



Mini Course 2

Technologists Committee + Physics Committee

Wednesday, October 21, 09:05–10:05

Session Title

Instrumentation and Dosimetry

Chairpersons

Ângelo Cardoso (Bern, Switzerland)

Laetitia Imbert (Nancy, France)

Programme

- 09:05–09:25 **Christian Vanhove** (Ghent, Belgium): From Detector to Image: Understanding Nuclear Medicine Instrumentation
- 09:25–09:45 **Mette Stam** (Leiden, Netherlands): Radiation Dose in Nuclear Medicine: Principles and Practical Dosimetry
- 09:45–10:05 **Valentina Mautone** (Meldola, Italy): Dose Optimisation and Radiation Safety: The Technologist's Role

Educational Objectives

1. Describe the fundamental principles of nuclear medicine instrumentation, including the operation of gamma cameras, SPECT, and PET systems.
2. Explain key concepts in radiation dosimetry, including absorbed dose, effective dose, and factors influencing dose in clinical practice.
3. Apply dosimetry principles to routine workflows, supporting safe radiopharmaceutical handling, administration, and imaging procedures.
4. Identify methods to optimise image quality by adjusting acquisition parameters, detector settings, and reconstruction techniques while adhering to the ALARA principle.
5. Recognise the technologist's role in radiation protection, including strategies to minimise exposure for both patients and staff.
6. Implement practical dose management strategies in clinical scenarios, balancing diagnostic accuracy with radiation safety requirements.

Summary

This session provides a practical foundation in nuclear medicine, focusing on the essential principles that underpin safe and effective clinical practice. Participants will review the fundamentals of instrumentation, including gamma cameras, SPECT, and PET systems, and how these technologies influence image acquisition and quality.

Core concepts of radiation dosimetry will be discussed with an emphasis on their application in everyday workflows. The session will highlight strategies to optimise image quality while maintaining radiation safety in accordance with the ALARA principle.

Special attention will be given to the critical role of the technologist in managing patient and staff exposure, ensuring protocol adherence, and contributing to a culture of safety. Through practical examples, attendees will gain actionable knowledge to enhance both image quality and radiation protection in routine nuclear medicine practice.



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Key Words

SPECT; PET; Radiation Dosimetry; ALARA Principle; Nuclear Medicine instrumentation.