#### 1. Objective

To ensure that radiation doses to patients are maintained as low as possible to achieve the image quality or satisfactory test result required for successful clinical diagnosis.

To ensure that activities administered for radionuclide therapy are optimal to achieve successful treatment with a minimal risk of side effects.

##### 2. Responsibilities

The operator has prime responsibility for ensuring that all aspects of a medical exposure are optimised.

Service Leads are responsible for putting procedures and associated Clinical Protocols in place to ensure that all exposures are optimised. These should include a requirement for a review of imaging protocols used at least every two years and whenever any new equipment or procedure is introduced.

Local Managers are responsible for putting procedures in place to provide charts of exposure or administered activity for an appropriate range of examinations.

A Medical Physics Expert (MPE) will contribute to the optimisation of exposures and the application and use of Diagnostic Reference Levels (DRL).

The practitioner in consultation with a suitable MPE is responsible for ensuring that appropriate systems are in place for radionuclide therapy.

###### 3. Employer’s Written Procedures

Procedures and associated Clinical Protocols will identify exposure factors or administered activities that will be used for average patients and indicate modifications to account for heavier or lighter patients.

DRL will be established in accordance with EP11. Exposure charts including DRLs should be prepared for each X-ray room and mobile X-ray unit, or charts of administered activity for each nuclear medicine department, and be readily available to operators performing exposures. These should be reviewed at appropriate intervals to ensure that they are fully optimised.

Special attention should be paid to medical exposures

* of children;
* that are part of a health screening programme;
* that involve high doses to the individual being exposed;
* of patients who are pregnant or for whom pregnancy cannot be excluded;
* and of individuals who are breast feeding (where appropriate)

Specific imaging protocols for children with an appropriate range of ages and/or weights must be provided in departments where paediatric exposures may be undertaken.

A formal procedure should be in place for making and accepting amendments to procedures and Imaging Protocols.

**4. X-ray Exposure Optimisation**

Exposure factors should be set with reference to European and national recommendations and other relevant guidelines.

Service Leads in consultation with MPEs will arrange for the automatic exposure control devices in every X-ray room to be set up in a manner that will maintain the radiation dose to the patient at an acceptable level, while delivering the necessary level of image quality for the clinical task.

Measured doses and dose related parameters should be checked and compared with DRLs whenever practicable.

The Service Lead will make arrangements for periodic local audits on factors such as dose-area product and screening time to be performed and compare values with the DRL, in order to improve operator performance.

Should a Health Physics patient dose survey identify that any dose quantity is approaching the diagnostic reference level (DRL), then the Service Lead should take account of any recommendations made in order to reduce the radiation dose below the DRL. This should be done in consultation with a diagnostic radiology MPE.

There should be a system of recording exposure factors in place for all patient exposures in order to allow any unusual doses to be identified and investigated.

**5. Nuclear Medicine Optimisation**

Administered activities for each type of diagnostic examination should be set with reference to the Notes for Guidance issued by the Administration of Radioactive Substances Advisory Committee (ARSAC).

Any increase in administered activity above the DRL must be performed in accordance with the Notes for Guidance issued by the Administration of Radioactive Substances Advisory Committee (ARSAC).

Administered activities for each therapeutic treatment should be prescribed by the referrer and justified by the IRMER practitioner to provide optimal treatment response. Activities should be checked by the entitled operators.

The practitioner for any radionuclide therapy ensures that systems are in place to stop and start the patient’s medication in accordance with the protocol for the therapy procedure.

Where appropriate, written instructions and information setting out the risks associated with the exposure and specifying how doses resulting from the patients exposure can be restricted will be provided to the patient, parent or appropriate person in accordance with EP-6