is preparing an update of Radiation Dose to Patients from Radiopharmaceuticals, and Working Parties are preparing drafts for Diagnostic Reference Levels for Diagnostic and Interventional Imaging, and Radiological Protection in Therapy with Radiopharmaceuticals. In October 2015, the 3rd ICRP symposium and meeting was held and current progresses was discussed and updated in Seoul, Korea.

## Current Issues 2

### Diagnostic Reference Levels in Nuclear Medicine Imaging

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Medical exposure remained by far the largest artificial sources of exposure and continues to grow significantly. The basic principle of radiological protection of patients in diagnostic and interventional x-ray procedures and nuclear medicine imaging is that necessary diagnostic information of a clinically satisfactory quality should be obtained at the expense of a dose as low as reasonably achievable, taking account of social and economic factors. The basic principles of radiation protection recommended by the International Commission on Radiological Protection (ICRP) are justification, optimisation and dose limitation. The basic aim of this optimisation of protection is to adjust the protection measures for a source of radiation in such a way that the net benefit is maximised. In the case of exposure from diagnostic and interventional medical procedures, the diagnostic reference levels (DRLs) has as its objective the optimisation of protection. The concept of DRLs was introduced by ICRP Publication 60 in 1990 as a form of investigation level used to identify situations where optimisation of protection may be required in the medical exposure of patients, and the use of DRLs was recommended in ICRP Publication 73 with further guidance in Supporting Guidance 2. The most recent ICRP publications 103 and 105 summarise previous definitions and recommendations about DRLs. The objective of DRLs is to help avoid radiation dose to the patient that does not contribute to the clinical purpose of a medical imaging task. DRLs can be used to improve a regional, national, or local distribution of observed results for a general medical imaging task, by reducing the frequency of unjustified high or low values, and to promote attainment of a narrower range of values that represent good practice for a more specific medical imaging task and to promote attainment of an optimum range of values for a specified medical imaging protocol. DRLs are not intended for individual patients and are not dose limits. DRLs should be based on clinical practice. Image quality must not be neglected. For nuclear medicine, DRLs are established in terms of the administered activity per kg body weight of a specific radionuclide for a specific clinical task and, if relevant, the radiopharmaceutical used, and the administered activity should be adjusted for patient weight for examinations where the radiopharmaceutical is distributed throughout the body. DRLs for nuclear medicine imaging procedures may include both minimum and maximum activities. DRLs have proven to be an effective tool for optimisation of radiological protection in the medical exposure of patients. Professional medical bodies in conjunction with national health and radiological protection authorities are encouraged to set DRLs that best meet their specific needs and that are consistent for the national area to which they apply.

## Current Issues 2

### Estimation of External Radiation Dose to Caregivers during Radionuclide Therapy

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Due to the remarkable increase in thyroid cancer cases, the number of patients treated with radioiodine (I-131) shows a sharply increasing trend in recent years. Accordingly, radiation exposure of other people, particularly caregivers or comforters, after release of patients from hospitals is getting more attention than ever. In the talk estimation of doses to caregivers and appropriate quarantine periods will be discussed. To reflect the degree of engagement between the caregiver and the patient, considering the duration and distance between two during exposure, the engagement factor has been introduced. The speaker will discuss how to estimate the engagement factor. The pattern of patient care and timing of exposure will also be discussed for a few patient cases.

## Current Issues 2

### Education and Training for the Radiation Safety Related to the Radiopharmaceutical

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**Objectives:** The importance of education and training for the radiation safety related to the radiopharmaceuticals became a need in all area of production and application of radiopharmaceuticals, for clinical and research purpose. To create the educational program and training that include application of International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) together with Good Radiopharmaceutical Practice is one of general starting point to cover all the aspect of the application of radiopharmaceuticals for diagnostic, both SPECT and PET and therapeutical purpose for all practices and interventions.

**Methods:** To establish the program of education and training for Good Radiation Safety Practice related to the usage of radiopharmaceuticals is important tool for all individuals working with radiopharmaceuticals. They have a responsibility to take all reasonable precautions to protect patients; to protect members of the general public; to protect their colleagues; and most importantly to protect themselves from unnecessary exposure to ionizing radiation.

Education and suitable training that include regular and continuing education as an formal and not formal approach in: Design and construction of facilitieas of production and application of radiopharmaceuticals;

Local radiation safety rules and procedures for quality control;Preparedness;Equipment;

Monitoring of the personnel and environment.

**Results:** All types of education and training in national and international level must to ensure that all radiopharmaceutical preparations and administration procedures should be carried under well-defined and controlled conditions. Good housekeeping is important and all work areas should be kept clean and tidy, all radionuclide containers must be safely stored and readily available, adequate supplies of consumables must be available within easy reach of staff performing radiopharmacy work, unnecessary visits to the radiopharmacy should be discouraged and contaminated sharp items such as needles must be safely stored behind shielding.

Regular obligatory records should be kept of: Receipt and disposal of radioactive materials;

All individual preparations for patient administration, including the patient's name, radiopharmaceutical used, activity and date; Quality control testing of the radionuclide calibrator and other instruments

Regular surveys (preferably weekly) of contamination must be performed. A decontamination kit should be held in or near the radiopharmacy.

A sensitive radiation monitor must be available at all times in the radiopharmacy for contamination checking, not only of surfaces, but also ofhands, clothing and disposables.

**Conclusions:** To have well trained competent staff who have the necessary skills and knowledge to deal with radioactive pharmaceutical products must be the goal of each institution involved in production and application of radiopharmaceuticals including its own quality assurance programme to ensure that the products administered to patients are of the desired quality.

This requires to develop an appropriate education and training for the radiation safety related to the radiopharmaceuticals as one of the vital component in the assurance of quality of administrated radiopharmaceuticals.

## Current Issues 2

### Nuclear Medicine Leadership in Radiation Accidents

Sobhan Vinjamuri

Sobhan Vinjamuri, Royal Liverpool University Hospital

Radiation Accidents are becoming an important matter for hospitals and health care service planners. Preparedness for possible accidents is very important, roles and responsibilities of key personnel within health care settings needs to be clearly defined.

In this plenary lecture, I will cover the various roles and responsibilities required for the preparation for radiation accidents and explore the possible role for Nuclear Medicine Professionals to contribute in a leadership capacity.

## Current Issues 3

### Developing a Personalized Model of PRRT Based Upon Molecular Imaging: Will it be a Realistic Approach?

Sandip Basu

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Neuroendocrine tumor (NET) is a widely heterogeneous