

Research Communication

Certification in reporting multiparametric magnetic resonance imaging of the prostate: recommendations of a UK consensus meeting

Multiparametric MRI (mpMRI) of the prostate is now recommended as the initial investigation method for men with suspected prostate cancer within both UK and international guidelines. Potential benefits of this pathway include: (i) reductions in the number of men requiring biopsy; (ii) reductions in the diagnoses of indolent cancers unlikely to cause harm, minimising treatment-related complications; (iii) improved detection of clinically significant prostate cancers, particularly for patients with prior negative systematic biopsy; and (iv) improved risk-stratification of diagnosed cancers owing to greater precision in tumour grade and volume determinations.

Successful delivery of the MRI-directed pathway requires imaging to be performed and reported to a sufficiently high standard [1,2]. The test is increasingly being used to ‘screen’ patients to avoid biopsy, emphasising the need for accurate interpretation. To ensure the utility of prostate MRI, and notably, that the high negative predictive value is preserved with widening uptake, there is a responsibility on UK practitioners that the roll-out is not at the cost of impaired quality in MRI acquisitions and/or reporting. Given the high disease prevalence, image acquisition and reporting cannot be the sole preserve of tertiary referral hospitals. The Prostate Imaging-Reporting and Data System (PI-RADS) guidelines have set minimal technical standards for MR image acquisition [3]; however, consensus is lacking on the experience levels required to independently report prostate MRI, or indeed, how reporter competence can be ensured. A panel of UK experts in the field of MRI and/or prostate cancer management was convened to address the perceived need for credentialing in prostate mpMRI interpretation for primary diagnosis and to identify the components of such a process.

A list of 13 UK panellists participated in the consensus meeting, encompassing 11 separate NHS centres, with representations from Scotland, Wales, and eight cancer alliances within England. An independent chair moderated the process, which followed the University of California at Los Angeles (UCLA)-Research and Development Corporation (RAND) appropriateness method (Data S1). In all, 211 statements related to oversight, applicant, validity period, and

certification elements were rated for agreement on a 9-point scale. For a statement to reach ‘consensus’, a panel majority score was required. Agreement for a statement was calculated using the median score from all panellists, mirroring previous work [4]. A median score of 1–3 indicated ‘disagreement’ with a statement, 4–6 ‘uncertainty’, and 7–9 ‘agreement’.

Consensus was reached in 141/211 questions (67%); including for 43/55 stem items (Data S2–S3). The panel agreed that there was a need for an evaluation process relating to the interpretation of prostate mpMRI performed in men with suspect prostate cancers and that this should be termed ‘certification’. This process should be performed at an individual level, and there should be a re-evaluation after a specified time (Data S4). Three certification levels were agreed; Level 1 expectations are to have a working knowledge of the methods and diagnostic utility of MRI. It was agreed that Level 1 should be open to consultants and speciality registrars/trainees in Radiology, Urology or Oncology, and also to radiographers and medical physicists. Level 2 is the threshold for independent reporting of MRI; it was agreed that Level 2 should be available to speciality registrars/trainees and consultants in radiology; however, other applicants may be considered on an individual basis in exceptional circumstances. Level 3 incorporates additional teaching and/or research experience and is appropriate for those running prostate MRI diagnostic services; it was agreed that this should only be available to consultants in radiology. Consensus was reached that attendance of at least one prostate MRI course in the preceding 3 years was mandatory at all levels, along with a variable number of continuing professional development (CPD) credits, attendance at prostate multidisciplinary team (MDT) meetings, and for a logbook of cases depending on the level of certification. An examination was only felt to be appropriate for entry to Level 2 certification, and that Level 3 entry required additional demonstration of teaching and/or research experience (Table 1). The format of an examination is yet to be determined. Digital quality assurance systems that incorporate online case-based examinations are ideally suited for this purpose, but in the shorter term, written and image-based multiple choice questions examination are more likely to be used. CPD credits can be obtained from any national or international organisations and have to be prostate related, but not specifically limited to diagnostic prostate MRI.

[The copyright line for this article was changed on 04 December 2020 after original online publication]

Table 1 Summary of recommendations by certification level.

Items	Level 1	Level 2	Level 3
Who can apply	Consultants or SpRs in Diagnostic Radiology, Urology and Oncology, Diagnostic Radiographers and MRI physicists	SpRs in Radiology Consultants in Radiology*	Consultants in Radiology
Requires working knowledge of MRI methods/utility	Yes	Yes	Yes
Able to independently report prostate MRI	No	Yes	Yes
Can run a prostate MRI service	No	No	Yes
Demonstration of research/teaching activity	No	No	Yes
Attendance at prostate MRI course in the last 3 years	Yes	Yes	Yes
Number of yearly MDT attendances	4/year (every 3 months)	12/year (every month)	12–21/year
Annual CPD credits [†]	10	20	20–30
Maximum % of self-directed CPD credits	25–50	≤50	25–75
Number of logbook cases required [‡]	20	100	100
Maximum % of logbook cases from workshops	Up to 50	10–25	10–50
Examination required	No	Yes	No
Term	3 years	3 years	3 years

Green = consensus agreement; orange = consensus achieved for a range of values; red = highest agreement scoring item is listed, with no consensus achieved. *Other applicants may be considered in exceptional circumstances. [†]CPD credits can be from any national or international organisation, but must be prostate-related. [‡]Should comprise ≥75% biopsy naïve cases and ≥50% DCE studies. SpRs, specialist Registrars (trainees) within speciality.

Consensus was not achieved for the exact number of logbook cases required at any level; however, it was agreed that the logbook case mix should include ≥75% biopsy naïve and/or prior negative biopsy cases and ≥50% dynamic contrast-enhanced (DCE mpMRI) studies. There was consensus that applications should be assessed by an administrator followed by two panel members, and only requires review by the certification lead in cases of arbitration.

This process complements the European Society of Urogenital Radiology (ESUR)/European Association of Urology Section of Urologic Imaging (ESUI) consensus paper on MRI acquisition, interpretation, and training and provides more explicit detail on how interpretation standards should be met [5]. It is hoped that the three tiers of expertise proposed will help deliver in-breadth and in-depth the potential benefits of the pre-biopsy prostate MRI pathway [4]. The authors wish to stress that non-certification does not imply unsatisfactory MRI practice. Likewise, ‘certification’ does not hold any official or regulatory status and will be voluntary. The central purpose of the certification process will be to offer individuals a kite-mark of their MRI reporting quality demonstrating a minimum level of expertise has been obtained, which is comparable across similar practitioners in the UK, and providing supportive evidence within the UK framework of appraisal and re-validation. The expectation is that in seeking and obtaining certification, reporting quality will rise and over time ensure consistency and accuracy for the MRI pathway for suspected prostate cancer. The next steps in the process include developing administrative support towards a launch date, and the development of an online case repository that can potentially be used for training, logbook accrual, and examination purposes.

A key consideration in the certification process has been where to set competency bars for each level: too low, and the quality for service delivery is not attained or maintained; too high and the process may be seen as off-putting, limiting the available reporter pool at the time of increasing demand. Consensus was reached on several key components of the certification process including who can apply at different levels, prostate course attendance, MDT attendance, need for examination, the validity period, and, for Levels 1–2, the number of CPD credits required. A notable exception was the number of logbook cases required. This is an area of active debate in the literature, with evidence suggesting 200–300 cases should be reported in a real-world setting to achieve expertise [6,7], and 50–100 cases/year [4,5,8] to maintain competence.

A limitation of any consensus process is that the results only reflect the opinions of the panel and may be prone to biases, including potential for pre-selection bias in panel members invited to participate. Each panellist only had one vote, and an independent chair ensured balanced debates, with all viewpoints aired and without individual members dominating discussions. The number of panellists was relatively small; however, this was comparable to other UK and European consensus processes [4]. Furthermore, the inclusion of panellists from different specialities, working in different healthcare settings, and with a broad geographical spread, ensured that opinion was not based on a narrow scope of practice. Future work is required comparing reporters with certification vs those without to measure any potential improvements in patient-related outcomes.

In conclusion, consensus was reached on the need for credentialing in prostate-MRI reporting for directing biopsies, with criteria for three certification levels proposed. The





certification process should aid the uniform delivery of the MRI-directed pathway in men with suspected prostate cancer.

Acknowledgements

We are thankful to Prostate Cancer UK for their support of the meeting through travel organisation, hosting the meeting, and to Rebecca Leszczynski, Ellie Johnston, Thomas Harding, and Karen Stalbow for assistance, administrative support, and data processing. Prostate Cancer UK provided funding for travel and accommodation of panellists, and the venue for the meeting. T. Barrett receives research support from Cancer Research UK, NIHR Cambridge Biomedical Research Centre, and the EPSRC Imaging Centre in Cambridge and Manchester. H. Ahmed acknowledges funding support from Wellcome, Prostate Cancer UK, MRC, Cancer Research UK, BMA Foundation, The Urology Foundation, Sonacare, Galil/BTG, Sophiris. M-V. Papoutsaki was supported by the KCL/UCL Comprehensive Cancer Imaging Centre funding and the UCLH Biomedical Research Centre funding. J. Staffurth receives research support from Cancer Research UK, Health and Care Research Wales, NIHR and Cancer Research Wales.

Conflict of Interest

Dr. Ahmed reports grants, personal fees and other from Sonacare Inc, personal fees and other from Boston Scientific, grants and personal fees from Sophiris Bio, outside the submitted work. Dr. Staffurth reports personal fees and non-financial support from AstraZeneca, personal fees and non-financial support from Janssen, personal fees from Astellas, from null, outside the submitted work.

Tristan Barrett¹ , Anwar R. Padhani², Amit Patel³, Hashim U. Ahmed^{4,5} , Clare Allen⁶, Harry Bardgett⁷, Jane Belfield⁸, Mrishita Brizmohun Appayya⁶, Thomas Harding⁹, Ornella-Shanin Hoch⁹, Julian Y. Keanie¹⁰, Sidath H. Liyanage¹¹, Marianthi-Vasiliki Papoutsaki⁶, Shonit Punwani⁶ , Mark J.C. Robinson¹², Arumugam Rajesh¹³ , John N. Staffurth¹⁴, Jan van derMeulen¹⁵ and Jonathan Richenberg¹⁶

¹Department of Radiology, Addenbrooke's Hospital, University of Cambridge, Cambridge, ²Mount Vernon Cancer Centre, Paul Strickland Scanner Centre, Northwood, ³Department of Radiology, Lister Hospital, Stevenage, ⁴Imperial Prostate, Division of Surgery, Department of Surgery and Cancer, Faculty of Medicine, Imperial College London, London, ⁵Imperial Urology, Imperial College Healthcare NHS Trust, London, ⁶Centre for Medical Imaging, University College London, London, ⁷Western West Yorkshire Uro-Oncology Centre, Bradford Teaching Hospitals, Bradford, ⁸Royal Liverpool University Hospital, Liverpool, ⁹Prostate Cancer, London, ¹⁰Department of Radiology, Western General

Hospital, Edinburgh, ¹¹Department of Radiology, Southend University Hospital Prittlewell Chase, Essex, ¹²Department of Radiology, Royal Gwent Hospital, Newport, ¹³University Hospitals of Leicester NHS Trust, Leicester, ¹⁴Division of Cancer and Genetics, School of Medicine, Cardiff University, Cardiff, ¹⁵London School of Hygiene and Tropical Medicine, London and ¹⁶Royal Sussex County Hospital Brighton and Brighton and Sussex Medical School, Brighton, UK

References

- 1 Padhani AR, Barentsz J, Villeirs G et al. PI-RADS steering committee: the PI-RADS multiparametric MRI and MRI-directed biopsy pathway. *Radiology* 2019; 292: 464–74
- 2 Caglic I, Barrett T. Optimising prostate mpMRI: prepare for success. *Clin Radiol* 2019; 74: 831–40
- 3 Turkbey B, Rosenkrantz AB, Haider MA et al. Prostate imaging reporting and data system version 2.1: 2019 update of prostate imaging reporting and data system version 2. *Eur Urol* 2019; 2019: 340–51
- 4 Brizmohun Appayya M, Adshead J, Ahmed HU et al. National implementation of multi-parametric magnetic resonance imaging for prostate cancer detection - recommendations from a UK consensus meeting. *BJU Int* 2018; 122: 13–25
- 5 de Rooij M, Israël B, Tummers M et al. ESUR/ESUI consensus statements on multi-parametric MRI for the detection of clinically significant prostate cancer: quality requirements for image acquisition, interpretation and radiologists' training. *Eur Radiol.* 2020; 30: 5404–16
- 6 Gaziev G, Wadhwa K, Barrett T et al. Defining the learning curve for multiparametric magnetic resonance imaging (MRI) of the prostate using MRI-transrectal ultrasonography (TRUS) fusion-guided transperineal prostate biopsies as a validation tool. *BJU Int* 2016; 117: 80–6
- 7 Gatti M, Faletti R, Callaris G et al. Prostate cancer detection with biparametric magnetic resonance imaging (bpMRI) by readers with different experience: performance and comparison with multiparametric (mpMRI). *Abdom Radiol* 2019; 44: 1883–93
- 8 Puech P, Randazzo M, Ouzzane A et al. How are we going to train a generation of radiologists (and urologists) to read prostate MRI? *Curr Opin Urol* 2015; 25: 522–35

Correspondence: Tristan Barrett, Department of Radiology, Addenbrooke's Hospital and the University of Cambridge, Cambridge CB2 0QQ, UK.

e-mail: tristan.barrett@addenbrookes.nhs.uk

Abbreviations: CPD, continuing professional development; DCE, dynamic contrast-enhanced; MDT, multidisciplinary team; mpMRI, multiparametric MRI.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Data S1. Detailed methods.

Data S2. Number (%) of items reaching consensus in each section of the questionnaire.

Data S3. Agreement and consensus data for all items.

Data S4. Detailed results.