

Configuring AI-Powered Retinal Biomarkers into Actionable Care: A Multi-Stage Service Design Study for Early Risk Detection of Cognitive Decline

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The **clinical value** of **retinal biomarkers** depends on how risk information is configured into services, workflows, and clinical decision-making. Key elements of **service design** include **longitudinal monitoring**, **early actionability** on **modifiable risk factors**, **pathways augmentation**, and **decision-making support**. Implementation is **system-level** rather than setting-level.

INTRODUCTION

METHODS

RESULTS

CONCLUSIONS

REFERENCES

Early risk information has the potential to transform the way cognitive decline is managed. AI analysis of retinal imaging is emerging as a promising biomarker for identifying risk of cognitive decline. However, substantial service design is required to translate these technologies into actionable care and benefits realisation. Retinal Biomarker + Service Design → Value	Longitudinal multi-stage qualitative service design research with stakeholders across Alzheimer’s pathways +60 in-depth interviews - Workshop 1 Exploration interviews New Service Design shapes further stages General conditions of landscape 2 Co-Design workshops Potential alternatives and pathways 3 Preferred Service Model Convergence + feasible design 4 Refinement interviews Value Proposition and benefits realisation	Three Integration Service Models (within current pathways) 1. Primary Care Triage Support - Referral prioritisation - GP decision support - Earlier specialist assessment 2. Optometry-led Early Detection & Longitudinal Monitoring - Routine eye examinations - Serial risk assessment - Community-based monitoring 3. Augmentation of Diagnostic Pathways - Additional risk information - Memory clinic support - Multimodal assessment
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1. Preventive Brain Health Monitoring

- Risk communication
- Lifestyle interventions
- Management of modifiable risk factors

2. Prognostic Risk Stratification

- Clinical trial recruitment
- Treatment eligibility
- Personalised follow-up

3. Risk-informed Care Pathway Support

- Tailored care pathways
- Coordinated follow-up
- Targeted resource allocation