PET Protocol Optimisation for Dose Reduction

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Dose reduction and protocol standardisation in Nuclear Medicine and in all diagnostic procedure is a highly discussed topic in all the world. Medical and physic science literature is increasing year by year on the topic. Following a high push from government and public opinion, many institution are devoting funds and energy to improve daily practice in diagnostic procedure not only to obtain better images, but also to reduce patients and staff exposition to ionising radiations.

EANM is a world leading societies in Nuclear Medicine and put many efforts on these topics. The idea is not only to develop guidelines on how to reduce patient exposition in Nuclear Medicine, but also to improve accuracy and appropriateness of diagnostic methods, to compete other diagnostic tools that offers less patient exposition to radiations.

With the significative actual presence in diagnosis and clinical practice of the hybrid imaging system PET-CT, challenges arose for NM staff to be able to optimize scanning protocols and image acquisition, but respecting the general criteria of dose optimisation. It really important to be aware of basic ALARA principles that drives dose optimization in Nuclear Medicine in Europe. Every modern guidelines on PET-CT focus on some specific aspects of dose reduction.

PET-CT showed to be a great instrument for quantitative assessment of surrogate markers in neoplastic lesion, leading to many application in clinical trials. With this concepts in mind, EANM started the project of EARL Accreditation of PET Scanners for clinical trials. The aim of the project is to standardize image acquisition with different scanner for more accurate multicentre quantitative evaluation of PET findings. A not secondary effect of standardisation is to address technical advancement of scanners not only in improving image quality but also in administered activity reduction.

EANM also created dedicated project of dose optimization for pediatric patients, like Peddose and PediatricDosage card that will be discussed in the review.

EANMTC Consider Nuclear Medicine Technologists involvement in Protocols Standardisation fundamental for Dose Optimization in NM daily practice.

This lecture wants not only to be a lesson but also a confront with different national realities and problems. Questions are welcome and could lead to further research on this fundamental topic.

Suggested readings:

1 Boellaard R, Delgado-Bolton R. FDG PET/CT: EANM procedure guidelines for tumour imaging: version 2.0 Eur J Nucl Med Mol Imaging (2015) 42:328–354

2 Stauss J, Franzius C et al. Guidelines for 18F-FDG PET and PET-CT imaging in paediatric oncology. EANM 2008

3 Lassmann M, Biassoni L, Monsieurs M, Franzius C, Jacobs F. EANM Dosimetry and Paediatrics Committees. The new EANM paediatric dosage card. Eur J Nucl Med Mol Imaging 2007;34:796–8.

4 Lassmann M, Biassoni L, Monsieurs M, Franzius C. The new EANM Paediatric Dosage Card. Additional notes with respect to F-18. Eur J Nucl Med Mol Imaging 2008;