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Influence of Individual Urologists and Radiologists on Variation in MRI Guided Prostate Fusion Biopsy Outcomes

Daniel A Triner¹, Jack Vercocke², Corinne Labardee¹, Alice Semerjian¹, Tudor Borza¹, Arvin George³, Brian R Lane⁴, Kevin B Ginsburg², Andrew Krumm¹, for the Michigan Urological Surgery Improvement Collaborative¹

¹University of Michigan, Ann Arbor, MI, ²Wayne State University, Detroit, MI, ³Johns Hopkins University, Baltimore, MD, ⁴Corewell Health Hospital System, Grand Rapids, MI

INTRODUCTION AND OBJECTIVE:

Multiparametric magnetic resonance imaging (MRI) guided prostate fusion biopsy improves the detection of clinically significant prostate cancer (CSPC). However, MRI guided fusion biopsy outcomes are variable and dependent on radiologists interpreting MRI and urologists performing fusion biopsies. We evaluated the contribution of radiologists and urologists to variation in fusion biopsy outcomes across a consortium of diverse, real-world practices.

METHODS:

The Michigan Urologic Surgery Improvement Collaborative registry was retrospectively reviewed for biopsy naïve men who underwent MRI guided prostate fusion biopsy between 08/2017-11/2021. The primary outcome was the proportion of variance attributed to radiologists and urologists in the detection of CSPC (\geq GG2) in the targeted biopsy region of interest. We used generalized linear mixed effects regression models and evaluated CSPC detection across lesions reported as 3, 4, or 5 on the Prostate Imaging-Reporting and Data System (PI-RADS) that were subsequently biopsied. We calculated the intra-class correlation coefficients (ICC) for urologists and radiologists and visually examined variation across radiologists and urologists for each model using caterpillar plots.

RESULTS:

We identified 1,500 biopsy naïve men with 1,982 MRI PI-RADS lesions. MRIs were read by 113 radiologists and 85 urologists performed fusion prostate biopsies. For PI-RADS 3 lesions, urologists explained more variance in the detection of CSPC compared with radiologists (ICC: 0.15 vs 0.07, respectively). For PI-RADS 4 lesions urologists and radiologists contributed similar, low variance in the detection of CSPC (ICC 0.05 vs 0.07). For PI-RADS 5 lesions, radiologists contributed notably to the variance while urologists contributed minimally (ICC 0.16 vs 0.01). Adjusted probability of CSPC detection for individual radiologists and urologists for PI-RADS 3 and 5 lesion are shown in in **Figure 1**.

CONCLUSIONS:

These data highlight the complex interplay as to how urologists and radiologists influence variation in prostate fusion biopsy CSPC detection. Given the heterogeneity in fusion biopsy outcomes, urologists must track and understand their and their radiologists' MRI and prostate biopsy outcomes when utilizing MRI to inform decision making.

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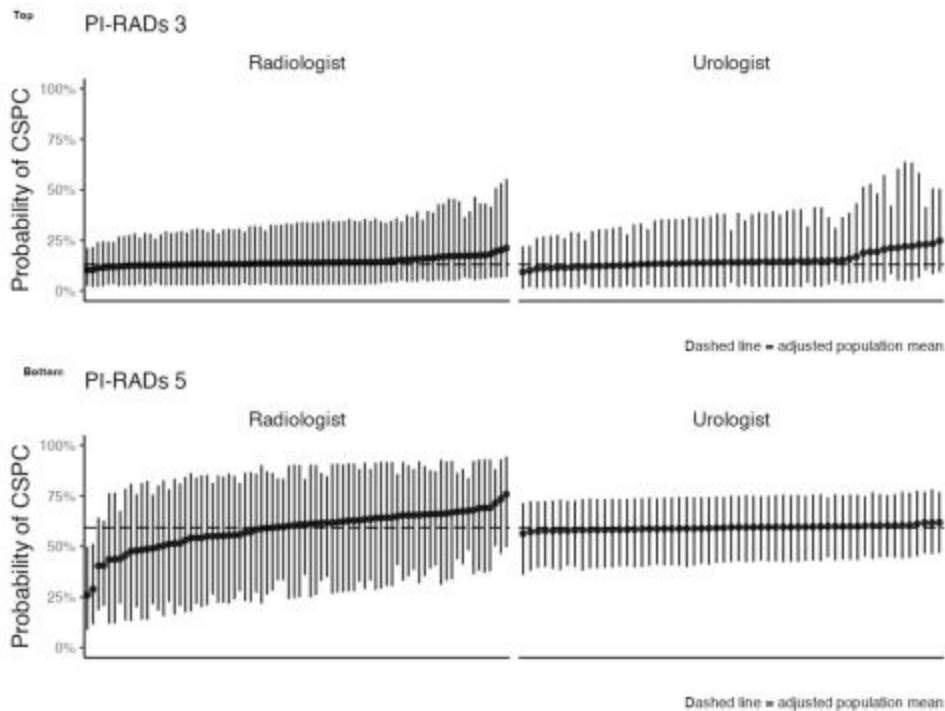


Figure 1: Rate of CSPC detection of individual radiologists and urologists for PI-RADS 3 (top) and PI-RADS 5 (bottom) lesions. Each point represents the adjusted CSPC for individual radiologists or urologists and bars represent within-provider variance. The dash line represents the adjusted population mean.

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