

Researchers to investigate screening for prostate cancer using MRI—potentially replacing the PSA test

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Credit: Medical Research Council

A new clinical study will test for the first time if MRI scans can be used for population screening to detect prostate cancer more accurately. The current prostate-specific antigen (PSA) test is considered too unreliable for population screening, and the scientists will study if MRI could be used to screen men to pick up cancers earlier and more reliably, and help save lives.

They will also study whether, combined with cutting-edge techniques

such as genomics and machine learning, MRI scans can replace [prostate biopsies](#). Prostate [cancer](#) patients advising the study say they are particularly excited by the prospect of large reduction in biopsies, as they have serious side effects in the majority of patients, which include pain, bleeding, infections leading to sepsis, and urine retention (sudden inability to empty the bladder).

The study is being launched with funding of £4.1m from the Medical Research Council and £1m from Cancer Research UK, as part of the MRC's Stratified Medicine Initiative. The initiative is investing a total of £16.8m in four new 'stratified medicine' studies that aim to develop ground-breaking approaches in treating [prostate](#) cancer, kidney disease, alcoholic hepatitis and childhood arthritis.

The prostate cancer study will be led by Professor Mark Emberton opens in new window at UCL, in partnership with King's College London, the Imperial College London and at least 12 industry partners.

It builds on a ground-breaking study led by Professor Emberton and colleagues, published in The Lancet opens in new window last year, which reported that MRI scans for men who had a positive PSA test could rule out prostate cancer in 27% of the men tested, meaning they could avoid having a biopsy. They also found that for men with a possible tumour, the MRI scan could be used to direct the biopsy needle to the right location, so 18% more cases of serious prostate cancer were detected.

Replacing biopsies with precision diagnosis

The team aims to recruit 1,000 men with medium to high risk cancers to find out if MRI can be combined with other high-tech diagnostic tests to predict cancer progression. The ultimate aim is to develop tests that are better than biopsies for targeting the right cancer treatment to the right

person (including determining if they don't need treatment).

Professor Emberton said: "Our recent studies have begun to show how MRI technology will transform [prostate cancer screening](#) and diagnosis. Now we're starting an ambitious new study, to combine MRI with the latest technologies – such a machine learning on MRI images and detecting DNA shed by cancers in blood – to see if we can find a way to make prostate cancer testing more reliable and maybe even do away with the need for biopsies altogether. We want to use MRI combined with new diagnostic tests to predict how the cancer will progress and to target the right treatment to the right person."

Professor Sir John Savill, until recently Chief Executive at the MRC, said: "Stratified medicine is reshaping the medical landscape by taking a patient-first approach that looks at how – and why – different groups of patients respond differently to therapies. Instead of looking for a 'one-size-fits-all' solution, stratified medicine is increasing what we know about diseases and how they affect individuals, and applying these findings to current tools in diagnostics and treatment to improve health outcomes."

Could MRI give us the first reliable population screening for prostate cancer?

Currently, the PSA blood test for prostate cancer is considered too unreliable opens in new window to be used for population screening in the UK: about 75% of men opens in new window who get a positive result are not found to have cancer (a false positive), and it misses the cancer in about 15% of men with prostate cancer (a false negative).

In this study, the researchers will also be taking the MRI test out into the community for the first time to see how well it detects prostate

abnormalities in 300 men aged 60 to 75 who have never had a PSA test.

Professor Emberton said: "We will be testing if the MRI can be used for screening men and we hope that it will detect serious cancers earlier that are currently missed. If we can detect cancers earlier and more reliably with a non-invasive test, this could help to improve the survival rates to prostate cancer, which kills about 11,800 men in the UK annually.

MRI scanning for prostate cancer could also help a quarter of a million men, maybe up to half a million men a year, to avoid an unnecessary biopsy if the MRI is negative. The majority of men will be reassured they don't have prostate cancer and importantly they may be able to avoid the harms of a biopsy, plus healthcare systems will be able to avoid the costs. MRI is the perfect tool because it's relatively cheap, widely available and reliable."

Dr. Ian Walker, Cancer Research UK's director of clinical research, said: "We're delighted to partner with the MRC to support such an ambitious project. Providing men with an accurate diagnosis is one of the biggest challenges in [prostate cancer](#). Current tests are blunt and unreliable when it comes to helping doctors decide what course of action is best. Too many men are treated for cancers that would never have caused them harm and some cancers are missed altogether. By exploring the potential of new diagnostic methods – such as advances in imaging and blood tests – we're aiming to improve how the disease is diagnosed and treated."

Provided by Medical Research Council

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