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Platinum Priority – Editorial

Referring to the article published on pp. 582–583 of this issue

Reply to Jochen Walz. Let's Keep It at One Step at a Time: Why Biparametric Magnetic Resonance Imaging Is Not the Priority Today. *Eur Urol* 2019;76:582–3

How to Implement High-quality, High-volume Prostate Magnetic Resonance Imaging: Gd Contrast Can Help but Is Not the Major Issue

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We would like to thank Professor Walz [1] for his thoughtful Platinum Priority editorial on our paper [2]. His comprehensive clinical interpretation and comments raise some important issues that we would like to respond to.

With the new 2019 European Association of Urology (EAU) guidelines on prostate cancer (PCa) [3] there will be a “tsunami” of referrals for multiparametric magnetic resonance imaging (mpMRI). Besides an appropriate quality-controlled education program, a higher scan output is needed to provide reliable and reproducible quality. To face this challenge, the possibility of reducing the imaging time must be considered.

With high-quality standard image acquisition and reading, according to Prostate Imaging-Reporting and Data System (PI-RADS) v2.1, the proportion of “nonsuspicious” (PI-RADS 1–2) or “highly likely for high-grade PCa” (PI-RADS 5) mpMRI findings will increase, and the number of “equivocal” or “uncertain” PI-RADS 3 lesions will decrease. As can be seen in our study, omission of the gadolinium (Gd) dynamic contrast-enhanced (DCE) images resulted in a minor increase (6.4–7.8%) in PI-RADS 3 diagnoses [2]. Additional removal of two of the three T2-weighted imaging planes resulted in a further increase to 11%. This shows that even dedicated urologists become more uncertain if the overall image information is reduced.

We strongly agree with Professor Walz that improving reader experience is now the major and most important issue to focus on, and that we should try to reduce the individual PI-RADS 3 scores.

In a previous study we showed a positive outcome from a “dedicated” radiologist training program to improve inter-reader agreement and biopsy decisions [4]. There was overall agreement by concordant PI-RADS score between a radiologist from a non-university center and central reading of 88% and overall agreement of concordant assessments (decision on whether to perform biopsy or not) of 94%. Greer et al. [5] showed that moderately experienced readers are more likely to assign a PI-RADS 3 score to lesions than highly experienced readers are. Besides a “total” read, Kasivisvanathan et al. [6] performed “central” reading of their mpMRI scans in a quarter of cases. The central reading was performed by two radiologists with 5 and 15 yr of prostate MRI experience, with an average of 1000 mpMRIs per year, whereas the total reads were performed by radiologists with an average of 300 mpMRIs per year with at least 5 yr of experience. The central reading had a PI-RADS 3 score frequency of 6.3% versus 21% for the total reads. Compared to the total reads, central reading resulted in more “nonsuspicious” (PI-RADS 1–2) scores (29% vs 36%) and more “highly likely for high-grade PCa” (PI-RADS 5) scores (22% vs 33%; Fig. 1).

For PCa staging, the most important images are the “anatomic” high-resolution T2-weighted images in multiple planes. The value of additional DCE MRI depends on reader performance. Fütterer et al. [7] showed that for experienced readers the additional use of DCE images did not improve staging. However, for less experienced readers the use of DCE parametric maps resulted in a significant staging improvement compared to T2-weighted imaging alone. If the quality of T2-weighted and diffusion-weighted images is low or if there is limited reader experience, the use of additional DCE images should be considered. In other cases, the triplanar biparametric MRI protocol can be safely used. The “fast” single-plane biparametric MRI protocol is not suitable for staging and should be restricted to a screening-like setting,

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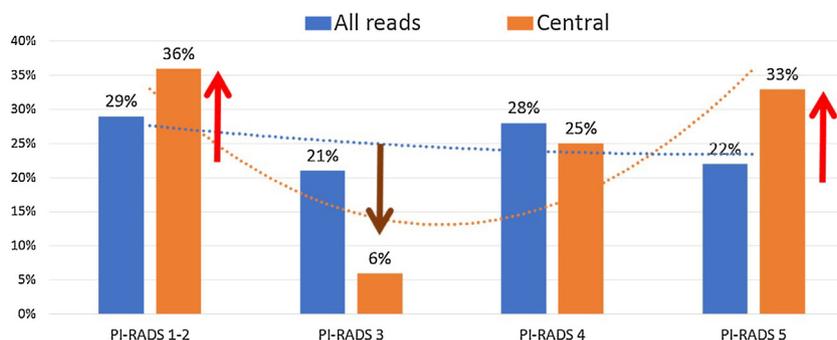


Fig. 1 – Prostate Imaging-Data and Reporting System (PI-RADS) distribution of total (all) reads versus central reads [7]. The “central” -highly experienced- reads show less “uncertain” PI-RADS 3 diagnoses (brown arrow), and more certain PI-RADS 1-2 and PI-RADS 5 diagnoses (red arrows). The “total”-less experienced- readsreads have an equal PI-RADS distribution (blue stippled line), whereas the highly experienced reads show a curved line (brown stippled line) indicating a higher level of certainty.

in which the risk of high-grade PCa is expected to be relatively low.

It should be noted that a contrast injection makes prostate MRI a more costly and invasive technique and is associated with potential side effects. DCE MRI may lead to allergic reactions, to Gd deposition in the brain, and in cases of renal insufficiency to nephrogenic systemic fibrosis. Therefore, the pros and cons for each Gd contrast administration should be carefully considered. If possible, other ways to decrease “uncertain” PI-RADS 3 diagnoses should also be investigated. For example, double-reading of images by high-volume high-expertise centers might improve the performance of less experienced radiologists.

Finally, another critical issue is the quality of image acquisition [8]. Even though most centers adhere to the PI-RADS v2.1 recommendations, studies have shown that prostate MR images are acquired with wide variation in compliance and quality [9,10]. We agree with Professor Walz that quality standards to facilitate optimal performance of prostate MRI acquisition and interpretation should be set and regulated. All prostate MRI scanners should be subject to quality control. Radiologists must be thoroughly trained and systematically evaluated; in other words, certification is required.

Conflicts of interest: The authors have nothing to disclose.

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