Overview of radiation protection issues

H. Medvedec, Zagreb (HR)

Over the past few years radiation protection issues and recommendations were making a part of practically every continuing technologist education session at the annual EANM Congress. For example, last year in Barcelona it was specially included in CTE "Quality control in nuclear medicine". Two years ago, in Munich we were hearing a great part of its importance in CTE "Discussion of basic question and standards in daily practice and aspects of risk management" as well as in CTE "Radiation protection of workers at the imaging modalities SPECT/CT and PET/CT". Three years ago, in Copenhagen, Technologist Committee organized a session "PET/CT Radiation Safety Considerations". In 2006 (Athens) attendees could learn about radiation protection when performing advanced therapy. In 2005 (Istanbul) there was a special session designed about radiation risks in pregnancy for staff working in nuclear medicine.

Radiation protection makes major part in technologist booklet "Best practice in Nuclear Medicine" – Part 2, published in 2007.

In this Mini-course we will remind you of important radiation protection rules and basic concepts of radiation protection. A presentation will be made about operational risks and measures to minimize radiation exposure to nuclear medicine staff, other health professionals and members of the public. We will mention radiation warning symbols and radiation health effects. Establishment of good radiation safety practice in Nuclear Medicine department depends very much on good communication with the patients and other hospital staff. In diagnostic studies questions are often asked about hazards from patients receiving diagnostic doses. Patients themselves are very often worried about radiation side effects, about the potential harm from the pharmaceuticals as well as risks of administering them to pregnant women.

Some sources of exposure are excluded from consideration if they are not amenable to control, for example natural sources of radiation. Some members of the working population are more or less regularly exposed to radiation through their occupation. The doses received by users of radiation in medicine vary a great deal and are often characterized by a non-uniform distribution in the body. The control of doses in nuclear medicine normally involves providing protection against ingestion or inhalation during radiopharmaceutical production, analysis and administration. There can also be external exposure, as in the case of 99mTc, which can deliver substantial doses at very high dose rates to the hands of the operator of the generator producing the radionuclide if no protection is provided.There are also contamination issues regarding patient excretions. Procedures must be followed on discovery of a contamination problem and decontamination in generally must have regard for the radioisotope form and type of contamination. After therapy procedures staff caring for patients may be required to follow safe working practices.

This Mini-course will discuss some dosimetry calculations and suggest appropriate explanations to be given in regard to minimize fear of possible high doses received during Nuclear Medicine clinical studies.