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Evaluating Cost-Consequences and Digital Transformation Through Concentric Consent: An Impact Assessment at Oxford University Hospitals NHS Foundation Trust

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Introduction

Concentric is a digital consent platform designed to support safe, efficient, and patient-centred consenting by enabling clinicians to provide tailored information and consent documentation digitally, while offering patients the opportunity to review and confirm consent outside the clinic environment (1,2).

Paper-based consent systems are often associated with avoidable administrative burden, workflow delays, and increased risk of error and day-of-surgery delays due to missed or incomplete forms, thereby disrupting patient care and generating unnecessary costs for the health system (3–7). Critically, "failure to warn" has contributed to substantial litigation payouts (3–7).

By evaluating the early impact of Concentric at Oxford University Hospitals (OUH), this study seeks to explore the potential of digital consent to address these long-standing challenges—both from stakeholder-experience and cost-saving perspectives.

Methods

A mixed-methods approach combined:

1. Stakeholder Engagement

One focus group, comprising 11 multidisciplinary staff members (consultants, nurses, administrators, and fellows), explored the usability, integration, and workflow impact of Concentric. Feedback was thematically analysed and rated on a 5-point Likert scale.

2. Economic Analysis

A cost-consequence model was developed in Microsoft Excel (version 2024) from the NHS and Personal Social Services perspectives, following the NICE reference case methodology.

Real-world data (Jan–Sep 2024) included:

- Mean monthly consent volume: 825 episodes
- Staff time per consent episode (consultants, nurses, administrators)
- Incomplete forms (1.95%) and treatment delays (1.6%)
- Implementation costs: licences, devices, training
- Historical medicolegal exposure: 2% claim incidence; £25,000 per claim

Two horizons were modelled:

Short-term: 8-month real-world implementation

Long-term: 3-year projection (training benefits, digital infrastructure)

No discounting or inflation adjustments were applied.

Outputs include cost per consent episode, time savings, and cumulative cost differences between paper-based and digital consent systems.

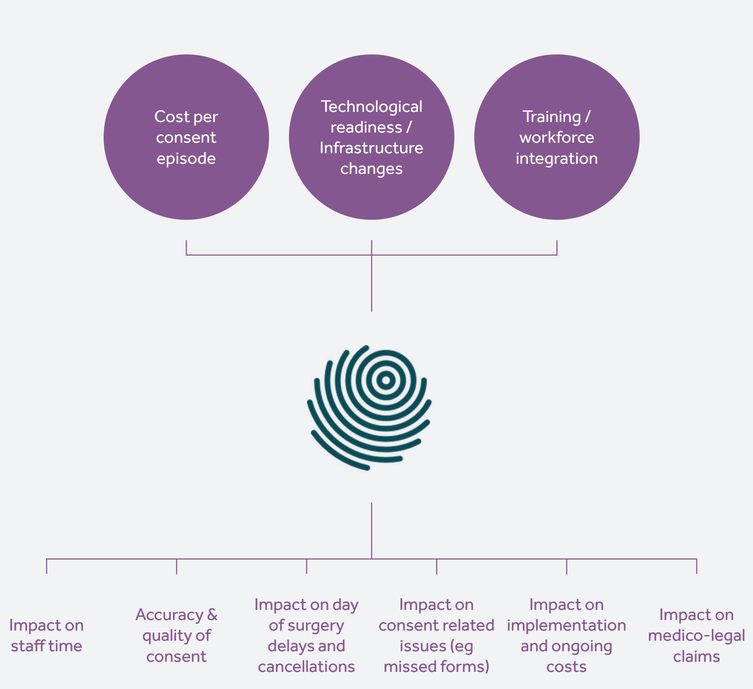

Figure 1: A simplified diagrammatic representation of the preliminary health economic inputs and outputs.

Aims & Objectives

Health Innovation Oxford and Thames Valley (HIOTV) conducted a mixed-methods evaluation of Concentric's deployment at Oxford University Hospitals (OUH) to:

- Assess stakeholder experience- usability, integration, and perceived value.
- Identify adoption factors- enablers and barriers to sustained use across OUH and the NHS.
- Evaluate cost impact- comparing Concentric with paper-based consent in Ophthalmology.

Results

Stakeholder Engagement

High acceptance: Staff found Concentric intuitive and easier than paper forms.

Benefits: Faster access to consent records, improved legibility, and the ability to share forms electronically for better-informed discussions and shared decision-making.

Patient impact: Enhanced satisfaction, especially for patients reviewing documentation at home.

Challenges: Early Wi-Fi issues and logout risks were resolved through IT fixes and staff awareness.

Confidence: All stakeholders expressed trust in system security and reliability once embedded.

Economic Analysis

Cost per episode: Reduced from £25.18 (paper) to £19.54 (digital).

Cost savings: £37,209 over 8 months; projected £167,437 over 3 years.

Time savings: 7.14 minutes per consent episode.

Operational improvements: No missed forms (previously 1.95%) or treatment delays post-implementation.

Risk mitigation: No consent-related medicolegal claims vs. 2% historical incidence (avg. £25,000 per claim).

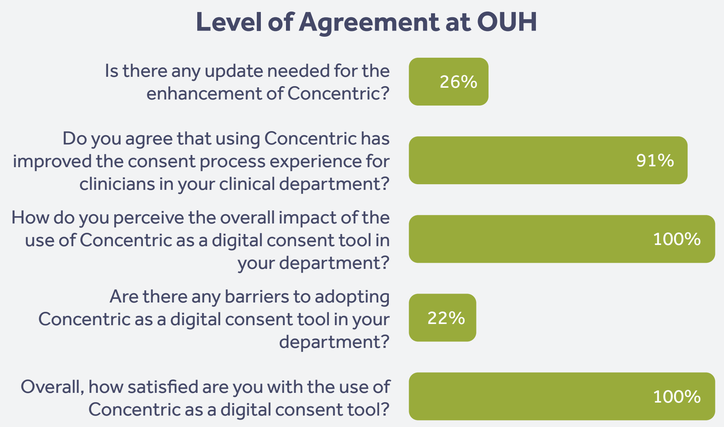

Figure 2: Level of Agreement Among OUH Staff on Concentric Digital Consent

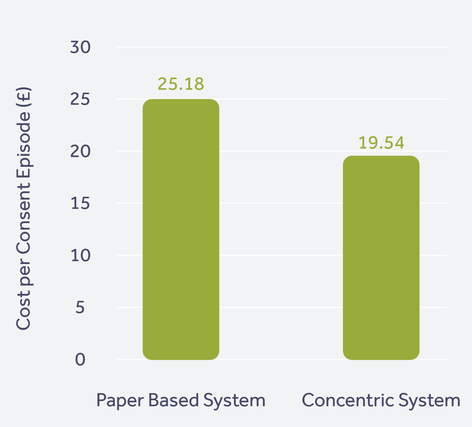

Figure 3: Cost Per Consent Episode: Paper vs Concentric

Table 1: Key economic findings from the preliminary health economic analysis

Model Output	Per Consent Episode	8 Months	3 Years
Ongoing & implementation cost savings	£ 5.64	£ 37,209	£ 167,437
Missed consent forms	£25.18	£3,222.49	£14,501.19
Day-of-Surgery delays (theatre-based)	£11.41	£125.51	£547.88
Day-of-Surgery delays (Room injection treatments)	£21.93	£241.23	£1,052.64
Medicolegal claims	£25,000	£3,300,000	£14,850,000

Conclusion

The implementation of Concentric at OUH improved workflow efficiency, data integrity, and patient engagement. These operational gains translated into significant cost savings, eliminated consent-related cancellations, and mitigated medicolegal risks, reducing potential claims costs. Collectively, these benefits align with the NHS Long Term Plan to transition from analogue to digital systems, demonstrating Concentric's value in advancing digital maturity and operational efficiency across NHS settings.

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Lean Assessment Process Methodology for RMD-Health: Evaluating Clinical Need, Usefulness, Adoption Barriers, and Early Economic Value of AI in NHS Rheumatology Referrals

Aims & Objectives

To evaluate the clinical need, perceived usefulness, and potential adoption barriers of RMD-Health, a machine learning-based risk stratification tool designed to differentiate between inflammatory arthritis (IA) and non-inflammatory conditions (NICs) at the point of referral, using the Lean Assessment Process (LAP) methodology.

Methods

The LAP is a structured, resource-efficient framework developed to support early-stage health technology development by aligning evidence generation with stakeholder needs and system priorities. It incorporates human factor tools and stakeholder engagement to identify unmet clinical needs, assess value propositions, and anticipate implementation challenges. The LAP enables rapid, iterative feedback to inform product design, trial planning, and serves as a precursor to early economic modelling. Semi-structured interviews were conducted with NHS clinicians, including GPs, rheumatology consultants, and registrars, across multiple Trusts in England. Thematic analysis was employed to extract insights into clinical utility, feasibility of integration, and evidence requirements. Quantitative data on perceived usefulness and stakeholder influence were also collected using validated tools embedded within the LAP framework. Figure 1 illustrates the flow of the LAP methodology implemented for evaluating RMD-Health.

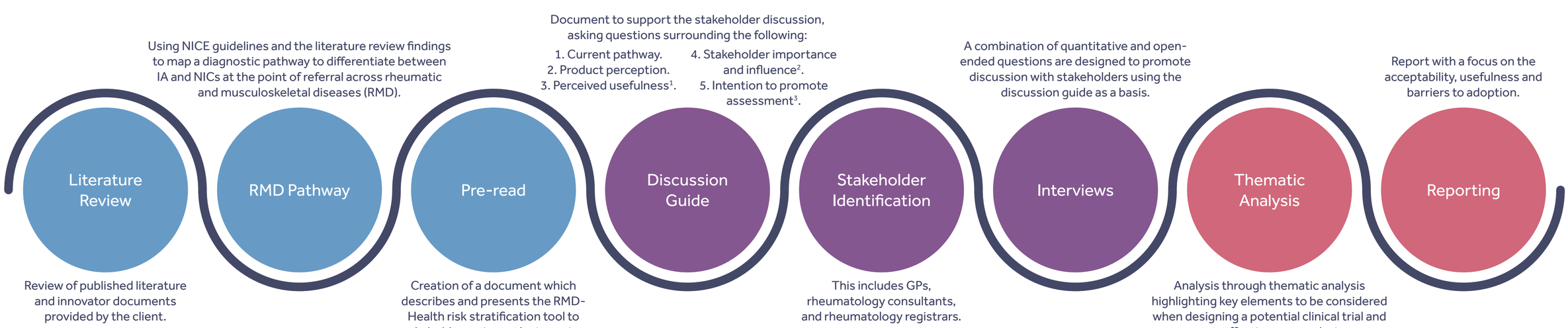

Figure 1: LAP for RMD-Health risk stratification tool.

Results

The study showed that stakeholders were positive about the potential usefulness of RMD-Health, with key benefits including the improvement in the quality and timeliness of referrals, better triaging processes and appropriate healthcare resource utilisation. Conversely, barriers to adoption were highlighted, such as the potential increase in workload for clinicians and the reliability of the outputs was questioned. Stakeholders emphasised the importance of real-world evidence to validate diagnostic accuracy, cost-effectiveness, and usability across diverse NHS settings. The diagrams demonstrate some of the quantitative results provided by the LAP by showing the level of agreement between stakeholders on individual perspectives (Figure 2); the perceived usefulness of the tool across stakeholders (Figure 3) and the intention to promote amongst the stakeholders (Figure 4).

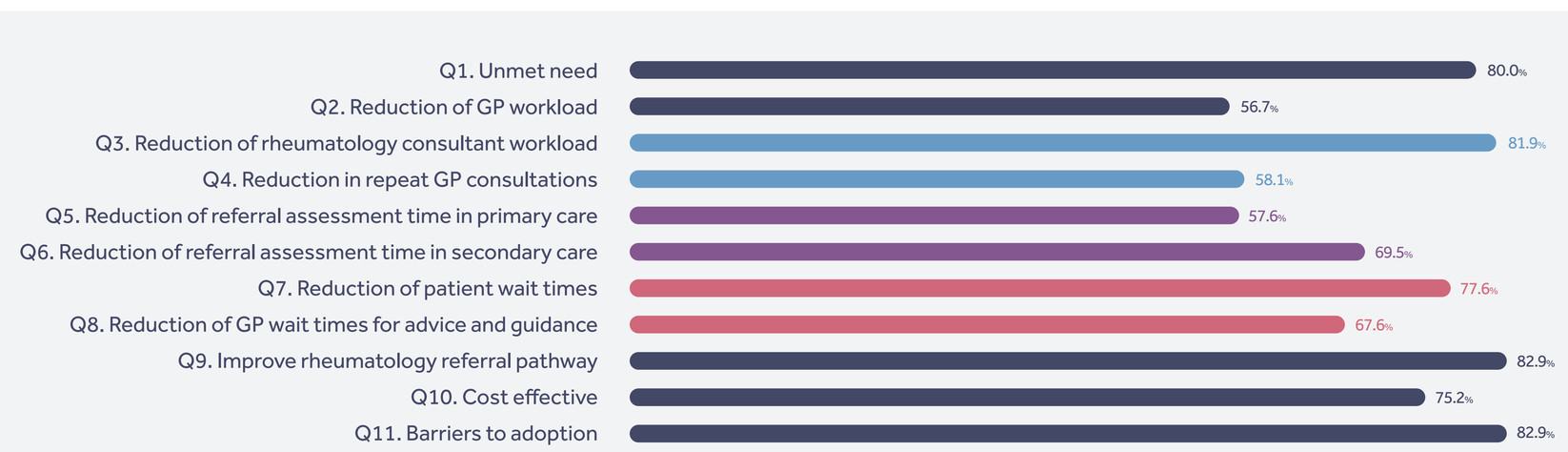

Figure 2: Individual Perspective showing the level of agreement between stakeholders

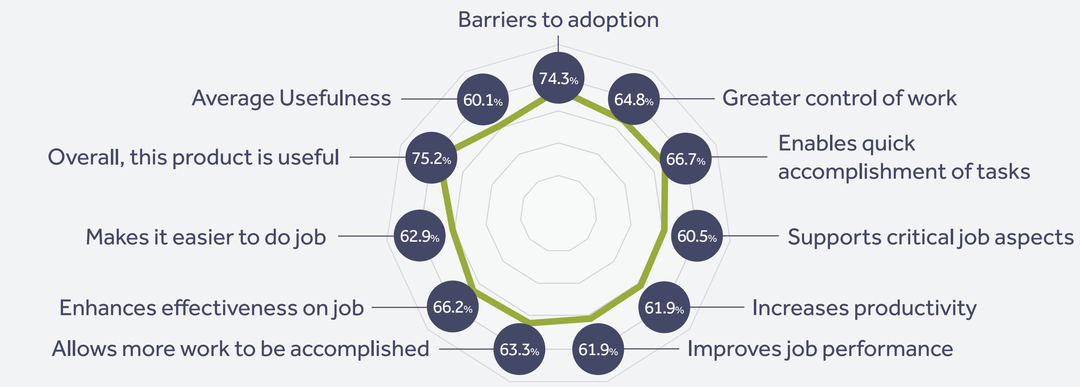

Figure 3: Perceived Usefulness tool showing the stakeholders' view on the usefulness of the technology

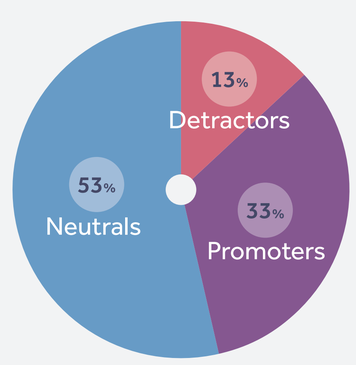

Figure 4: Stakeholders' intention to promote the technology

Conclusion

The LAP methodology provided a structured, stakeholder-informed approach to evaluating RMD-Health's clinical and operational value. Findings support the generation of further evidence, including pilot studies and economic evaluations, to inform NHS commissioning decisions and facilitate adoption into routine care. As a flexible and scalable framework, the LAP proved effective in aligning early evidence generation with real-world clinical priorities and system-level decision-making.

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EE558

Integrating Stakeholder Willingness-to-Pay Using the Van Westendorp Price Sensitivity Meter into Cost-Effectiveness Analysis: A Mixed-Methods Pricing Framework

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Introduction

Adoption of digital health technologies in the NHS depends not only on clinical evidence but also on economic feasibility, typically assessed against willingness-to-pay (WTP) thresholds. However, conventional cost-effectiveness analyses often lack direct integration of stakeholder perspectives on value and affordability.

Aims

To explore NHS stakeholder perspectives on willingness-to-pay and quantitatively translate these into structured price thresholds, operationalised within cost-effectiveness modelling to inform value-based adoption.

Objectives

- Explore NHS stakeholder perspectives on acceptability, perceived value, and pricing expectations.
- Derive stakeholder-informed WTP thresholds using the Van Westendorp Price Sensitivity Meter.[1,2]
- Quantitatively integrate WTP thresholds into decision-analytic cost-effectiveness models to evaluate economic feasibility.
- Assess cost-effectiveness across varying pricing and diagnostic performance scenarios using ICER and NMB metrics.
- Provide a mixed-methods framework to align pricing decisions with NHS procurement priorities and value-based adoption.

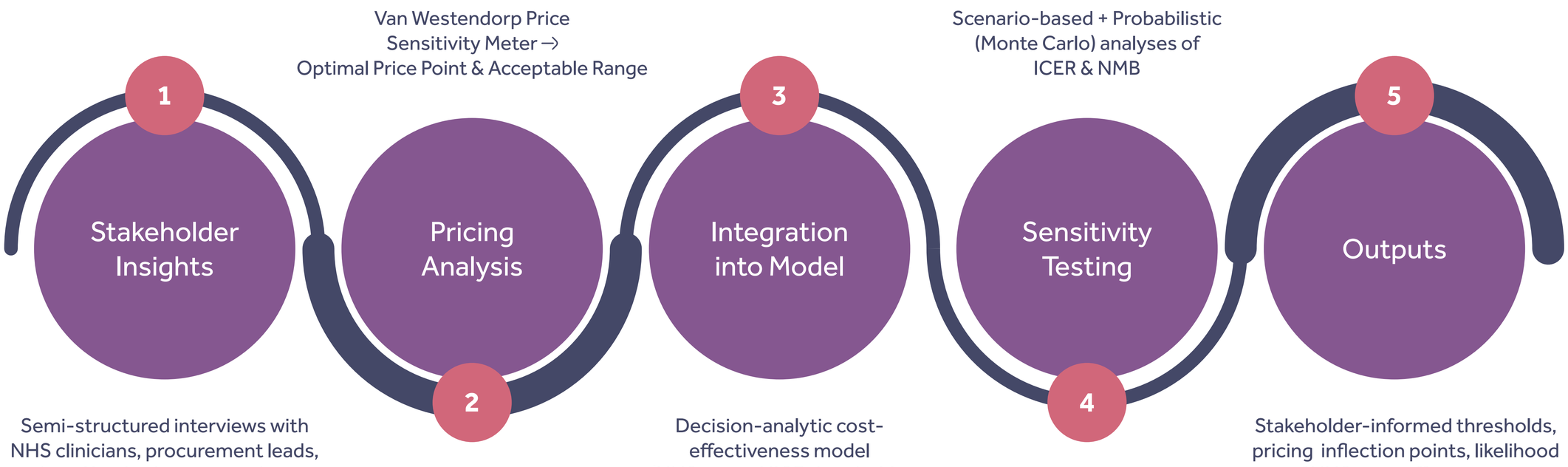
Methods

- **Qualitative strand:** Semi-structured interviews with NHS clinicians, procurement leads, digital leads, and regional decision-makers to elicit perspectives on value and affordability.
- **Quantitative strand:** Application of the **Van Westendorp Price Sensitivity Meter** to quantitatively estimate price thresholds.
- **Economic modelling:** Thresholds incorporated into a decision-analytic cost-effectiveness model developed and reported in line with international standards for health economic evaluation (CHEERS 2022).[3] Model inputs—including unit costs, clinical probabilities, and outcome estimates—were based on NHS reference costs, NICE guidance, and published literature.
- **Analyses:** Scenario-based and probabilistic sensitivity analyses (Monte Carlo) to test robustness of cost-effectiveness outcomes.

Findings

- **Stakeholder-informed thresholds:** Identified clear optimal and acceptable price ranges that reflected perceived value and affordability.
- **Integration into modelling:** Thresholds were operationalised within cost-effectiveness analysis, influencing incremental cost-effectiveness ratios (ICERs) and net monetary benefit (NMB).
- **Sensitivity analyses:** Demonstrated how variations in price and performance shaped the likelihood of cost-effectiveness under NHS-relevant conditions.
- **Pricing inflection points:** Highlighted thresholds that determined the likelihood of cost-effectiveness across scenarios.
- **Methodological contribution:** Validated the feasibility of embedding stakeholder-derived parameters directly into early-stage economic evaluation.

Mixed-Method Pricing Framework



Conclusion

This study demonstrates a methodological approach to embedding stakeholder-informed WTP thresholds, derived via qualitative interviews and Van Westendorp analysis, into early-stage cost-effectiveness modelling. The framework enables NHS decision-makers to assess affordability and value alignment, supporting strategic procurement and adoption of digital health technologies.

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Evaluating an Augmented Reality Software for Mechanical Thrombectomy Using the Lean Assessment Process Methodology: Identifying Clinical Needs, Stakeholder Acceptance and Adoption Barriers in the NHS

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Introduction

The LAP methodology provides a structured framework that integrates qualitative and quantitative insights with human factors and health economics to support early-stage health technology development. LAP helps innovators understand NHS requirements and stakeholder expectations, guiding decisions around product refinement, commercialisation, and adoption pathways. In this study, LAP was used to assess the potential value of a real-time 3D augmented reality (AR) software designed to assist neuroradiologists during mechanical thrombectomy procedures.

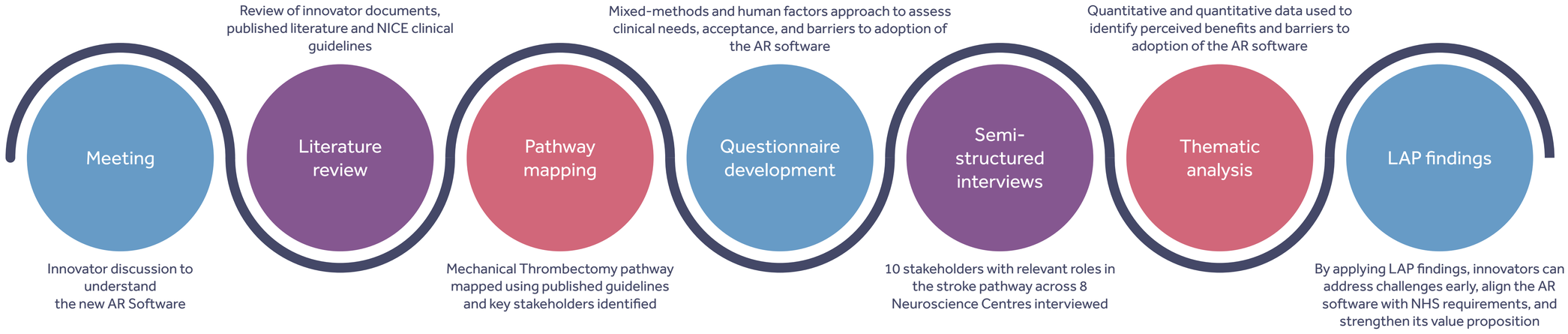
Objectives

The objectives of the feasibility study were to explore the clinical need, stakeholders' acceptance and potential barriers to adoption of a real-time augmented reality (AR) software designed to support clinicians during mechanical thrombectomy procedures in the NHS in England. The study applied the Lean Assessment Process (LAP) methodology to evaluate the software's value proposition early in its development.

Methods

The LAP methodology combines stakeholder engagement, pathway mapping, and thematic analysis to assess the clinical relevance and implementation potential of emerging technologies. The mechanical thrombectomy pathway was mapped using the National Institute for Health and Care Excellence (NICE) clinical guidelines[1]. Ten expert stakeholders including interventional neuroradiologists, trainees, clinical leads, and medical directors were recruited from eight NHS Neuroscience Centres across England. A questionnaire and semi-structured interviews were developed and used to capture stakeholders' perspectives on unmet clinical needs, perceived usefulness of the novel AR software, its level of acceptance, and potential barriers to its adoption. Interview transcripts were thematically analysed to extract actionable insights.

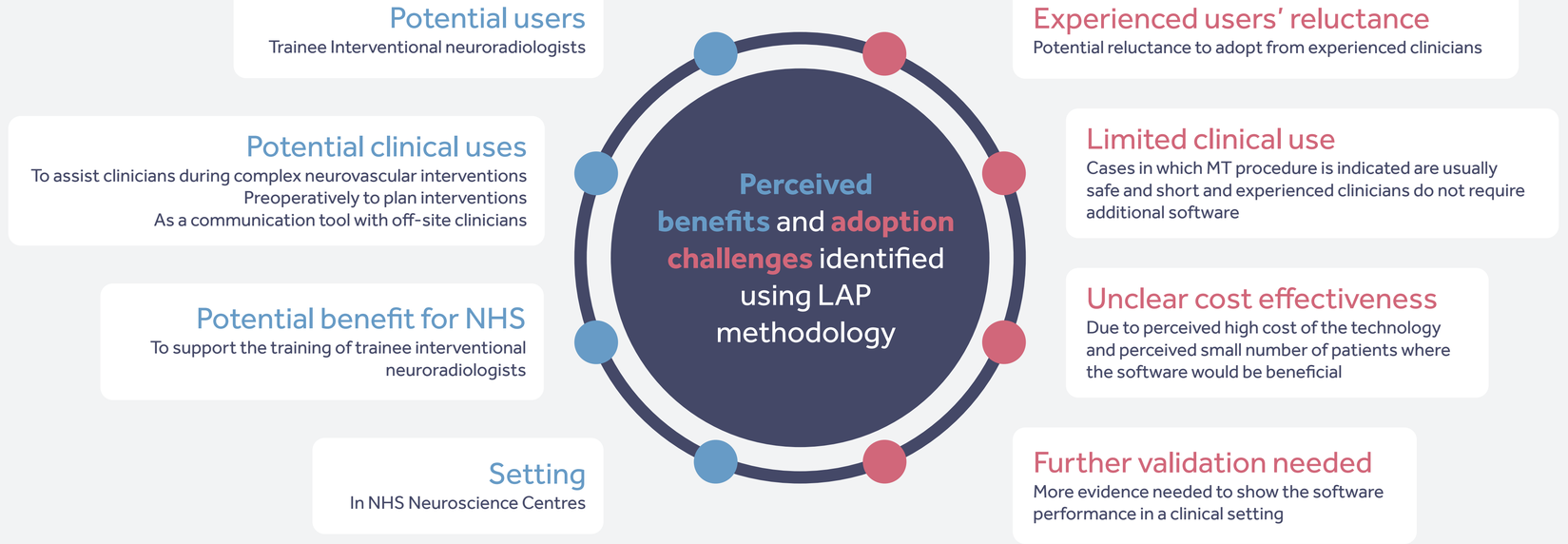
LAP methodology as an early Health Technology Assessment process to evaluate a novel Augmented Reality software in the NHS Mechanical Thrombectomy pathway



Results

Stakeholders expressed strong support for the 3D image analysis software, particularly as a training tool for early-career interventional neuroradiologists. The software received an overall usefulness score of 65.9, with 50% of stakeholders identifying as promoters. It was seen as valuable for enhancing confidence and skills in complex neurovascular cases, including distal occlusions, arteriovenous malformations (AVMs), and aneurysms. Key barriers to adoption included the need for integration into existing clinical workflows and further clinical validation to support routine use. The LAP study helped identify specific requirements for successful implementation and alignment with NHS care settings.

LAP methodology revealed stakeholder's perceived benefits and barriers to adopting new AR software in the NHS Mechanical Thrombectomy pathway



Conclusion

Using the LAP methodology, the value proposition of the 3D image analysis software was assessed and key elements to consider were identified. Based on the results of this study, a pilot study is currently taking place and will inform the future economic evaluation and adoption strategies.

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Early Economic Modelling of Mutant TNF (mutTNF) as a BBB-Permeabilising Adjunct in Breast Cancer Brain Metastases (BCBM): A UK NHS Perspective

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Introduction

Brain metastases affect 20–40% of metastatic breast cancer patients, especially HER2-positive and triple-negative subtypes, with poor prognosis and limited CNS response to systemic therapy due to the blood–brain barrier (BBB).[1,2]

Mutant tumour necrosis factor (mutTNF), a TNFR1-selective biologic, transiently permeabilises the BBB at tumour sites, enhancing intracranial delivery of systemic agents in preclinical models.[3,4]

With GMP production underway and early clinical trials approaching, there is an urgent need for health economic evidence to assess mutTNF's value and inform NHS adoption, pricing, and reimbursement.

Aims

To evaluate the cost-effectiveness of standard treatment and management for breast cancer brain metastases (BCBM), with and without the addition of mutTNF.

Objectives

- Conduct a cost-effectiveness analysis comparing standard care with and without mutTNF, estimating incremental costs, quality-adjusted life-years (QALYs), the incremental cost-effectiveness ratio (ICER), and net monetary benefit (NMB).
- Provide a clinically and mechanistically coherent comparator framework.
- Undertake subgroup analyses.
- Perform scenario and threshold analyses.
- Implement probabilistic sensitivity analysis (PSA) to assess decision uncertainty.
- Generate recommendations to inform NHS integration, reimbursement, and policy.

Methods

Comparators

This evaluation directly compared two strategies:

- Standard care: the established treatment framework for patients with BCBM, including systemic therapy alone or in combination with surgery or radiotherapy.
- Standard care + mutTNF: the same framework, augmented with mutTNF

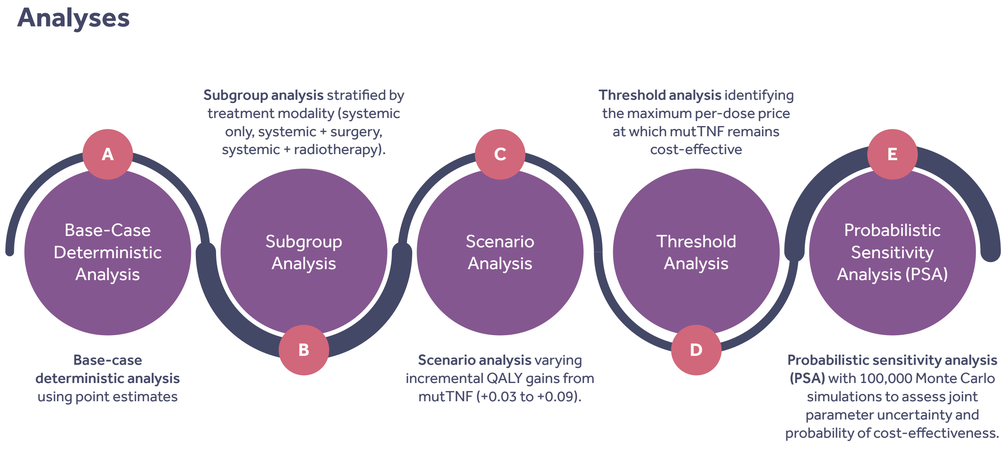
Perspective and Time Horizon

- UK NHS perspective
- 1-year horizon, aligned with BCBM clinical course and NICE early modelling guidance

Model Framework and Outcomes

- Decision-analytic model to estimate total costs and QALYs
- Outcomes: ICER and NMB at £30,000/QALY threshold

Analyses



Conclusion

mutTNF is likely to be a cost-effective adjunct to BCBM care, even under conservative assumptions. The findings offer strategic insights to inform value-based pricing, trial design, and early HTA engagement.

Results

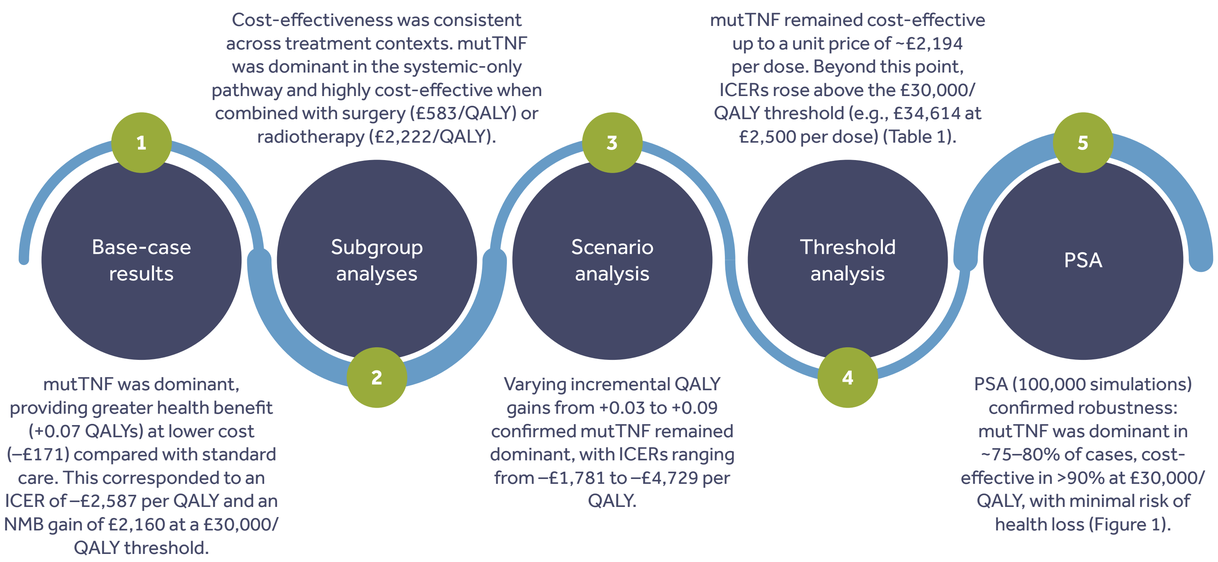


Table 1: Threshold Analysis: Cost-Effectiveness of mutTNF at Varying Unit Prices

Cost input - mutTNF (£)	Total Cost (£)	Incr. Cost (£)	Effectiveness (QALYs)	Incr. Effectiveness (QALYs)	ICER (£/QALY)	NMB (£)	C/E (£/QALY)
50	28333	-156	0.72	0.07	-2361	-6853	39571
100	28383	-106	0.72	0.07	-1607	-6903	39641
200	28483	-6	0.72	0.07	-97	-7003	39781
400	28683	194	0.72	0.07	2921	-7203	40060
600	28883	394	0.72	0.07	5939	-7403	40339
800	29083	594	0.72	0.07	8958	-7603	40619
1000	29283	794	0.72	0.07	11976	-7803	40898
1500	29783	1294	0.72	0.07	19522	-8303	41596
1532	**29814**	**1325**	**0.72**	**0.07**	**20000**	**-8335**	**41640**
1700	29983	1494	0.72	0.07	22541	-8503	41876
2000	30283	1794	0.72	0.07	27068	-8803	42295
2100	30383	1894	0.72	0.07	28578	-8903	42434
2194	**30477**	**1988**	**0.72**	**0.07**	**30000**	**-8997**	**42566**
2200	30483	1994	0.72	0.07	30087	-9003	42574
2500	30783	2294	0.72	0.07	34614	-9303	42993
3500	31783	3294	0.72	0.07	49707	-10303	44390
5000	33283	4794	0.72	0.07	72345	-11803	46485

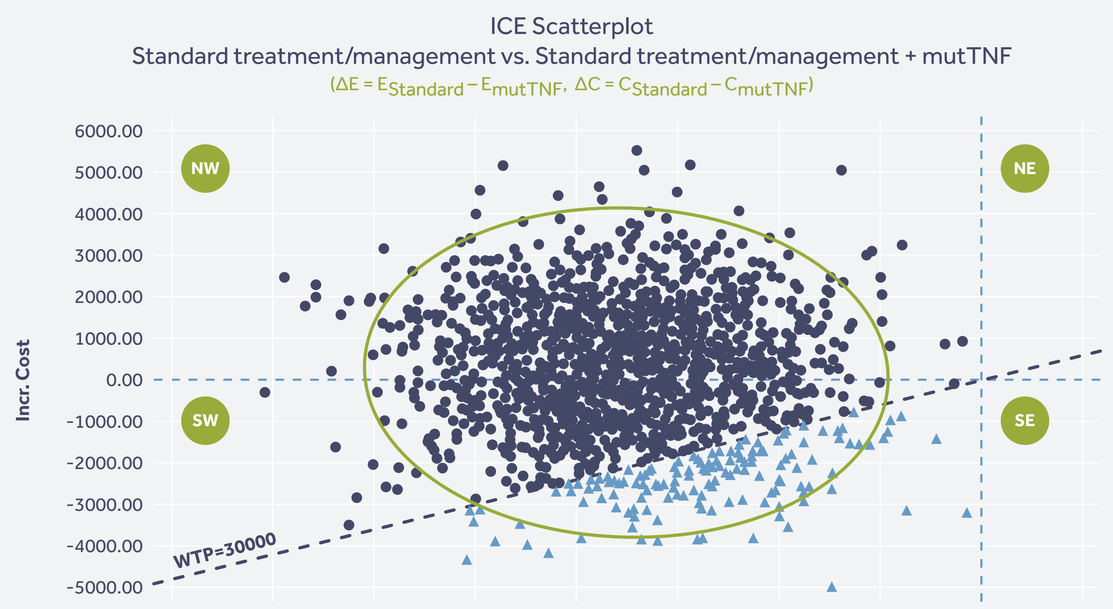


Figure 1: Incremental-cost-effectiveness (ICE) scatterplot

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