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Clinical study review

# Impact of MRI-targeted biopsy in detection and classification of prostate cancer

## Purpose of study

**Diagnosing prostate cancer using prostate specific antigen (PSA), a digital rectal exam (DRE) and systematic, random biopsy techniques together can lead to uncertainty in depicting the degree of aggressiveness of a patient's disease which can result in unnecessary treatment. A study conducted by Ahdoot et al. at the U.S. National Cancer Institute (NCI), National Institutes of Health (NIH), Bethesda, Maryland, compared the standard of care with the added use of MRI-targeted biopsies and assessed how it clinically impacted the effectiveness of diagnosis and treatment. The following is a summary of the study published in the New England Journal of Medicine[1].**

## Overview

Researchers studied men with MRI-visible prostate lesions who underwent both a targeted, fusion biopsy and also a standard, systematic biopsy to assess differences in cancer detection and cancer grade group classifications. Of the 2,103 men participating in the study, 19% subsequently underwent radical prostatectomy. Whole-mount specimen analysis after surgery was compared to both sets of biopsy results, independently and combined, to stratify cancer grade reclassification between biopsy and radical prostatectomy.

## Results

In direct comparisons, the added event of MRI-targeted biopsy resulted in 208 (10%) more prostate cancer diagnoses than systematic biopsy alone and was responsible for 458 (22%) upgrades in cancer aggressiveness. Of the cohorts that received radical prostatectomy, underdiagnosed cases decreased from 40% to 14% when combined with fusion biopsy. In cases that had the most aggressive cancers, underdiagnoses dropped to 3.5% with combined approaches.

## Clinical significance

**The use of blind systematic prostate tissue samples used to detect cancer alone can lead to misperceptions in aggressiveness of cancer, its location, and possible undertreatment or overtreatment. The added use of MRI images merged with real-time ultrasound guidance during biopsy procedures can lead to more cancer detection, insight to cancer location, and grading of cancer severity for informed clinical decision making.**


**Reference**

1. Ahdoot, M.D, M., Wilbur, B.S, A. R., Reese, Ph.D., S. E., Lebastchi, M.D., A. H., Mehralivand, M.D., S., Gomella, M.D., P. T., ... Linehan, M.D., W. M. (2020). MRI-Targeted, Systematic, and Combined Biopsy for Prostate Cancer Diagnosis. The New England Journal of Medicine, 382: 917–928. doi: 10.1056/NEJMoa1910038



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