



Kent Academic Repository

Rice, Rachel, Shepherd, Ursula, Dikomitis, Lisa, Harper, Jamie, Shergill, Sukhi S. and Rodda, Joanne (2025) *The potential of ultra-low field magnetic resonance imaging, within dementia diagnosis pathways in the United Kingdom*. *The British Journal of Psychiatry*, 228 (4). pp. 375-376. ISSN 0007-1250.

Downloaded from

<https://kar.kent.ac.uk/114088/> The University of Kent's Academic Repository KAR

The version of record is available from

<https://doi.org/10.1192/bjp.2025.10429>

This document version

Publisher pdf

DOI for this version

Licence for this version

UNSPECIFIED

Additional information

Versions of research works

Versions of Record

If this version is the version of record, it is the same as the published version available on the publisher's web site. Cite as the published version.

Author Accepted Manuscripts

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding. Cite as Surname, Initial. (Year) 'Title of article'. To be published in **Title of Journal**, Volume and issue numbers [peer-reviewed accepted version]. Available at: DOI or URL (Accessed: date).

Enquiries

If you have questions about this document contact ResearchSupport@kent.ac.uk. Please include the URL of the record in KAR. If you believe that your, or a third party's rights have been compromised through this document please see our [Take Down policy](https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies) (available from <https://www.kent.ac.uk/guides/kar-the-kent-academic-repository#policies>).

Letter

The potential of ultra-low field magnetic resonance imaging, within dementia diagnosis pathways in the United Kingdom

Rachel Rice, Ursula Shepherd, Lisa Dikomitis, Jamie Harper, Sukhi Shergill and Joanne Rodda

Keywords

Dementia diagnostic pathway; neuroimaging; ULF-MRI.

Copyright and usage

© The Author(s), 2025. Published by Cambridge University Press on behalf of Royal College of Psychiatrists.

Neuroimaging bottlenecks are a well-established cause of delays in dementia assessment across the UK.¹ Ultra-low field magnetic resonance imaging (ULF-MRI) has the potential to radically change how neuroimaging is used in the assessment of dementia. ULF-MRI scanners use a fraction of the magnetic field strength of standard MRI scanners and do not require expensive cooling or shielding. They also cost a fraction of standard scanners to buy and maintain, are small and robust enough to be used in community clinics, and do not require specialist operators.² A growing body of evidence has described strong correlations between ULF and standard MRI on key measures relevant to dementia diagnosis, including regional atrophy and white matter changes.³ The potential for synergy with other technological advancements was demonstrated by Deoni et al. (2023), who fitted an ULF-MRI scanner in a Ford Transit van for a community study that combined mobile neuroimaging with web-based remote cognitive assessment.⁴

Despite the importance of timely dementia diagnosis, many people currently experience long waits for assessment and diagnosis. Neuroimaging usually takes place in general hospitals away from community-based memory clinics, and access for people in rural or coastal areas is often compromised through limited transport connections.⁵ Through increasing capacity and providing point-of-care neuroimaging in the community, ULF-MRI has the potential to reduce inequalities and time to diagnosis, and improve patient experience.

With the aim of contributing to an emerging evidence base with data on the perspectives of people with lived experience of dementia regarding the use of ULF-MRI scanning within dementia assessment and research, we conducted a series of community focus groups and interviews with people living with dementia and carers. We recruited participants through robust engagement with local voluntary organisations. From this, a snowballing method was employed,⁶ whereby organisations helped to further identify participants who were members of such groups. Our sample included participants from coastal, rural and urban communities in Kent. A broad topic guide was used and written informed consent was obtained before commencing interviews and focus groups, which were recorded and transcribed and data were analysed through thematic analysis.

Focus groups and interviews took place between February and June 2024. 35 participants (24 female, 11 male, mean age 72 (range 22–88) took part in focus groups ($n = 20$) or interviews ($n = 15$). 12 participants were people with dementia and 23 were carers.

We identified five main themes: access to local neuroimaging, improvement of assessment pathways, accuracy of ULF-MRI, concerns about cost and diagnostic quality, and engagement in future ULF-MRI research.

The overall response to the idea of using ULF-MRI in dementia assessment and research was positive, in particular the idea of community-based imaging.

'I think a local [scan] would have been a lot easier to deal with.' (P12)

'A lot of people in the group don't drive' (P34)

Participants felt ULF-MRI had the potential to improve diagnostic pathways and reduce waiting times:

'Anything you can do is going to be an advantage to speed up that process.' (P24)

Participants were excited about the potential of ULF-MRI, and there was widespread willingness to engage in future research:

'We're quite happy to do that. It's going to help people win from it.' (P30)

'It won't affect us, but it will affect our grandchildren. And that's a good thing.' (P29)

Participants were concerned that ULF-MRI could be used as a way to cut costs at the expense of quality:

'Is it another way of how we can cut back on the costs of anybody going for a proper scan?' (P1)

Concerns around the accuracy of ULF-MRI scanning and its diagnostic value in rare types of dementia were also expressed:

'It depends how good they were, doesn't it really? Having a detailed scan is really important.' (P32)

Participants were concerned that if ULF-MRI did not provide sufficiently detailed information, some people may still need further neuroimaging. This was generally considered to be acceptable as long as patients could access the investigations required.

'Once you've had [a scan] and [been told] ... you'd benefit from having a more detailed one, I would accept that. Because they're in the process and they're on the pathway.' (P17)

Many participants were from coastal and rural communities. Therefore, it is not a surprise that they supported the idea of

locally-available neuroimaging. In areas with reduced public transport links, access to healthcare is also reduced, thus restricting access to diagnosis.⁵ Dementia diagnosis rates in rural and coastal areas are far lower than the national target of 66.7%.⁷ ULF-MRI offers the opportunity to deliver point of care neuroimaging,⁸ and thus to reduce inequalities in access to imaging and timely diagnosis and care in underserved communities.

ULF-MRI scanners cost a fraction of traditional MRI scanners to buy and maintain.⁹ Based on the views expressed by participants, it will be important to share clear information regarding the uses and limitations of ULF-MRI, such that community members are confident that it is used appropriately to aid diagnosis, and not to reduce costs at the expense of diagnostic accuracy. Ongoing research will establish more about the clinical utility of ULF-MRI in dementia assessment, and patients and the public need easily accessible information regarding the outcomes of these studies.

In conclusion, people with lived experience of dementia were optimistic about the potential of ULF-MRI, in particular the possibility of speedy access to neuroimaging in the local community. There was recognition that the technology would not replace existing neuroimaging methods, but very positive discussions about the possibility that ULF-MRI could improve dementia diagnosis pathways and waiting times, and reduce inequalities. It will be important to recognise and address the concerns highlighted regarding appropriate use of this new technology, and its diagnostic value. There is a growing body of evidence that ULF-MRI can meaningfully transform dementia diagnosis pathways; for this to have maximum impact, we must ensure that patients and the public are an integral part of the development of this work.

Rachel Rice , Kent & Medway NHS & Social Care Partnership Trust, St Martin's Hospital, Canterbury, UK; **Ursula Shepherd**, SCCJR, The University of Glasgow, Glasgow, UK; **Lisa Dikomitis**, Warwick Medical School, University of Warwick, Coventry, UK; **Jamie Harper**, Kent & Medway NHS & Social Care Partnership Trust, St Martin's Hospital, Canterbury, UK; **Sukhi Shergill**, Kent & Medway NHS & Social Care Partnership Trust, St Martin's Hospital, Canterbury, UK; and Kent and Medway Medical School, University of Kent, Canterbury, UK; **Joanne Rodda** , Kent & Medway NHS & Social Care Partnership Trust, St Martin's Hospital, Canterbury, UK; and Kent and Medway Medical School, University of Kent, Canterbury, UK

Correspondence: Joanne Rodda. Email: joanne.rodde@kmms.ac.uk

First received 23 Jul 2025, final revision 24 Jul 2025, accepted 25 Aug 2025

Author contributions

R.R. conducted focus groups and qualitative interviews, analysed qualitative data and drafted the manuscript. U.S. contributed to study design, conducted focus groups and interviews and contributed to analysis and manuscript. J.H. co-facilitated focus groups and contributed to data analysis and manuscript. L.D. contributed to conceptualisation, application for funding, data analysis and editing the final manuscript. S.S. contributed to conceptualisation of the study, successfully applied for funding and edited final manuscript. J.R. provided oversight to all aspects of the study, conceptualised and successfully applied for funding, supervised data collection and contributed to data analysis and editing of the manuscript.

Funding

This work was funded by a grant from the Kent, Surrey and Sussex National Institute for Healthcare Research Clinical Research Network.

Declaration of interest

S.S. and J.R. are members of the editorial board of the British Journal of Psychiatrists. Neither took part in the review or decision-making process of this paper.

References

- Nicholls D, Quirk A, Corrado O, Swanson B, Hood C, Essel R, et al. National Audit of Dementia 2023/24. Spotlight Audit in Memory Assessment Services National Report. Royal College of Psychiatrist ([https://www.rcpsych.ac.uk/docs/default-source/improving-care/ccqi/national-clinical-audits/national-audit-of-dementia/nad-round-6-\(2023-2024\)/mas-r6/nad-mas-2023-national-report-05082024-final.pdf?sfvrsn=660f4a40_5](https://www.rcpsych.ac.uk/docs/default-source/improving-care/ccqi/national-clinical-audits/national-audit-of-dementia/nad-round-6-(2023-2024)/mas-r6/nad-mas-2023-national-report-05082024-final.pdf?sfvrsn=660f4a40_5) [cited 10 Nov 2024]).
- Kimberly WT, Sorby-Adams AJ, Webb AG, Wu EX, Beekman R, Bowry R, et al. Brain imaging with portable low-field MRI. *Nat Rev Bioeng* 2023; **1**: 617–30.
- Sorby-Adams AJ, Guo J, Laso P, Kirsch JE, Zabinska J, Garcia Guarniz AL, et al. Portable, low-field magnetic resonance imaging for evaluation of Alzheimer's disease. *Nat Commun* 2024; **15**: 10488.
- Deoni SCL, Medeiros P, Deoni AT, Burton P, Beauchemin J, D'Sa V, et al. Development of a mobile low-field MRI scanner. *Sci Rep* 2022; **12**: 5690.
- All Party Parliamentary Group on Dementia 2023. Raising the Barriers: An Action Plan to Tackle Regional Variation in Dementia Diagnosis in England, 2023 (<https://www.alzheimers.org.uk/sites/default/files/2023-10/Raising%20the%20Barriers.pdf> [accessed 9 Sep 2024]).
- Bowling A. *Research Methods in Health: Investigating Health and Health Services*. McGraw-Hill Education, 2014.
- NHS England Digital. Primary Care Dementia Data, 2024 (<https://digital.nhs.uk/data-and-information/publications/statistical/primary-care-dementia-data/july-2024>).
- Wald LL, McDaniel PC, Witzel T, Stockmann JP, Cooley CZ. Low-cost and portable MRI. *J Magn Reson Imag* 2020; **52**: 686–96.
- Altaf A, Shakir M, Irshad HA, Atif S, Kumari U, Islam O, et al. Applications, limitations and advancements of ultra-low-field magnetic resonance imaging: a scoping review. *Surg Neurol Int* 2024; **15**: 218.