Using Value of Information Analysis in combination with an early stage model of Aortic Stenosis to inform future research needs in patients who are currently eligible for AVR but could switch to 'CoreValve'

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Oxford Outcomes

Overview

- What and Why
- Clinical Background
- Introduction of model
- Key results
  - PSA
  - EVPI
  - EVPPI
- Conclusions

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Axioms (personal opinion)

- All relevant information (efficacy, cost, benefits) should be included in any reimbursement decision
    - Decision analytic model mode of synthesis
- Decision should be based on maximum expected benefit

- Current model should be used to inform future data collection
    - Target areas which will have greatest impact on decision uncertainty

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How do we do that then?

- Develop a fully probabilistic economic model

- Difference between expected benefit in an ideal world (no decision uncertainty) and actual imperfect world

- More technically, it is the difference between maximum expected net-benefit and expected maximum net-benefit

- Represents the theoretical upper threshold in terms of impact on decision uncertainty

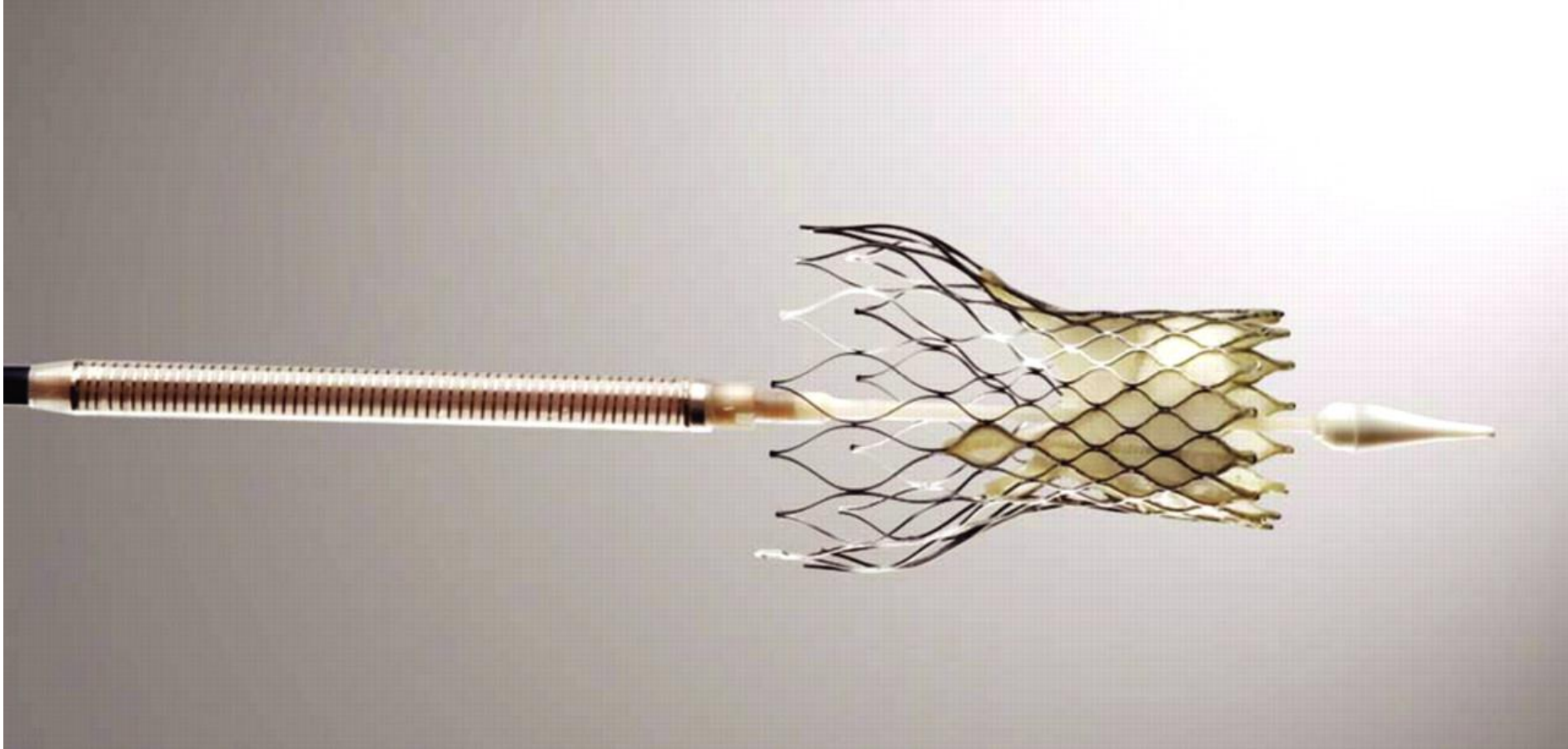- Can be calculated at the overall (EVPI) or parameter (EVPPI) level

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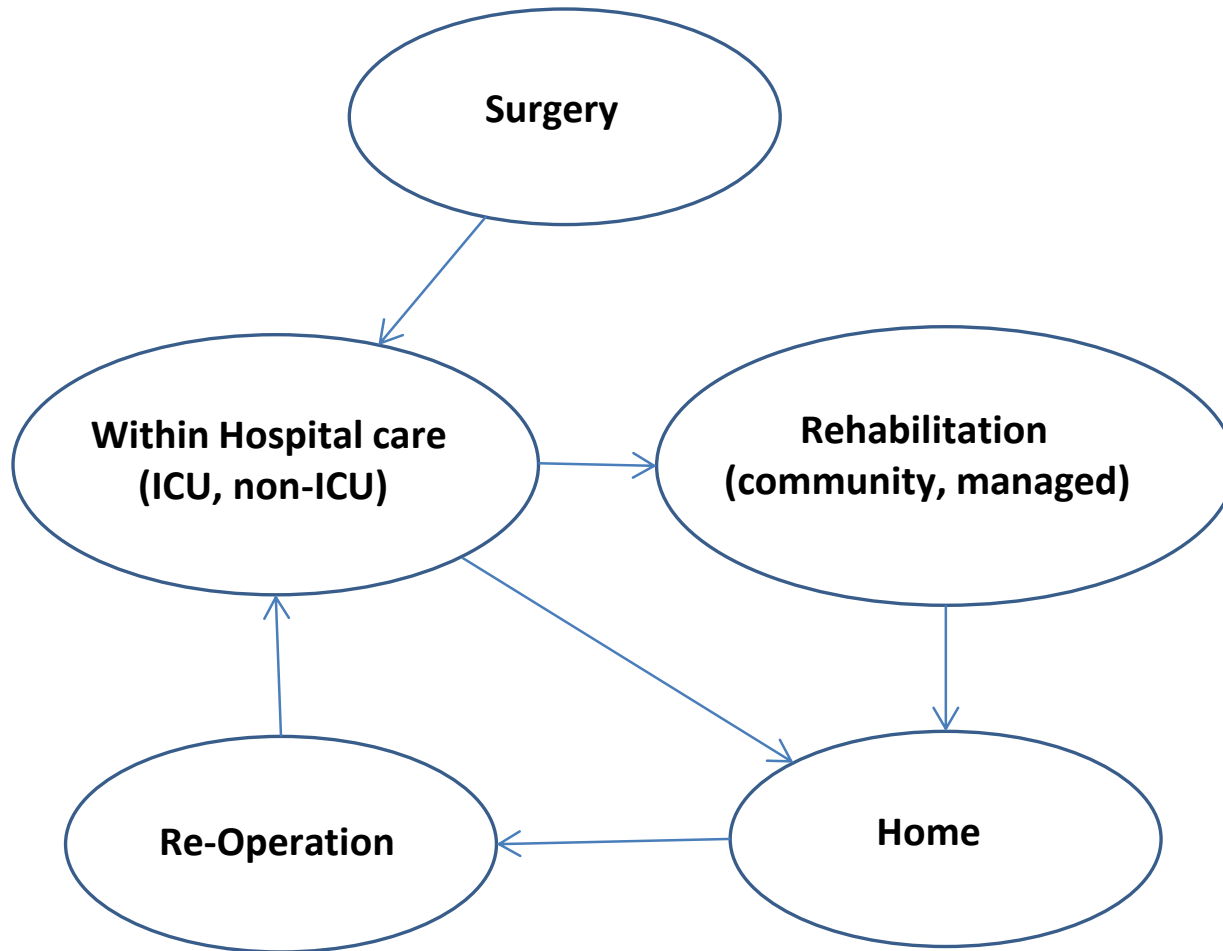
Aortic Stenosis
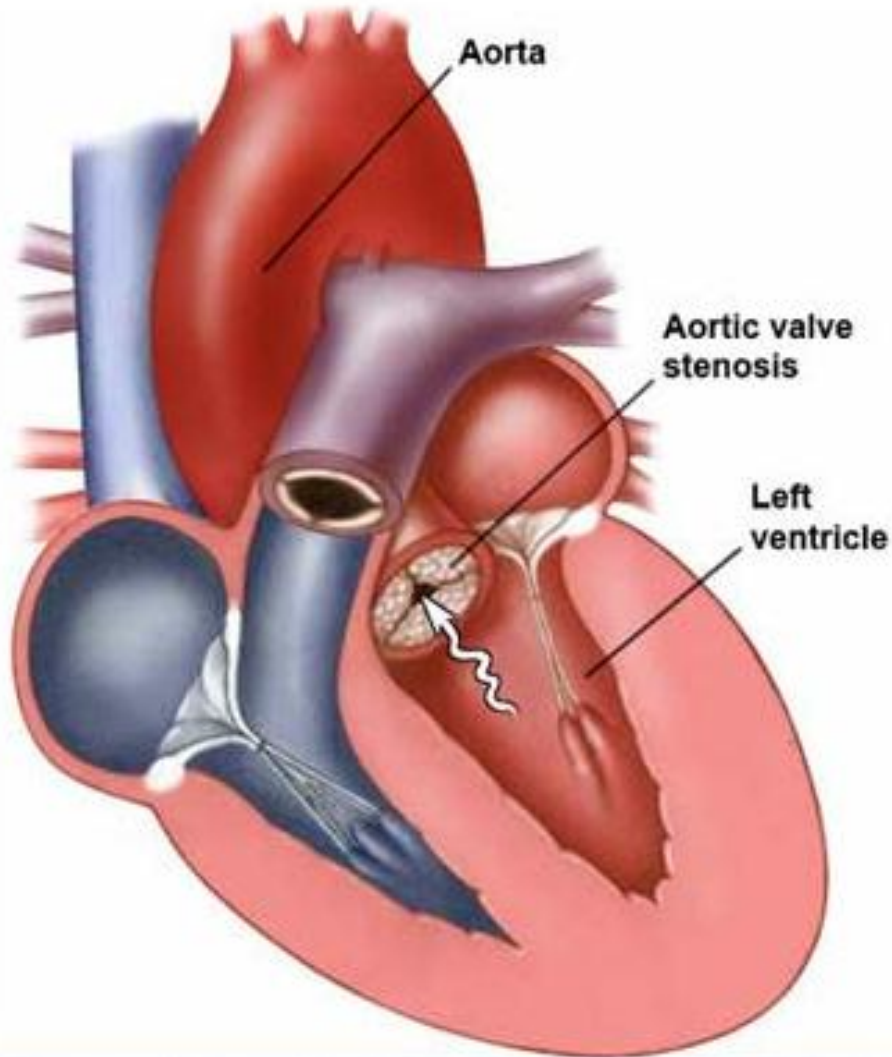
CoreValve

Overview

- What and Why
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- **Introduction of model**
- Key results
  - PSA introduces decision uncertainty
  - EVPI
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Model Overview

Key Model Parameters/ Assumptions

| Parameter	Assumption	Rationale/ source
Starting age	80	Literature review
Time horizon	10 years	Modelling assumption
Discount rates	3.5% p.a.	NICE reference case
Short term treatment effect	0.58	Literature review/
Long term treatment effect	1.00	Assumed no difference post 30 days
Baseline utility	Time dependant	Mathematical function used to age population
Utility decrement (AS)	0.20	Randomised controlled trial
HRQoL effect (treatment)	Apparent over time	Alternative assumption of immediate effect felt unrealistic
Procedure costs	£16,500 / £12,200	Medtronic / DRG
Length of stay	5 / 10 days	Literature review

Additional VoI Parameters

Parameter	Assumption	Rationale/ source
Decision horizon	10 years	In line with time horizon used in main analysis
WTP threshold	£30,000 per QALY gained	Upper value used by NICE in reimbursement process
Annual incident population	4,900	Review of epidemiological literature / UK population estimates
Discount rate	3.5% p.a.	In line with main analysis

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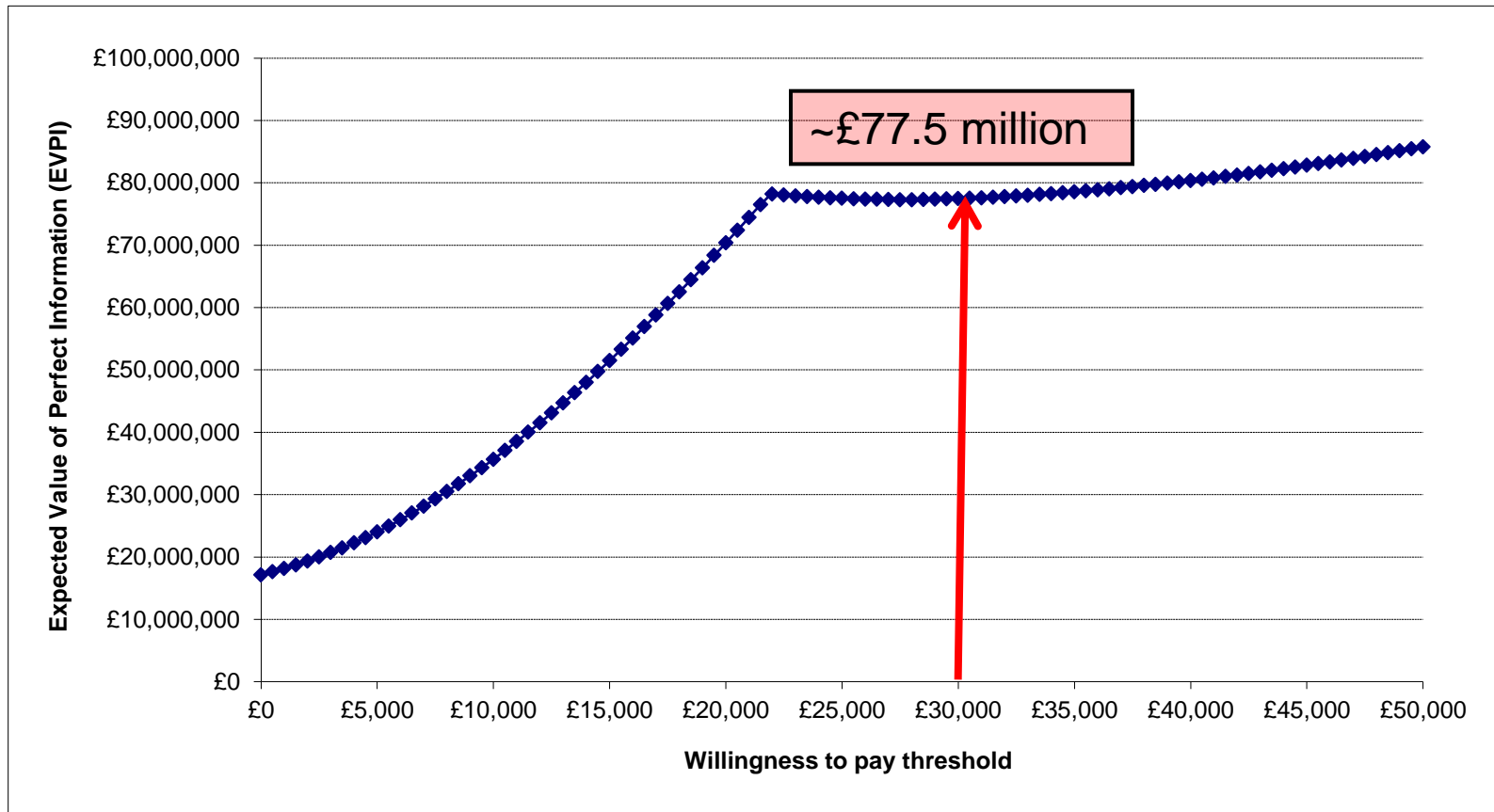- **Key results**
    - PSA
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Results (I)
Estimation of decision uncertainty

Willingness to pay threshold (£UK)

SAVR TAVI
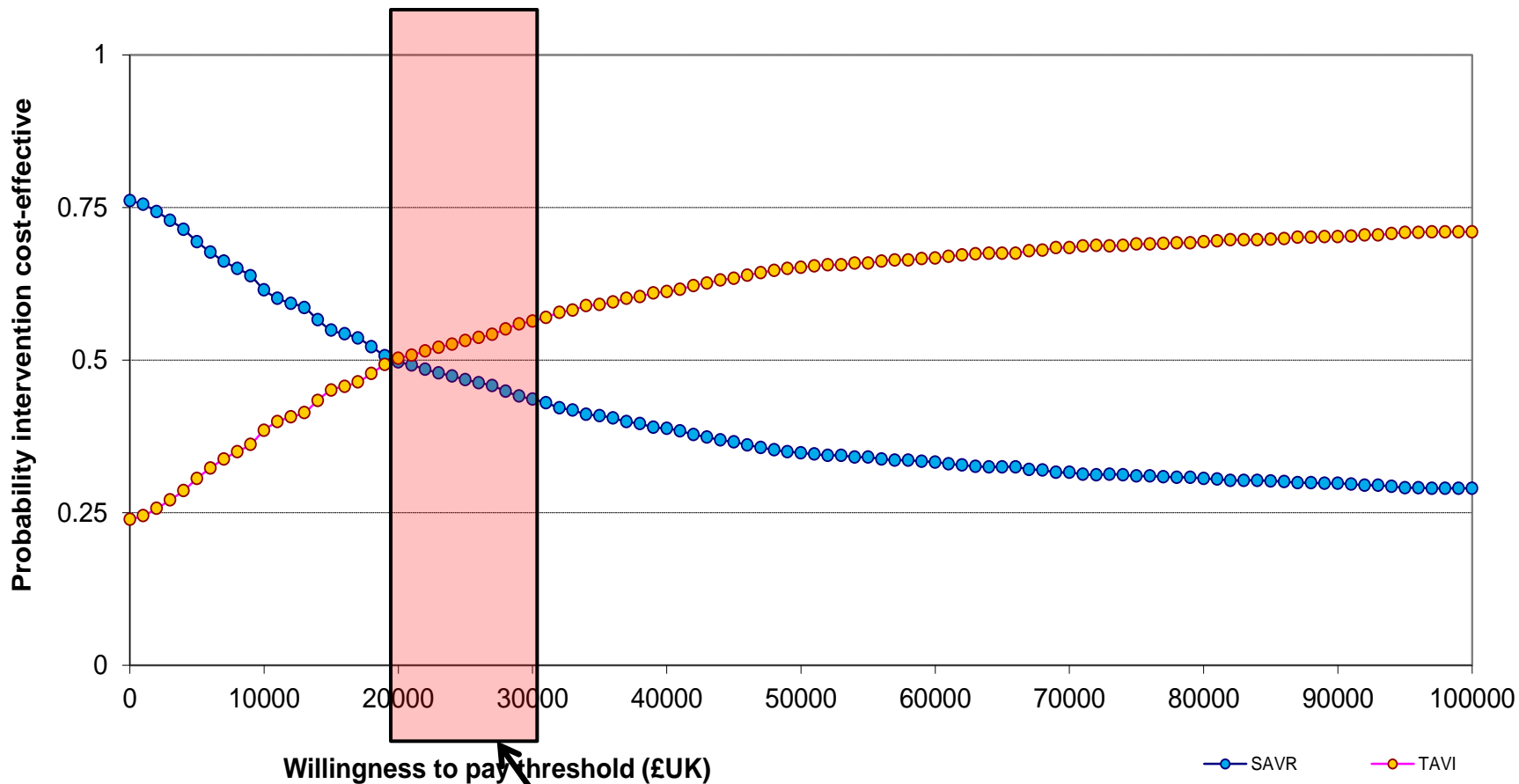
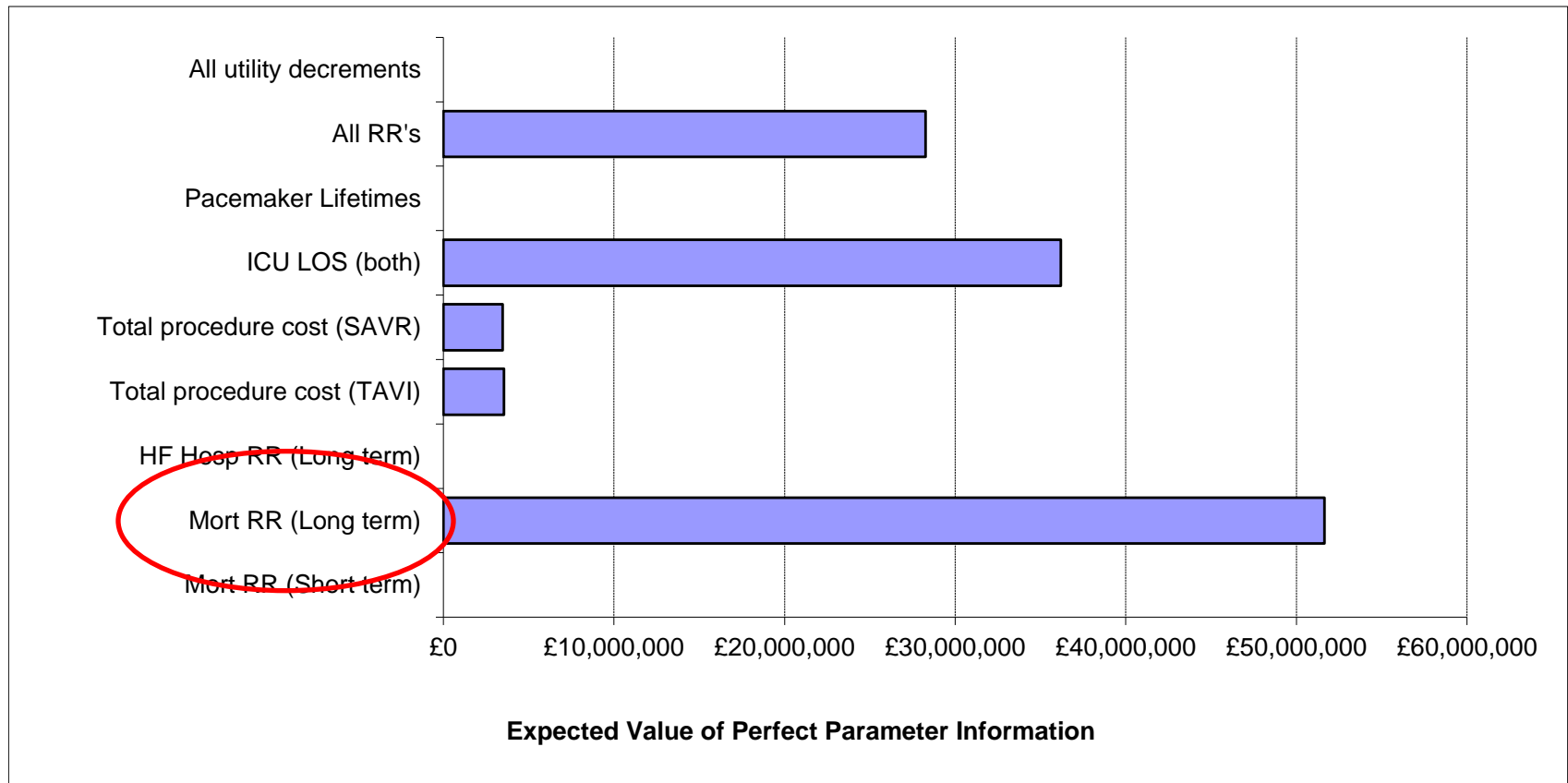Decision uncertainty quite high

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Results (II)
EVPI

Results (III)
Selected EVPPI

Overview

- What and Why
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- **Conclusions**

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Conclusions: Specific

- Despite high level of decision uncertainty, CoreValve had a higher probability of being cost-effective at £30,000 / QALY gained

- Future research could potentially have a major impact in terms of value of information

- Key areas where further information would have the greatest impact were treatment effect and cost related

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Conclusions: General

- Identify parameters/ assumptions that have the greatest impact on cost-effectiveness
  - Cross-border model adaptation?
- Can (I think) be used to explore impact of alternative forms of uncertainty
  - Need to build into model
- Despite limitations, better than alternative
  - Clinicians will always think of 'important' questions
  - 'perfect should not be the enemy of the good'

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Questions?

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