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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

Serres F[1], Pratt P[2], Waller R[2], Lobotesis K[2], Johnson C[2], Edwards E[2], Rose J[1], Bajre M[1]

1 Health Innovation Oxford and Thames Valley; 2 Medical iSight (UK) Limited

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.

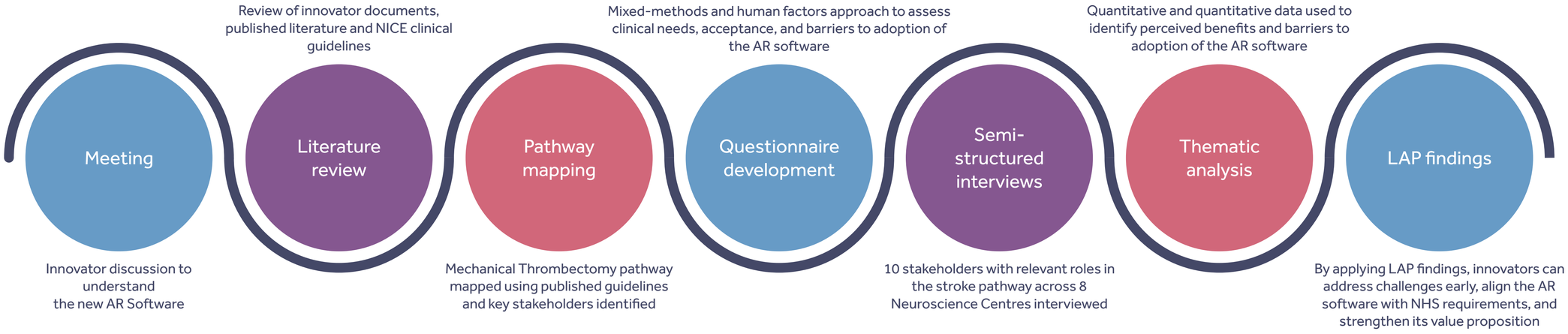
Objectives

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.

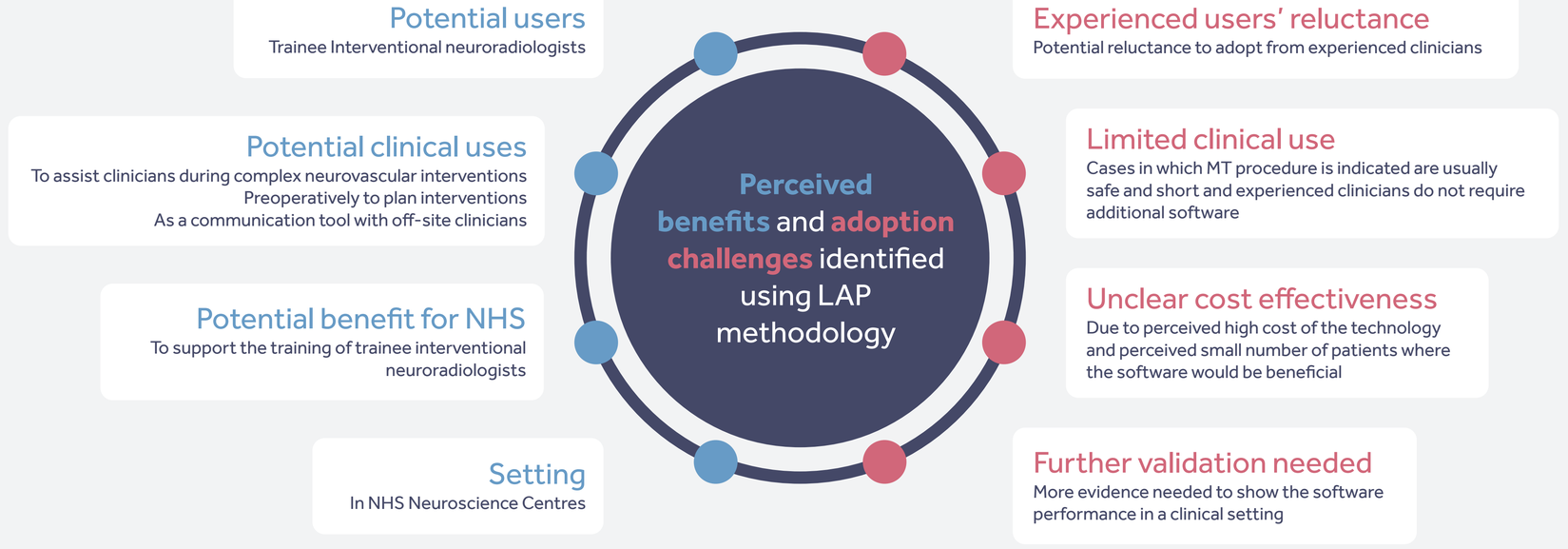
LAP methodology as an early Health Technology Assessment process to evaluate a novel Augmented Reality software in the NHS Mechanical Thrombectomy pathway



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.

References

National Institute for Health and Care Excellence. NICE Guideline [NG128] Stroke and transient ischemic attack in over 16s: diagnosis and initial management. Last update:13 April 2022.

Dr Florence Serres
florence.serres@healthinnovationoxford.org

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