1. Objectives

To ensure that information relevant to the radiation dose delivered to each patient undergoing a medical exposure is collected and recorded. The appropriate dose parameters are recorded on either the RIS system, within the DICOM header of images or with the patient record if RIS/PACS is not used. The information recorded shall be sufficient to ensure that an assessment of effective dose relating to each patient can be carried out.

2. Responsibilities

The Service Lead (SL) shall authorise a procedure for their Service that defines how patient doses shall be measured and recorded for medical exposures.

The SL will ensure procedures and follow up are in place for investigation and action to be taken when doses exceed a threshold trigger level above which tissue effects may occur.

The Head of Health Physics will ensure that there is a rolling programme for carrying out patient dose surveys for diagnostic radiology examinations.

The Head of Nuclear Medicine will ensure that there is a rolling programme for carrying out patient dose surveys for Nuclear Medicine (NM) and any associated CT.

The appropriate Medical Physics Expert (MPE) for each hospital will ensure that survey results are compared with relevant Diagnostic Reference Levels (DRLs) and actions recommended to address any deficiencies. The MPE will also advise on patient dosimetry.

3. Patient dose assessments

The data recorded for each medical exposure should include those items listed below. This should provide sufficient data to enable an assessment of effective dose for a reference patient to be made.

The Service Lead with responsibility for the relevant units must ensure that data collection for dose surveys is completed in a timely manner and data returned to the relevant MPE.

A representative dose assessment should apply to an average adult patient. Where possible data for large numbers of patients will be used to avoid weight restrictions although outlier values will still be excluded. Assessments will also be undertaken for paediatric patients and grouped according to weight or age.

The relevant MPE will compare average doses for each type of examination with the relevant DRL, and prepare reports of dose survey results that will identify whether any of the dose levels measured either approach or exceed the DRLs. These reports will be considered by the relevant Image Optimisation Team (IOT).

Where high dose X-ray examinations are performed there is a process for recording and investigating cases where doses exceed a threshold trigger level above which deterministic effects could occur. The trigger level is based on skin dose or DAP for interventional and cardiac procedures, DLP for CT scanning and DAP for other modalities. Where available dose mapping systems would be used.

Where high dose NM examinations are performed there is a process for recording and investigating cases where unintended doses exceed a threshold trigger level above which deterministic effects could occur. The trigger level is based on skin dose.

Department procedures for high dose examinations include a process for the clinical follow-up of cases where the patient has received a dose that could lead to potential tissue reactions. As part of the consent process the operator discusses the benefit and risks of the exposure.

4. Information recorded for each procedure

All equipment producing ionising radiation, installed on or after Feb 2018, is required to be able to inform operators of the patient dose in terms of relevant dose indicators such DAP or DLP. Where appropriate, such equipment will have the capability to transfer this information to the patient's exposure record. All interventional radiology and CT equipment installed after Feb 2018 has a means of informing the operator, post exposure, of the amount of radiation produced during the examination.

The information for each procedure should include the following which should be recorded on RIS or where RIS in not available within the patient record:

Radiography

- All examinations including all projections used
- Total dose-area product and dose units for the individual examination where possible
- Number of exposures
- If there is no DAP data, the kV and mAs must be recorded.

Mammography

- kV and mAs
- Compressed breast thickness
- Anode/Target filter combination
- Displayed Mean Glandular Dose

Dental

- Teeth imaged or selected exposure settings
- Patient size setting
- Dose Area Product and dose units where available

Fluoroscopy

- Name of procedure carried out
- Screening time
- Total dose-area product (and dose units) for whole examination including additional exposures

Angiography and Interventional Procedures

- Name of procedure
- Screening Time
- Dose area product and dose units for whole procedure
- Cumulative air kerma (if available)

Computerised Tomography

- Name of examination
- Total Dose-length Product (DLP)
- $CTDI_{vol}$

Bone densitometry

- Names of all examinations performed and DAP dose and units where available

Nuclear Medicine

- The activity administered to the patient
- The radiopharmaceutical administered
- Any attempt to reduce dose (e.g. thyroid blocking)
- For CT as above