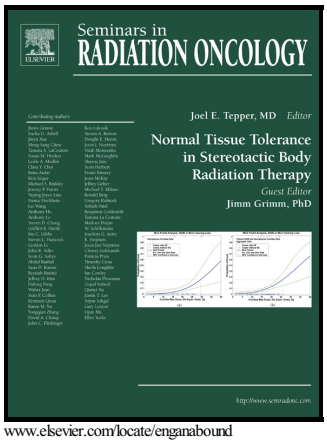

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Advances in Prostate Cancer MRI and PET/CT for Staging and Radiotherapy Treatment Planning

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PII: S1053-4296(16)30040-6
DOI: http://dx.doi.org/10.1016/j.semradonc.2016.08.008
Reference: YSRAO50568

To appear in: *Seminars in Radiation Oncology*

Cite this article as: Drew Moghanaki, Baris Turkbey, Neha Vapiwala, Behfar Ehdaie, Steven J. Frank, Patrick W. McLaughlin and Mukesh Harisinghani, Advances in Prostate Cancer MRI and PET/CT for Staging and Radiotherapy Treatment Planning, *Seminars in Radiation Oncology,* http://dx.doi.org/10.1016/j.semradonc.2016.08.008

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ABSTRACT

Conventional prostate cancer staging strategies have limited accuracy to define the location, grade, and burden of disease. Evaluations have historically relied upon prostate specific antigen levels, digital rectal examinations, random systematic biopsies, computed tomography, pelvic lymphadenectomy, and/or ^{99m}Tc-MDP bone scans. Today, risk-stratification tools incorporate these data in a weighted format to guide management. However, the limitations and potential consequences of their uncertainties are well-known. Inaccurate information may contribute to under-staging and under-treatment, or over-staging and over-treatment. Meanwhile, advances in multi-parametric MRI, whole body MRI, lymphotropic-nanoparticle MRI, and positron emission tomography are now available to improve the accuracy of risk stratification to facilitate more informed medical decisions. They also guide radiation oncologists to develop more accurate treatment plans. This review provides a primer to incorporate these advances into routine clinical workflow.

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