

# NUCLEAR MEDICINE INTERNAL DOSIMETRY: MEASUREMENTS, MODELS, AND METHODS

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**D**ose estimates for radiopharmaceuticals may be established based on data from preclinical (i.e. animal species) or clinical studies (involving human patients or volunteers). This session will describe current approaches in both areas, and show examples. Traditional mathematical model-based anatomical models have now been replaced with more realistic standardized anatomical models based on patient image data and have been incorporated into the software code OLINDA/EXM 2.0. The code employs these anthropomorphic models, the new International Commission on Radiological Protection (ICRP) human alimentary tract (HAT) model and updated (ICRP 103) tissue weighting factors for calculation of effective dose. Adjustments to traditional dose calculations based on patient specific measurements are routinely needed, especially in therapy calculations, for marrow activity (based on measured blood parameters or image data), organ mass (based on volumes measured by ultrasound or computed tomography (CT), and other variables. Many interesting radiopharmaceutical therapy agents are currently in use, for thyroid disorders, neuroendocrine tumours, and treatment of bone metastases. Clinical experience, success rates, and management of normal tissue toxicity with many nuclear medicine therapy agents will be reviewed. The need for patient individualized approaches to therapy will be emphasized. A discussion of relevant release criteria for therapy patients will be included.

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