

Pediatric Nephrology: What Do We Do with Infants?

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Nuclear medicine technologist (NMT) has a central position in everyday work in a nuclear medicine department which is based on application of radiopharmaceuticals (RF) for diagnosis and therapy. It is especially so in the diagnostic part, comprising imaging, where NMT is in contact with a patient from the beginning: receiving a request from the referring clinician, checking indication and documentation, transferring it to the NM physician for the approval, then placing an order for a particular procedure, in the same time providing to the patient detailed information about the procedure, and how to prepare himself for it. On the day of imaging, NMT is preparing and labeling the RF, usually introducing it into the patient as well (most often intravenously), and then conducting the whole imaging procedure according to the written protocol. Upon termination of acquisition, after checking obtained files and images for technical accuracy, NMT is reporting it to the physician. Finally, NMT is dismissing the patient and advising him when the finding will be completed and ready for taking over. So, only if all these steps are properly performed by NMT, NM physician can start with further analysis and make opinion based on the imaging procedure (and other patient's data).

How does it look when the patients are children?

Of course, it is more complicated. First, in all steps one or both parents must be involved and NMT is therefore dealing with at least two persons- the child and a parent. Second, before the imaging, child should be gently and delicately prepared (often the parents as well!) for the application of RF, mainly by an injection. Finally, during the imaging, which can sometimes last up to 45 min, the child should be kept in the permanent position in relation to camera, ideally without movement.

EANM Paediatric Task Group states that a human approach is preferred to any drug sedation, promoting it as a part of the good practice of the paediatric nuclear medicine.

Whoever has worked with toddlers and has attempted to achieve all these prerequisites for successful imaging is aware how difficult and delicate task is it. But not impossible.

A good team is capable of resolving these challenges in more than 99% of patients, and it is happening all the time in NM departments all over the world.

Paediatric nephro-urologic imaging, particularly renal dynamic scintigraphy, represent more than 60-70% of the daily activity in paediatric nuclear medicine, owing mainly to the antenatal detection of hydronephrosis and the high frequency of pyelonephritis in first several years of life.

A brief overview of RF used in renal investigations will be given, with emphasis on MAG3 dynamic scintigraphy and its variants (diuretic scintigraphy, indirect voiding cystourography). Existing specific paediatric guidelines will be mentioned, as well as EANM dosimetry card, with aim to show the importance of ALARA approach and radiation dose reduction in children.

Clinical cases will be presented and value of follow up in paediatric population. Pitfalls and problems with which NMTs are faced in everyday work with small children are discussed, and clues for solving the difficulties are suggested.

Suggested readings:

- (1) EANM: Competencies for the European Nuclear Medicine Technologist – 1998
- (2) Nuclear medicine: Fusing the Ideas of Democritus and Hippocrates, 25 years of EANM, Editor EANM, ISBN: 978 3 902 785 08-4
- (3) <http://www.esopnm.net/9esopnm/index.htm> (EUROPEAN SYMPOSIUM ON PAEDIATRIC NUCLEAR MEDICINE, under the auspices of PAEDIATRIC COMMITTEE OF THE EUROPEAN ASSOCIATION OF NUCLEAR MEDICINE)
- (4) <http://www.eanm.org/publications/guidelines/paediatrics/>