Prostate Cancer With a Normal PSA: What Does Our New Spectral CT Research Mean for Patients and Referrers?

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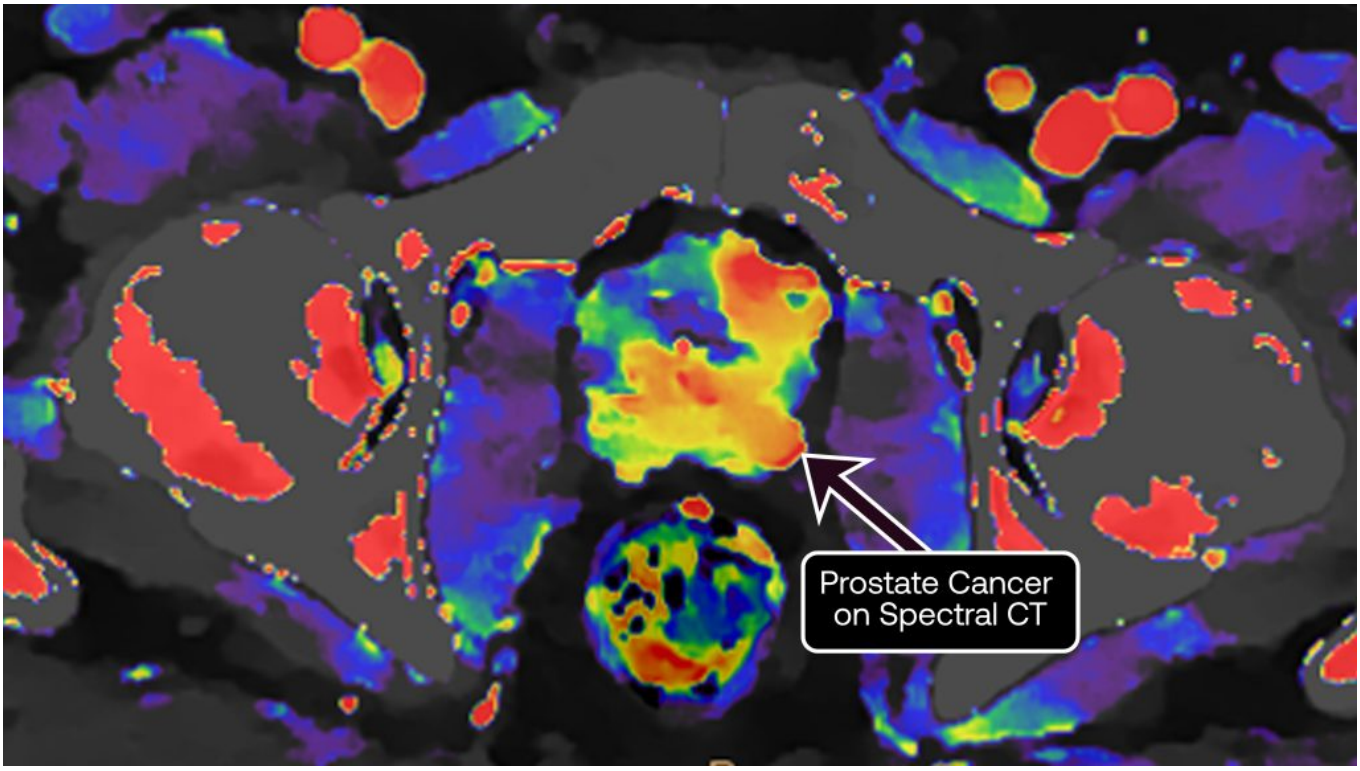

You are eligible for a rebated prostate spectral CT if you have symptoms with or without an elevated PSA!

A normal or low PSA does not completely exclude clinically significant prostate cancer. If a man has concerning symptoms or clinical findings, those symptoms still matter – and may justify further investigation.

Prostate cancer is the most commonly diagnosed cancer in Australian men. In 2025, approximately 29,000 Australian men were estimated to be diagnosed with prostate cancer, representing around 30% of all cancers diagnosed in males.[1]

PSA is an extremely useful test, but it should not be interpreted as an absolute rule-out test.

Recent Australian-led research examined men with PSA levels below 4 ng/mL who nevertheless had sufficient clinical concern to proceed to prostate biopsy. Among this selected higher-risk population, clinically significant prostate cancer was identified in 34%.[2] This does not mean that 34% of men with a low PSA have prostate cancer. It demonstrates something more clinically relevant: ***when other reasons for concern exist, a relatively low PSA should not necessarily end the investigation.***

If the PSA is not elevated, what comes next?

Multiparametric prostate MRI is the established dedicated imaging examination when prostate cancer is suspected. However, Medicare eligibility for prostate MRI is relatively prescriptive.

For Medicare-rebated diagnostic prostate MRI, current eligibility is based principally on a suspicious digital rectal examination or specified PSA, free-to-total PSA, age and family-history criteria, and the examination must be requested by an eligible specialist.[3] Consequently, a patient may have clinically concerning symptoms yet not satisfy the Medicare criteria for a rebated prostate MRI.

PSMA PET/CT is another extraordinarily powerful prostate cancer imaging technique, but it is generally used in appropriately selected clinical circumstances rather than simply as the first investigation of non-specific symptoms. It also involves ionising radiation.

This is where **CT of the pelvis deserves consideration as another diagnostic tool when clinically appropriate.**

A CT pelvis does not require an elevated PSA

The Medicare descriptor for a contrast-enhanced CT pelvis (MBS item 56412) does not specify an elevated PSA as a requirement.[4]

The important distinction is between screening an asymptomatic person without a clinical indication and investigating a patient who has symptoms, examination findings or another legitimate clinical reason for pelvic imaging.

A negative PSA does not make the patient's symptoms disappear.

Where symptoms or other findings create an appropriate clinical indication for pelvic imaging, the referrer and radiologist can consider CT alongside other available investigations. The appropriate examination will, of course, depend upon the individual clinical presentation.

Spectral CT also has practical advantages. It is fast and typically available at short notice. ARPANSA estimates a typical adult CT pelvis at approximately 6 mSv, equivalent to about four years of Australian natural background radiation or approximately 300 chest X-rays.[5] By comparison, ARPANSA lists a typical PET/CT at approximately 14 mSv, while MRI uses no ionising radiation.[5] Actual CT dose varies according to the scanner, protocol and individual patient.

So what has spectral CT changed?

Historically, CT has had a limited role in detecting primary prostate cancer because tumour can be difficult to distinguish from surrounding prostate tissue on conventional CT. Spectral CT, however, provides additional information about tissue composition and iodine distribution that is not available from a conventional CT image alone.

Our newly published research in *Radiology Case Reports* demonstrates why spectral CT may provide additional information.[6]

In our biopsy-proven case of high-grade prostate adenocarcinoma, the prostate abnormality was poorly conspicuous on conventional CT. However, when we interrogated the spectral information contained within the CT acquisition, the abnormality became substantially more apparent using 40-keV virtual monoenergetic imaging and quantitative iodine mapping.

Importantly, this corresponded spatially with marked diffusion restriction and a PI-RADS 5 abnormality on 3T prostate MRI, intense uptake on PSMA PET, and ultimately biopsy-proven bilateral high-grade prostate adenocarcinoma.[6]

The study does not establish spectral CT as a replacement for prostate MRI, PSMA PET or biopsy. It is a case report, and prospective studies are required to determine its sensitivity and diagnostic performance.

But it demonstrates that spectral CT can reveal additional information about prostate tissue that may be poorly conspicuous on conventional CT.[6]

What does this mean for patients and referrers?

The practical message is simple:

Do not treat the PSA result in isolation. Treat the patient and the clinical presentation.

A man with persistent or concerning pelvic or urinary symptoms, abnormal examination findings, significant risk factors or another clinical indication for pelvic investigation may still warrant further assessment despite a non-elevated PSA.

Spectral CT gives us another way of interrogating the prostate as part of a patient work up.

For patients, that potentially means more information from an appropriately indicated CT examination. For referrers, it means another imaging tool when the clinical presentation remains concerning even though the PSA result may initially appear reassuring.

And for prostate cancer imaging, it raises an important research question:

Can advanced spectral CT help identify clinically significant prostate cancer in symptomatic or higher-risk men who might otherwise be difficult to identify through conventional pathways?

Our published case suggests that this is a question worth investigating.

Further reading from MBR Health

To learn more about advanced prostate and cancer imaging, Spectral CT and the research behind this article:

- What Is Spectral CT? A Simple Patient Guide — How Spectral CT differs from conventional CT, including iodine mapping, virtual monoenergetic imaging and material analysis.
- Spectral CT in Cancer Imaging: What Patients Should Know — How Spectral CT can contribute to cancer detection, characterisation, staging and follow-up alongside MRI, PET/CT and other imaging.
- Dedicated Cancer Imaging at MBR Health — MBR Health's approach to prostate cancer imaging and other dedicated oncology imaging using 3T MRI, Spectral CT, ultrasound and other modalities.
- CT Scan: What to Expect Before, During and After Your Appointment — A practical patient guide to CT preparation, intravenous contrast, radiation and what happens during a CT examination.
- Why Medical Imaging Quality Matters: Scanner, Protocol and Expertise — Why the scanner alone does not determine diagnostic quality and how protocol selection, acquisition and specialist interpretation affect the information obtained.
- MBR Health Research & Publications — Explore peer-reviewed publications and clinical research from the MBR Health and Mermaid Beach Radiology team.

References

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2. Sii S, Papa N, Yiu TW, Tempo J, Qu L, Perera M, et al. Utility of PSA free-to-total ratio for clinically significant prostate cancer in men with a PSA level of <4 ng/mL. *BJU Int*. 2025;135(4):550–556. doi:10.1111/bju.16597.
3. Australian Government Department of Health and Aged Care. Medicare Benefits Schedule: multiparametric MRI of the prostate, items 63541–63544. Canberra: Australian Government.
4. Australian Government Department of Health and Aged Care. Medicare Benefits Schedule. Item 56412: computed tomography—scan of pelvis with intravenous contrast medium. Canberra: Australian Government.
5. Australian Radiation Protection and Nuclear Safety Agency. *Having a scan? A guide for medical imaging*. Melbourne: ARPANSA; 2024.
6. Sherif Z, Sherif K, Forbes A. Multimodality imaging of high-grade prostate adenocarcinoma with diffusion MRI, PSMA PET and dual-layer spectral CT: a case report. *Radiol Case Rep*. 2026;21:6131–6136. doi:10.1016/j.radcr.2026.08.066.

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