling of its impact in the long term.

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