

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

Magnetic Resonance Imaging Screening for Prostate Cancer: Clinical Utility and Guidelines

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Research Questions

1. What is the clinical utility of magnetic resonance imaging screening for prostate cancer?
2. What are the evidence-based guidelines on the use of magnetic resonance imaging for prostate cancer screening?

Key Findings

One health technology assessment, one systematic review with meta-analysis, and one randomized controlled trial were identified regarding the clinical utility of magnetic resonance imaging screening for prostate cancer. In addition, nine evidence-based guidelines were identified regarding the use of magnetic resonance imaging for prostate cancer screening.

Methods

A limited literature search was conducted by an information specialist on key resources including Ovid Medline, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were prostate cancer and MRI. Search filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, or network meta-analyses, randomized controlled trials or controlled clinical trials or guidelines. Where possible, retrieval was limited to the human population. The search for health technology assessments, systematic reviews, meta-analyses, or network meta-analyses, randomized controlled trials or controlled clinical trials was also limited to English language documents published between January 1, 2017 and October 9, 2019. The search for guidelines was limited to English language document published between January 1, 2014 and October 9, 2019. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Q1,2: Asymptomatic people or individuals at risk of prostate cancer
Intervention	Q1,2: Magnetic resonance imaging of the prostate, with or without additional screening methods (e.g., digital rectal examination)
Comparator	Q1: No screening, or usual care Q2: Not applicable
Outcomes	Q1: Clinical utility (e.g., morbidity and mortality, false positives, false negatives, unnecessary treatment, physical harms [e.g., adverse events, complications], psychological harms) Q2: Guidelines
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and evidence-based guidelines.

One health technology assessment¹, one systematic review with meta-analysis² and one randomized controlled trial³ were identified regarding the clinical utility of magnetic resonance imaging screening for prostate cancer. In addition, nine evidence-based guidelines⁴⁻¹² were identified regarding the use of magnetic resonance imaging for prostate cancer screening.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments

1. Brown LC, Ahmed HU, Faria R, et al. Multiparametric MRI to improve detection of prostate cancer compared with transrectal ultrasound-guided prostate biopsy alone: the PROMIS study. *Health Technol Assess* 2018;22(39).
https://www.ncbi.nlm.nih.gov/books/NBK513447/pdf/Bookshelf_NBK513447.pdf. Accessed 2019 Oct 16.

Systematic Reviews and Meta-analyses

2. Moldovan PC, Van den Broeck T, Sylvester R, et al. What is the negative predictive value of multiparametric magnetic resonance imaging in excluding prostate cancer at biopsy? A systematic review and meta-analysis from the European Association of Urology Prostate Cancer Guidelines Panel. *Eur Urol*. 2017 08;72(2):250-266.
[PubMed: PM28336078](#)

Randomized Controlled Trials

3. Kasivisvanathan V, Rannikko AS, Borghi M, et al. MRI-targeted or standard biopsy for prostate-cancer diagnosis. *N Engl J Med*. 2018 May 10;378(19):1767-1777.
[PubMed: PM29552975](#)

Guidelines and Recommendations

4. European Association of Urology. Prostate cancer. 2019;
<https://uroweb.org/guideline/prostate-cancer/>. Accessed 2019 Oct 16.
See Section 5.2.4.4.
5. National Institute for Health and Care Excellence. Prostate cancer: diagnosis and management. (NICE guideline NG131). 2019; <https://www.nice.org.uk/guidance/ng131>. Accessed 2019 Oct 16.
See Section 1.2 – Assessment and Diagnosis
6. Rendon RA, Mason RJ, Marzouk K, et al. Canadian Urological Association recommendations on prostate cancer screening and early diagnosis. *Can Urol Assoc J*. 2017;11(10):298-309.
<https://www.cua.org/themes/web/assets/files/4888.pdf>. Accessed 2019 Oct 16.
See Recommendation #5

7. Haider MA ,Yao X, Loblaw A et al. Evidence-based guideline recommendations on multiparametric magnetic resonance imaging in the diagnosis of prostate cancer: a Cancer Care Ontario clinical practice guideline. *Can Urol Assoc J.* 2017;11(1-2):E1-7 <http://www.cuaj.ca/index.php/journal/article/download/3968/2970>. Accessed 2019 Oct 16.
See Recommendation #1
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[PubMed: PM28473080](#)
9. Fandella A, Scattoni V, Galosi A, et al. Italian Prostate Biopsies Group: 2016 updated guidelines insights. *Anticancer Res.* 2017 02;37(2):413-424.
[PubMed: PM28179286](#)
10. Mottet N, Bellmunt J, Bolla M, et al. EAU-ESTRO-SIOG guidelines on prostate cancer. part 1: screening, diagnosis, and local treatment with curative intent. *Eur Urol.* 2017 04;71(4):618-629.
[PubMed: PM27568654](#)
11. Department of Health. Diagnosis, staging and treatment of patients with prostate cancer. (*National Clinical Guideline No. 8*) 2016;
<https://www.gov.ie/en/collection/26ce6e-diagnosis-staging-and-treatment-of-patients-with-prostate-cancer/>. Accessed 2019 Oct 16.
See: 2.3 Radiology and Diagnosis
12. Haider MA ,Yao X, Loblaw A et al. Multiparametric magnetic resonance imaging in the diagnosis of clinically significant prostate cancer: a Cancer Care Ontario clinical practice guideline. 2015;
https://www.cancercareontario.ca/sites/ccocancercare/files/guidelines/full/pebc27-2f_1.pdf. Accessed 2019 Oct 16.
See Recommendations #1 and #2

Appendix — Further Information

Previous CADTH Reports

13. Magnetic resonance imaging for prostate assessment: a review of clinical and cost-effectiveness. (*CADTH Rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2018:
<https://www.cadth.ca/magnetic-resonance-imaging-prostate-assessment-review-clinical-and-cost-effectiveness-0>. Accessed 2019 Oct. 16.
14. Magnetic resonance spectroscopic imaging for prostate disease detection: clinical and cost-effectiveness, and guidelines. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2014:
<https://www.cadth.ca/magnetic-resonance-spectroscopic-imaging-prostate-disease-detection-clinical-and-cost-effectiveness>. Accessed 2019 Oct. 16.

Systematic Reviews and Meta-analyses – Diagnostic Accuracy

Magnetic Resonance Imaging

15. Drost FH, Osses DF, Nieboer D, et al. Prostate MRI, with or without MRI-targeted biopsy, and systematic biopsy for detecting prostate cancer. *Cochrane Database Syst Rev*. 2019 04 25;4:CD012663.
[PubMed: PM31022301](#)
16. Godley KC, Syer TJ, Toms AP, et al. Accuracy of high b-value diffusion-weighted MRI for prostate cancer detection: a meta-analysis. *Acta Radiol*. 2018 Jan;59(1):105-113.
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[PubMed: PM29093748](#)

Magnetic Resonance Imaging with Biopsy

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[PubMed: PM31130434](#)
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[PubMed: PM30108376](#)
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[PubMed: PM31204311](#)
24. Sarkar D. The Role of multi-parametric MRI and fusion biopsy for the diagnosis of prostate cancer - a systematic review of current literature. *Adv Exp Med Biol*. 2018;1095:111-123.
[PubMed: PM30229552](#)
25. Bergero MA, Martinez PF, Radtke JP, Hadaschik BA. Multiparametric-MRI-guided biopsy in the era of precision medicine. *Arch Esp Urol*. 2017 Dec;70(10):833-844.
[PubMed: PM29205162](#)
26. Monni F, Fontanella P, Grasso A, et al. Magnetic resonance imaging in prostate cancer detection and management: a systematic review. *Minerva Urol Nefrol*. 2017 Dec;69(6):567-578.
[PubMed: PM28488844](#)

Randomized Controlled Trials

Alternative Intervention

27. Porpiglia F, Manfredi M, Mele F, et al. Diagnostic pathway with multiparametric magnetic resonance imaging versus standard pathway: results from a randomized prospective study in biopsy-naive patients with suspected prostate cancer. *Eur Urol*. 2017 08;72(2):282-288.
[PubMed: PM27574821](#)
28. Panebianco V, Barchetti F, Sciarra A, et al. Multiparametric magnetic resonance imaging vs. standard care in men being evaluated for prostate cancer: a randomized study. *Urol Oncol*. 2015 Jan;33(1):17.e11-17.e17.
[PubMed: PM25443268](#)

Clinical Practice Guidelines

29. American Urological Association. Standard operating procedure for multiparametric magnetic resonance imaging in the diagnosis, staging and management of prostate cancer. 2018; <https://www.auanet.org/guidelines/mri-of-the-prostate-sop>. Accessed 2019 Oct.16.

Additional References

Consensus Statements

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[PubMed: PM30507436](#)
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[PubMed: PM28483574](#)
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