Re: Phantom Study of a Novel Stereotactic Prostate Biopsy System Integrating Preinterventional Magnetic Resonance Imaging and Live Ultrasonography Fusion

(From: Kuru TH, Roethke M, Popeneciu V, et al.
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Dear Editor:

PROSTATE BIOPSIES MAY SOON be “unblinded” as new techniques are translated to clinic that add MRI to transrectal ultrasonographic guidance. The team from Heidelberg

is to be commended for performing an elegant phantom study defining the accuracy of their novel MRI-ultrasound fusion-guided biopsy system using stereotaxy. The targeting error of under a millimeter is certainly impressive and should translate into clinical benefit.

The National Institutes of Health urology and radiology teams have developed and implemented a similar approach over the past decade using electromagnetic tracking to register the preprocedural MRI to the real-time ultrasonography in an outpatient office-based setting to track the location of more than 11,000 biopsies in more than 600 patients, with an initial significant improvement in cancer detection rates in specific populations.^{1–3}

There are several different methods for MRI + ultrasound fusion-guided prostate biopsies, including electromagnetic tracking, optical tracking, stereotactic mechanical arms, and retrospective image based registration. The emergence of multiple fusion technologies that can be deployed in an office setting could augment the “blind” or “random” transrectal ultrasonography guided prostate biopsy for patients with anterior lesions, central zone lesions (Fig. 1), previously negative biopsy in the face of a rising prostate-specific antigen level, or patients undergoing active surveillance for low Gleason score prostate cancers.¹

The team from Heidelberg has shown tremendous accuracy with their system, which should translate into fertile ground for clinical impact as the MRI “ManoGram” matures and evolves for use in specific settings.

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Disclosure Statement

BJW and NIH have intellectual property in the field.

FIG. 1. Transrectal ultrasound and corresponding preprocedural magnetic resonance imaging with anterior gland prostate cancer target (red-blue dot) in area not normally sampled by standard blind (random or sextant) biopsy.

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Abbreviation Used

MRI = magnetic resonance imaging