Head-to-head comparison of PI-RADS 2 vs. PI-RADS 2.1: Moderate agreement and slight changes in scoring and cancer localization

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PURPOSE
Our goal was to evaluate the novel scoring system in an intra-lesion comparison to the previous version 2 with respect to scoring variability, cancer detection and usage of the new prostate segments.

METHOD AND MATERIALS
3.0 T-MRI Datasets of 200 patients with MRI/TRUS biopsy (10-core systematic and targeted biopsies) were evaluated in a blinded / randomized setting. Lesions were marked and PI-RADS 2 and PI-RADS 2.1 assessment categories were assigned by one of three experienced radiologists (>5 years of reporting prostate MRI), with at least 6 months between the reading sessions. Tumor location and histopathology results were correlated and detection rates of clinically significant PCa (csPCa; >=Gleason 3+4) were tabulated against the scores for both versions.

RESULTS
214 lesions were identified and compared, 135 (63.1%) in the peripheral zone (PZ), 79 (36.9%) in the transition zone (TZ). There was no significant difference in the median PI-RADS 2 vs. 2.1 score (Wilcoxon signed rank PZ: p=0.8 and TZ: p=0.681). Distribution of PI-RADS-scores and csPCa detection rates for PI-RADS 2 vs 2.1 were: 1: 6 vs. 18 (16.7%/11.1%), 2: 51 vs. 31 (7.8%/12.9%), 3: 28 vs. 35 (17.9%/14.7%), 4: 60 vs. 59 (47.5%/44.1%), 5: 69 vs. 71 (62.3%/62.0%). Cohen's kappa for PI-RADS 2 vs. 2.1 was 0.568 and Cohen's weighted kappa was 0.78. Separated by zones detection rates were (PZ, PI-RADS 2/2.1) 1: 33.3%/22.2%, 2: 10.0%/16.7%, 3: 16.7%/14.3%, 4: 47.2%/47.1% and 5: 65.0%/63.4% and (TZ, PI-RADS 2/2.1) 1: 0.0%/0.0%, 2: 6.5%/10.5%, 3: 20.0%/15.4%, 4: 50.0%/25.0% and 5: 58.6%/60.0%. ROC analysis of the significant cancer detection accuracy revealed an AUC of 0.718 (CI 95% 0.631-0.805, PI-RADS 2) and 0.702 (0.613-0.791, PI-RADS 2.1) for peripheral zone lesions and 0.806 (0.706-0.907, PI-RADS 2) and 0.803 (0.702-0.904, PI-RADS 2.1) for transition zone cancers (p>0.05 for both comparisons). The new segments (Left/Right Base PZm) were marked in 5/135 (3.7%) of the PZ lesions.

CONCLUSION
Comparing PI-RADS 2 vs. 2.1 showed slight changes in the overall scoring with more pronounced changes in the lower scores and moderate to good intra-reader agreement between the two versions. ROC-performance remained stable at a high level for both PZ and TZ and the newly added segments are used in few instances. Overall, PI-RADS 2.1 introduces slight changes which should not prevent an immediate application of the new version.