



Mini Course Session 1

Technologists Committee

Wednesday, October 8, 08:00 – 09:00

Session Title

Nuclear Medicine Applications for Radiotherapy Planning

Chairpersons

Andrea Santos (Lisbon, Portugal)

Angelo Cardoso (Bern, Switzerland)

Programme

- 08:00 – 08:20 **Valentina Mautone** (Meldola, Italy): The Nuclear Medicine Technologist's Expertise: Optimizing PET/CT Acquisition and Processing for Radiation Therapy
- 08:20 – 08:40 **Yat Tsang** (Toronto, Canada): From Image to Treatment Plan: The Radiation Therapist's Approach to Integrating PET/CT in Radiation Therapy
- 08:40 – 09:00 **Valentina Mautone** (Meldola, Italy) **and Yat Tsang** (Toronto, Canada): Collaborative Approaches in Radiotheranostics: Bridging Nuclear Medicine and Radiation Therapy Expertise

Educational Objectives

By the end of this session, participants will be able to

1. Implement advanced PET/CT acquisition protocols specifically designed by Nuclear Medicine Technologists to enhance target delineation in radiation therapy planning.
2. Demonstrate technologist-specific quality control procedures that ensure quantitative accuracy of SUV measurements critical for radiation therapy decisions.
3. Troubleshoot common technical artifacts in PET/CT imaging from the Nuclear Medicine Technologist's perspective, ensuring optimal image quality for treatment planning.
4. Utilize radiation therapist-developed workflows for translating PET/CT diagnostic positioning to reproducible treatment setup positions.
5. Perform accurate image registration techniques between PET/CT datasets and planning CT scans using radiation therapy planning systems.
6. Differentiate between various PET-based target volume delineation methods and their impact on treatment margins from a radiation therapist's clinical perspective.
7. Establish effective interdisciplinary workflows where Nuclear Medicine Technologists and Radiation Therapists collaborate to optimize radiotheranostic patient management.
8. Develop joint quality assurance protocols that leverage the unique skills of both professionals to ensure accurate dosimetry and treatment response assessment.
9. Design comprehensive patient care pathways that utilize the distinct yet complementary roles of Nuclear Medicine Technologists and Radiation Therapists throughout the radiotheranostic treatment journey.

**Summary**

This interdisciplinary session brought together Nuclear Medicine Technologists and Radiation Therapists to explore collaborative approaches in enhancing radiotheranostic patient care. The session emphasized advanced PET/CT acquisition protocols tailored by technologists to improve target delineation in radiation therapy planning. Participants examined technologist-driven quality control procedures essential for ensuring SUV measurement accuracy and discussed strategies for identifying and troubleshooting PET/CT artifacts to optimize image quality. Radiation Therapists shared specialized workflows that support reproducible treatment setups based on diagnostic PET/CT positioning. Attendees were trained in precise image registration techniques between PET/CT and planning CT datasets, and evaluated various PET-based target delineation methods, considering their implications on treatment margins.

A central theme of the session was the integration of professional expertise to streamline workflows. Participants developed joint quality assurance protocols and designed collaborative care pathways, highlighting the complementary roles of technologists and therapists in achieving accurate dosimetry and monitoring treatment response. The session concluded with strategies to enhance interdisciplinary communication and coordination across the radiotheranostic continuum.

Key Words

Nuclear Medicine; Radiation Therapy Planning; Radiotheranostic