Dose Optimisation: A European Perspective

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In the EU council directive 97/43/EURATOM (June 1997), the establishment of a system of reference activities for the major diagnostic procedures has been included. Most of these nuclear medicine procedures, however, are done on an ad-hoc basis; the administered activities vary from country to country. This fact is reflected in the European Association of Nuclear Medicine (EANM) guidelines for diagnostic procedures, in which most of the administered activities vary within a certain range. These issues highlight the need for optimisation of the administered activity in Nuclear Medicine diagnostics.

Since the introduction of hybrid imaging systems such as PET/CT and SPECT/CT, the use of these CT images may increase the patient dose considerably, especially if no CT dose optimisation is carried out. Systematic implementation of low-dose CT settings is of particular importance in paediatric nuclear medicine.

Examples for recommendations for dosage optimisation for PET studies are given in the EANM procedure guidelines for tumour PET imaging [1].

For paediatric nuclear medicine, in 2007 an EANM paediatric dosage card was published by Lassmann et al [2, 3] in which the activity for a given radiopharmaceutical is given as a function of body weight. For activity calculation an on-line dosage calculator and an application for the iPhone are available (http://www.eanm.org/publications/dosage_calculator.php?navId=285). For DMSA scintigraphy in paediatric patients an optimisation procedure based on patient risk estimates is provided by Sgouros et al. [4].

In 2011 Gelfand et al. published a North American consensus guideline to standardise the administered activity in paediatric nuclear medicine in North America [5]. Both cards (EANM and the North American) do not differ much in the recommended activities to administer. Efforts to harmonise these two dosage recommendations are presently underway.

References