and management of pediatric thyroid nodules (3). Of the 136 nodules that underwent FNA in that series, 13 (10%) were nondiagnostic, a rate much lower than Dr Triana and colleagues report. We did not use genetic testing for any of the patients in our series, as the genetic tests have not been validated in or approved for the pediatric population.

Disclosures of Conflicts of Interest: **D.M.R.** disclosed no relevant relationships. **C.B.B.** disclosed no relevant relationships. **M.C.F.** disclosed no relevant relationships.

References

1. Richman DM, Benson CB, Doubilet PM, et al. Thyroid nodules in pediatric patients: sonographic characteristics and likelihood of cancer. Radiology 2018;288(2):591–599.
2. Francis GLO, Waguespack SG, Bauer AJ, et al. Management guidelines for children with thyroid nodules and differentiated thyroid cancer. Thyroid 2015;25(7):716–759.
3. Tessler FN, Middleton WD, Grant EG, et al. ACR Thyroid Imaging, Reporting and Data System (TI-RADS): white paper of the ACR TI-RADS committee. J Am Coll Radiol 2017;14(5):587–595.

Simplified PI-RADS with Biparametric MRI: A Practical Approach to Improve Management of PI-RADS Version 2 Category 3 Lesions

From
Michele Scialpi, MD,* Pietro Scialpi, MD,† Maria Cristina Aisa, PhD,* Eugenio Martorana, MD,‡ and Alfredo D'Andrea, MD§
Section of Diagnostic Imaging, Department of Surgical and Biomedical Sciences, S. Maria della Misericordia Hospital, Perugia University, S. Andrea delle Fratte, 06134 Perugia, Italy* e-mail: *michelescialpi1@gmail.com*
Division of Urology, Portogruaro Hospital, Venice, Italy†
Division of Urology, New Sassuolo Hospital, Sassuolo, Modena, Italy‡
Department of Experimental Medicine, Magrassi Lanzara, Luigi Vanvitelli, Second University of Naples, Naples, Italy§

Editor:

We read with interest and greatly appreciated the article by Dr Thai and colleagues (1) and the editorial by Dr Weinreb (2) published in the August 2018 issue of *Radiology*. Dr Thai and colleagues (1) determined that biopsy is not justified for Prostate Imaging Reporting and Data System (PI-RADS) category 2 transition zone lesions and confirmed the high accuracy of the system in the detection of significant prostate cancer (PCa).

There are several drawbacks to the study by Dr Thai and colleagues (1), some of which were correctly underlined in Dr Weinreb's editorial. We believe that there are further concerns that need to be discussed about the assessment and management of category 3 lesions (equivocal for clinically significant PCa).

Dr Thai and colleagues (1) followed the PI-RADS version 2 criteria to determine category 3 transition zone lesions by using T2-weighted imaging as the dominant sequence and diffusion-weighted imaging as the secondary sequence. Category 3 lesions (352 of 634) were sampled for biopsy, resulting in an overall cancer detection rate of 22.2% (78 of 352), whereas that for clinically significant cancer was 11.1% (39 of 352). Moreover, 91 category 3 lesions were upgraded from category 3 to category 4 on the basis of their morphologic characteristics, size (≥15 mm), and diffusion-weighted imaging criteria.

We disagree with the approach to category 3 lesions used by Dr Thai and colleagues. A simplified PI-RADS based on a biparametric MRI protocol (T2- and diffusion-weighted sequences) at 3.0 T without the use of an endorectal coil (3,4) helps identify four categories of the PI-RADS and suggests the management for each one. We consider diffusion-weighted imaging to be the dominant sequence for lesion detection in both the transition zone and the peripheral zone. To manage category 3 lesions (hypointense on T2-weighted images, hyperintense on diffusion-weighted high-*b*-value images, and moderately hypointense on apparent diffusion coefficient maps), we considered lesion volume as a discriminator (cutoff, 0.5 mL) according to the Epstein criteria (5), identifying two subgroups (3a and 3b) for category 3 lesions.

In a previous study (4), category 3a lesions (volume < 0.5 mL) included significant PCa in 2.8% of the cases in which clinical surveillance (prostate-specific antigen and repeat biparametric MRI within 12 months) was recommended. Category 3b lesions (volume ≥ 0.5 mL) included significant PCa in 27.6% of the cases in which targeted biopsy was recommended (4). For category 3a lesions, our simplified PI-RADS approach avoided 60.5% of the biopsies, missing a negligible percentage of significant PCa. Therefore, we believe that the adoption of our simplified PI-RADS could facilitate category 3 lesion management and may avoid unnecessary biopsies.

Disclosures of Conflicts of Interest: **M.S.** disclosed no relevant relationships. **P.S.** disclosed no relevant relationships. **M.C.A.** disclosed no relevant relationships. **E.M.** disclosed no relevant relationships. **A.D.** disclosed no relevant relationships.

References

1. Thai JN, Narayanan HA, George AK, et al. Validation of PI-RADS version 2 in transition zone lesions for the detection of prostate cancer. Radiology 2018;288(2):485–491.
2. Weinreb JC. Organized chaos: does PI-RADS version 2 work in the transition zone? Radiology 2018;288(2):492–494.
3. Scialpi M, D'Andrea A, Martorana E, et al. Biparametric MRI of the prostate. Turk J Urol 2017;43(4):401–409.
4. Scialpi M, Aisa MC, D'Andrea A, Martorana E. Simplified prostate imaging reporting and data system for biparametric prostate MRI: a proposal. AJR Am J Roentgenol 2018;211(2):379–382.
5. Epstein JI, Walsh PC, Carmichael M, Brendler CB. Pathologic and clinical findings to predict tumor extent of nonpalpable (stage T1c) prostate cancer. JAMA 1994;271(5):368–374.

Response

From
Baris Turkbey, MD, and Peter L. Choyke, MD
Molecular Imaging Program, National Cancer Institute, National Institutes of Health, 10 Center Dr, Room B3B85, Bethesda, MD 20892
e-mail: *turkbeyi@mail.nih.gov*

We thank Dr Scialpi and colleagues for their comments. A wag once wrote that "the great thing about standards is that there are so many of them." It alludes to the problem that all standards have flaws and there is a tendency for the sprouting

of new standards in response. Standards must be continuously reviewed and revised, a process inherent in the PI-RADS process. However, to achieve the benefits of standards (uniformity of communication, training, methodology, etc), it is important to maintain that standard until a widely agreed upon revision can take its place. A key component of the current PI-RADS version 2 is that scoring should be based on the appropriate dominant pulse sequence for the location of the lesion, an approach that has worked well. Dr Scialpi and colleagues suggest an alternate standard to PI-RADS version 2 that is based on biparametric MRI and that abandons the dominant pulse sequence concept in favor of a diffusion-weighted imaging–dominant approach for all locations. The major reason this was not adopted in PI-RADS version 2 is the very common problem of very low diffusion within many benign prostatic hyperplasia nodules in the transition zone. We believe this continues to be an issue that is partly addressed by the dominant sequence concept. However, it is possible that, as experience is gained in recognizing benign prostatic hyperplasia nodules, this will no longer be necessary and diffusion-weighted imaging can be used as a dominant sequence.

In addition, Dr Scialpi and colleagues propose the use of lesion volume estimation to create a subcategory of score 3 lesions that do not require biopsy. Although this suggestion has merit in potentially reducing the number of biopsies, it is balanced by well-known limitations of MRI in correctly estimating lesion volume and significant variability of lesion measurement and mapping among different radiologists (1,2). As experience grows and there is increased reliance on biparametric MRI, there will be an increasing need to adapt PI-RADS for the detection of clinically significant PCa (3,4). However, this should be part of the ongoing process of continuous improvement for PI-RADS in which both incremental and substantial changes are carefully vetted and backed by prospectively designed clinical trials with reliable histopathologic-imaging correlation. Following this path is the way to avoid the trap of too many standards to choose from.

Disclosures of Conflicts of Interest: B.T. disclosed no relevant relationships. P.L.C. disclosed no relevant relationships.

References

1. Greer MD, Shih JH, Barrett T, et al. All over the map: an interobserver agreement study of tumor location based on the PI-RADSv2 sector map. J Magn Reson Imaging 2018;48(2):482–490.
2. Borofsky S, George AK, Gaur S, et al. What are we missing? False-negative cancers at multiparametric MR imaging of the prostate. Radiology 2018;286(1):186–195.
3. Kuhl CK, Bruhn R, Krämer N, Nebelung S, Heidenreich A, Schrading S. Abbreviated biparametric prostate MR imaging in men with elevated prostate-specific antigen. Radiology 2017;285(2):493–505.
4. Obmann VC, Pahwa S, Tabayayong W, et al. Diagnostic accuracy of a rapid biparametric MRI protocol for detection of histologically proven prostate cancer. Urology doi: 10.1016/j.urology.2018.08.032. Published online September 7, 2018. Accessed September 23, 2018.