INTRODUCTION AND OBJECTIVE: While fusion biopsy (FBx) outperforms systematic biopsy, significant variation in cancer detection rates (CDR) exists, ranging from 46-70%. Patient, tumor, and imaging factors can impact FBx outcomes. However, it remains unknown to what extent differences in biopsy technique (urologists) contribute to variation in CDR.

METHODS: All men in the Michigan Urological Surgery Improvement Collaborative (MUSIC) clinical registry who underwent FBx at Michigan Medicine from August 2017 to May 2019 were included. The primary outcome was CDR by targeted cores. Secondary outcomes were GGG\geq2 CDR on targeted cores stratified by PIRADS score and achieving MUSIC FBx scorecard benchmark measures. Bivariate and multivariable logistic regression analyses was performed to assess variation in CDR at the FBx provider level adjusting for age, PSA, race, family history, clinical stage, prior cancer diagnosis, number of lesion, number of cores taken and PIRADS score.

RESULTS: A total of 708 FBx were performed by five providers, whose volume ranged from 77-199 FBx during the study period. Figure 1a. demonstrates distribution of patient factors by provider. There was no significant difference in targeted CDR across providers. (Figure 1b) Adjusted overall CDR with targeted cores on FBx ranged from 54-74% across providers (adjusted p = 0.60) with an average CDR rate of 60.7%. CDR for all providers met the MUSIC quality benchmark of >45%. GGG\geq2 CDR in PIRADS 3 ranged from 0-15% across the five providers (unadjusted p = 1.000) with an average GGG\geq2 CDR of 10.5%. Risk adjusted GGG\geq2 CDR in PIRADS 4 ranged from 34-59% across providers (adjusted p = 0.134) with an average GGG\geq2 CDR of 34.8%. Risk adjusted GGG\geq2 CDR in PIRADS 5 ranged from 70-86% across providers (adjusted p = 1.000) with an average GGG\geq2 CDR of 70.2%.

CONCLUSIONS: We found no difference in cancer detection rates by targeted cores across fusion biopsy providers and no significant difference in GGG\geq2 detection rates for PIRADS 3, 4, and 5 lesions. These findings suggest that differences in FBx technique may not contribute to overall variation in CDR in FBx performed by experienced providers. Although we did not find a statistically significant variation in CDR across providers, it is possible that there is room for QI work to decrease the demonstrated variation in CDR.

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