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# Letter From the Guest Editor


Greetings! It has been a true pleasure and honor to serve as Guest Editor for this issue of *Seminars in Ultrasound, CT, and MRI*. I would like to thank Dr. Swartz for the kind invitation and faith in me to oversee the development, authoring, and editing of this issue. To the wonderful team of expert authors that worked so diligently putting together this issue, I offer you my greatest thanks and appreciation for a job well done!

This issue focuses on *Positron Emission Tomography (PET) Imaging of the Head and Neck*. We have put together a collection of six fantastic articles written by renowned educators and experienced members of the head & neck and nuclear medicine imaging communities, which cover several key topics of interest for head and neck imagers. It would be an understatement to claim that PET imaging has revolutionized the practice of modern oncologic imaging. Allowing us to move beyond traditional structural imaging, PET affords us the power to investigate at a cellular and even molecular level, granting us the ability to gain critical insights into human physiologic and pathologic conditions. Coupled with CT and, more recently, hybrid MR systems, we are able to marry the physiologic data of PET with the exquisite anatomic imaging of CT and MRI, allowing for more sensitive and accurate detection and staging of malignancies in the head and neck.

In *Normal Patterns and Pitfalls of FDG Uptake in the Head and Neck*, my colleague Dr. Benjamin Gray and I provide an image-rich review of the normal patterns of $^{18}$F-FDG uptake in the head and neck. We also illustrate key concepts in differentiating benign from malignant etiologies of incidentally found FDG-avid foci on head and neck imaging, as well as detail important "don't miss" hypometabolic head and neck lesions on PET/CT and PET/MRI. I think you will find this overview a relevant starting off point before diving deeper into the current clinical applications of PET imaging in the head and neck.

In *PET/MRI versus PET/CT in Head and Neck Imaging: When, Why, and How?*, my nuclear medicine colleagues at the Indiana University Department of Radiology and Imaging Sciences (Drs. Joshua Ryan, Vasantha Aaron, and Justin Sims) address the big questions associated with hybrid PET/MRI, a powerful new tool in head and neck oncologic imaging. While not yet widely available, hybrid PET/MRI systems possess several attributes that may make it a superior modality to PET/CT for certain indications. This review discusses the established role of PET/CT, early evidence for the role of PET/MRI, and protocol considerations for both PET/CT and PET/MRI as they apply to head and neck imaging.

Due to the complex embryology, physiology, and FDG uptake of the salivary glands, tumors and tumor-like lesions of the major and minor salivary glands can sometimes prove challenging for head and neck imagers. In *FDG-PET Imaging of Salivary Gland Tumors*, Drs. Cody Larson and Richard Wiggins, III from the University of Utah Department of Radiology and Imaging Sciences provide a practical guide for PET imaging of tumors and tumor-like lesions of the salivary glands. They also detail important diagnostic considerations, such as perineural tumor spread and intraparotid nodal metastatic disease or lymphoid malignancy, which are unique subsets related to salivary gland malignancy.

Squamous cell carcinoma is the most common malignancy to arise in the head and neck; therefore, it is imperative that head and neck imagers be familiar with the roles of PET/CT and PET/MRI for the diagnosis, initial staging, and monitoring of treatment response in patients with squamous cell carcinoma. In *Squamous Cell Carcinoma: PET/CT and PET/MRI of the Pre-Treatment and Post-Treatment Neck*, Dr. Katie Traylor from the University of Pittsburgh Department of Radiology, Dr. Kristine Mosier from the Indiana University Department of Radiology and Imaging Sciences, and I detail the vital role of FDG-PET/CT and FDG-PET/MRI in the evaluation of squamous cell carcinoma at the different head and neck subsites. We highlight the significance of these imaging modalities in identifying the primary tumor extent, regional nodal metastases, and distant metastatic disease in the pre-treatment and post-treatment settings, as well as report implications for staging, treatment, and prognosis.

On occasion, patients present with evident nodal metastatic disease in the neck or distant metastases of head and neck origin, but no clear primary malignancy on conventional CT, MRI, or ultrasound. Traditionally, evaluation of these patients has relied on invasive procedures, such as panendoscopy with targeted biopsies, tonsillectomies, and tongue base mucosectomy, but the workup of these patients has been revolutionized by the widespread availability of PET/CT over the past decade. In *PET/CT Evaluation of Head and Neck Cancer of Unknown Primary*, colleagues from the Departments of Radiology (Drs. Megan Albertson and Craig Johnson), Oral/Maxillofacial Surgery (Dr. Srinivasa Chandra), and Otolaryngology-Head and Neck Surgery (Dr. Zafar Sayed) at the University of Nebraska Medical Center detail the central role that PET/CT now plays in the

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workup of patients with carcinoma of unknown primary in the head and neck (HNCUP).

Last, but certainly not least, Dr. Laura Eisenmenger from the University of Wisconsin Department of Radiology provides a fascinating look into the future of PET imaging of the head and neck. In her article *Non-FDG Radiopharmaceuticals in Head and Neck PET Imaging: Current Topics and Future Directions*, Dr. Eisenmenger details the potential roles of multiple emerging non-FDG radiotracers for head and neck imaging. These novel radiotracers hold promise as tools to better image certain head and neck malignancies or to better delineate treatment effects from disease recurrence in patients with head and neck cancer.

With the widespread availability of PET/CT, an increasing role of PET/MRI in clinical practice, and the development of novel radiotracers beyond $^{18}$F-FDG, now is a very exciting time to practice head and neck oncologic imaging! Keeping the rapidly changing environment of PET and molecular imaging in mind, I have curated this selection of articles to address many cutting edge topics in PET imaging of the head and neck, while maintaining a practical approach for clinical imagers. I truly hope that you will find these articles to be both interesting and useful for your practice!

Best regards,

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