

## Letter From the Editors



The diagnosis and treatment of prostate cancer are complex, rapidly, and continuously evolving subjects. The number of available therapeutic options is increasing and the number and variety of health professionals dealing with the management of prostate cancer patients is expanding. When the number of caregivers around the patient increases, the potential for miscommunication, poor coordination, and fragmentation of services may rise. The approach using multidisciplinary team meetings (MDTs) is intended to tackle this challenge. The purpose of MDT meetings is to develop a strategic plan of treatment and follow-up and to discuss the overall care of an individual patient. Multidisciplinary tumor boards have been advocated as standard of care in modern oncology including prostate cancer, and MDT practice now is well established in many countries.<sup>1</sup> Several studies have investigated the impact of MDT work and/or multidisciplinary clinics, and results have generally indicated that MDTs are associated with changes in staging and/or diagnosis, initial management plans, higher rates of treatment, shorter time to treatment after diagnosis, better survival, and adherence to clinical guidelines.<sup>2</sup>

The November 2016 Issue of the Seminars was dedicated to prostate cancer.<sup>3-8</sup> However, imaging and therapy of prostate cancer are rapidly expanding fields, with many recent developments. Thus, we have decided to dedicate this issue to prostate cancer with a multidisciplinary approach. In February 2018, the first EANM Focus Meeting took place in Valencia, Spain, with focus on “Molecular Imaging and theranostics in prostate cancer.” A multidisciplinary group of experts at the Meeting, and opinion leaders from all over the world presented state-of-the-art lectures and participated in consensus panels. The large faculty included oncologists, urologists, radiologists, specialists in nuclear medicine, radiochemists, and basic scientists. A consensus report based on the conference results has been published.<sup>9</sup> This issue contains selected *highlights* from the meeting. Two papers also are included in this issue with topics that were not covered at the meeting; one paper presents an update of important pitfalls in prostate specific membrane antigen (PSMA) PET of prostate cancer imaging and the other an overview of new targets for molecular imaging in prostate cancer.

*Fanti, Oyen et al.*, discuss the role of molecular imaging and theranostic concepts from a multidisciplinary point of view, summarizing currently available data and how to implement nuclear medicine techniques for diagnosis and treatment of prostate cancer.<sup>10</sup> They describe how, an MDT approach to prostate cancer care guarantees a higher probability for the prostate cancer patient to receive adequate care including all possible diagnostic and therapeutic strategies, balancing advantages and related side effects.

In the recent years, PSMA has become one of the most promising targets in nuclear medicine. Due to PSMA overexpression on prostate cancer cells in proportion to the stage and grade of tumor progression, especially in androgen-independent, advanced and metastatic disease, a large number of tracers for the detection and treatment of prostate cancer by means of radioligand imaging, radioligand therapy, or radioguided surgery have been developed and transferred to clinical routine. *Wester and Schottelius* give a comprehensive overview over the specific characteristics of those radiopharmaceuticals that already have found widespread clinical application.<sup>11</sup> In addition, recently introduced concepts such as PSMA tracers with increased plasma protein binding, are discussed.

*Herrmann et al.* focus on molecular imaging for primary staging of prostate cancer.<sup>12</sup> Accurate staging of primary prostate cancer is important for selection of therapy (local vs systemic). The authors address the current clinical standard, the areas of unmet clinical need for imaging and then summarizes the most commonly used molecular imaging probes for primary staging. Finally, they predict the near future role of molecular imaging in primary staging of prostate cancer. More studies are expected to investigate PSMA based agents with <sup>18</sup>F due to its favorable characteristics such as longer half-life, higher production yields, and nonrenal excretion compared to <sup>68</sup>Ga-PSMA agents.

Molecular imaging of recurrent and metastatic prostate cancer is reviewed by *Hicks et al.*<sup>13</sup> While a wide array of agents is available, the clinical role of broad classes of agents is reviewed. The focus is on molecular imaging agents that have progressed beyond the preclinical stage with sufficient published data to warrant reasonable judgments of their clinical relevance of patients with recurrent or advanced metastatic prostate cancer.

The role of radiological imaging modalities in staging prostate cancer is continuously evolving, and a wide array of radiological imaging modalities including ultrasound, computed tomography, and magnetic resonance imaging have been used for prostate cancer staging with variable diagnostic success. Vargas *et al.* give the readers an insight into the various ways radiology contributes to staging of prostate cancer in the context of both primary staging and post-treatment assessment.<sup>14</sup> The strengths and limitations of each imaging modality are highlighted as well as topics that warrant future research.

When evaluating PSMA PET/CT scans it is important to be aware of pitfalls. Rowe *et al.* discuss the spectrum of benign and malignant nonprostatic PSMA-avid lesions, common sources of false positive and false negative PSMA-targeted PET imaging, and the effect of androgen deprivation therapy on PSMA expression.<sup>15</sup> Furthermore, the authors briefly review the recently proposed structured reporting systems for the standardized interpretation of PSMA-targeted PET.

The mainstay of treatment in metastatic prostate cancer has been based on hormonal manipulations for many years. Standard androgen deprivation therapy and novel androgen axis drugs are commonly well tolerable and can stabilize metastatic hormone-sensitive prostate cancers for years. However, metastatic castration-resistant prostate cancer is still challenging to treat. PSMA is an attractive target for imaging and therapy with radionuclides leading to the first studies with PSMA radionuclide therapy. Giesel *et al.* offer an update on these promising PSMA therapy trials.<sup>16</sup> Early clinical studies demonstrate that regarding biomarkers, PSMA-therapy exceeds the antitumor activity of all approved or other recently tested compounds. Also, progression free and overall survivals of these studies appear promising. However, as stated by the authors, further studies are needed to optimize, improve, and evaluate PSMA radionuclide therapy of prostate cancer patients.

Many PET agents have been developed to staging of prostate cancer in the recent years. Choyke *et al.* provide an overview on advances in novel PET agents that have resulted in identification of small foci of prostate cancer, particularly in the setting of early biochemical recurrence, greatly surpassing the limitations of traditional morphological imaging.<sup>17</sup> To date, PSMA-based PET agents have proved to have higher sensitivity than any other previously tested PET agent for localizing the site of recurrence in the setting of biochemical recurrence of prostate cancer. With these encouraging results, the PSMA-based radiolabeled agents are likely to become universally available in clinical practice for imaging prostate cancer patients in the near future.

The future of prostate cancer patients depends on a successful multidisciplinary collaboration between experienced physicians of all relevant disciplines, which should lead to important advantages in all the phases and aspects of prostate cancer management. This issue contains a selection of important clinically relevant reviews written by experts in the field, and we would like to thank all of the contributors of this issue for sharing their knowledge with the readers of *Seminars in Nuclear Medicine*.

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