

Dental Radiation Protection

Example Employer’s Procedures (2019)

For the Ionising Radiation (Medical Exposure) Regulations 2017

For dental practices where dentists and other dental   
professionals undertake radiographs

*[](http://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0ahUKEwjWjMKIoKzXAhVPkRQKHeZwAV4QjRwIBw&url=http://www.nes.scot.nhs.uk/education-and-training/by-discipline/dentistry/areas-of-education/clinical-effectiveness/scottish-dental-clinical-effectiveness-programme-(sdcep).aspx&psig=AOvVaw1ChRUhL5iLyN_60ZdOVXg7&ust=1510136779522799)*



Example Employer’s Procedures for Dentists and Other Dental Professionals (2019)

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| ***Date*** | ***Author/Reviewer*** | ***Details*** |
| *Oct 2011* | *A. Johnston, Scottish IR(ME)R Inspectorate* |  |
| *Dec 2019* | *The Scottish Dental Clinical Effectiveness Programme (SDCEP) and Health Improvement Scotland (HIS) IRMER Team* | *Reviewed and updated to reflect IR(ME)R 2017 regulations.  Revisions include the addition of new example employer’s procedures (EP16, 17 & 18).* |

Healthcare Improvement Scotland (HIS) enforce the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) in Scotland on behalf of the Scottish Government and have supported the development of these example IR(ME)R Procedures for dental practices.

###### Introduction

The Ionising Radiation (Medical Exposure) Regulations 2017 (IR(ME)R) govern the use of ionising radiation, including x-rays, in healthcare. The purpose of IR(ME)R is to minimise the risk to patients undergoing medical exposures, and a requirement of IR(ME)R is that the Employer puts in place written Employer’s Procedures for Referrers, Practitioners and Operators to ensure that radiation is used safely and appropriately.

This document contains a set of example Employer’s Procedures to adapt for use, for practices where, as well as dentists undertaking their own radiographs, other staff groups such as dental nurses, hygienists or therapists also take radiographs. An alternative set of example Employer’s Procedures for practices where dentists always undertake the dental radiographs for their own patients i.e. where the dentist act as the Referrer, Practitioner and Operator is also available.

The example Employer’s Procedures provided here, and their appendices, are intended as a guide only, to demonstrate the variations and areas of practice which need to be considered when writing IR(ME)R Procedures, and should be regarded as an expression of professional opinion rather than an absolute statement on the legal position. While attempts have been made to ensure they are comprehensive, there will always be local variations which must be taken into account. For example, some sites may use radiographic film and processors to obtain radiographic images whereas other practices will use digital radiography.

The Employer’s Procedures aim to standardise practice and ensure that all duty holders are working to the same standards.

Note that the Employer’s Procedures provided in this document are examples and practices may use alternative documents to meet IR(ME)R requirements. The Employer’s Procedures may also be presented in a different order.

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| How to use the example Employer’s Procedures Practices should adapt and complete the example Employer’s Procedures provided in this document, preceded by the author, version and review details panel (shown on page 1) for document control, and include these in their Radiation Protection File**.** The front cover and introductory pages (i.e. pages i to iv of this document) can be omitted from the practice’s version of the Employer’s Procedures.  **All of the suggested examples and text must be carefully adapted to ensure they match local ownership and practice.**  It is intended that each case of plain red text is considered and either accepted by changing to black font or deleted if not applicable. Where the text is shown in *red italics*, information should be entered (e.g. a person’s name), amended or an alternative provided. Explanatory notes are included as *blue text* and may be deleted after adapting the examples.  Practices may require multiple copies of ‘Competencies for Entitlement as a Duty Holder’ (Appendix 2 of EP1) and ‘Training Records for IR(ME)R Duty Holders’ (Appendix 1 of EP9) to use to record details of individual duty holders. Separate files of these templates are available, for convenience. |

Additional Sources of Information

The Ionising Radiation (Medical Exposure) Regulations 2017 ([www.legislation.gov.uk/uksi/2017/1322/contents/made](http://www.legislation.gov.uk/uksi/2017/1322/contents/made))

[Guidance to the Ionising Radiation (Medical Exposure) Regulations 2017](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/720282/guidance-to-the-ionising-radiation-medical-exposure-regulations-2017.pdf), Department of Health and Social Care (2018) ([www.gov.uk/government/publications/ionising-radiation-medical-exposure-regulations-2017-guidance](http://www.gov.uk/government/publications/ionising-radiation-medical-exposure-regulations-2017-guidance))

Guidance Notes for Dental Practitioners on the Safe Use of X-Ray Equipment. National Radiological Protection Board (2001) ([www.gov.uk/government/publications/dental-practitioners-safe-use-of-x-ray-equipment](http://www.gov.uk/government/publications/dental-practitioners-safe-use-of-x-ray-equipment))  
*updating by Public Health England in progress, expected 2020*

Medical and Dental Guidance Notes, Institute of Physics and Engineering in Medicine (2002) ([www.ipem.ac.uk/ScientificJournalsPublications/MedicalandDentalGuidanceNotes.aspx](http://www.ipem.ac.uk/ScientificJournalsPublications/MedicalandDentalGuidanceNotes.aspx))   
*updating by IPEM in progress, expected 2020)*

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| ***name of dental practice* Employer’s Procedures**  Written Procedures for Dental Exposures | |
| **Author** | *Named person* |
| **Version no.** | *x* |
| **Changes to previous version** | *e.g. Update of EP3* |
| **Authorised by** | *Signature of Employer* |
| **Date of issue** | *01/01/2020* |
| **Reviewer** | *Named person* |
| **Next review date** | *01/01/2021* |

Employer’s Procedures

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| EP 1 | **Entitlement of Duty Holders** | *Name of Dental Practice* |

## Objectives

* To outline the method for entitling individuals as duty holders under IR(ME)R
* To ensure that each duty holder has appropriate registration, qualifications, experience and training (as appropriate) for their entitlement
* To clarify who holds the training records for each duty holder

## Responsibilities

The Employer is responsible for ensuring that structures are in place for entitlement of IR(ME)R duty holders, and for maintaining records of agreed qualifications, experience and training required for individuals to perform the roles of duty holders for all types of dental exposures (EP1 Appendix 1).

*(Named person or Employer)* (the Entitler) entitles persons to act as IR(ME)R duty holders on behalf of the Employer.

The Entitler decides whether the evidence presented is sufficient for each individual to be entitled in the role of Practitioner, Operator, and/or Referrer for dental exposures. They will maintain an up-to-date record of qualifications, training, and tasks for each entitled Practitioner and Operator.

*(Named person, Employer or Job Title)* agrees the range of tasks for staff under their management, which is appropriate and supported by verifiable training and experience, and this defines the duty holder’s scope of practice. *For dental practices with multiple sites, it may be appropriate for the Lead Person at each site to assess their staff’s competence and then provide this information to the Employer or named person for entitlement.*

Each duty holder is responsible for maintaining their own personal training record containing their evidence of training and continuing professional development.

Practitioners and Operators must comply with the Employer’s Procedures.

## The Process of Entitlement

Entitlement is demonstrated by the Entitler signing an individual’s competence document (EP1 Appendix 2). Duty holders themselves must also agree and sign this document. If this is the same person, it is only signed once as the Entitler. The agreed competence for each individual creates their own scope of entitlement which they must adhere to.

The competence document will evolve and be updated as an individual’s scope of entitlement changes, without the need to be resigned by the Entitler.

Competence is assessed for each practitioner and operator by an appropriately trained person. A competence assessor may assess their own competence.

The Medical Physics Expert (MPE) is entitled on appointment. They should only be appointed if they are adequately trained and competent for this specific role and are listed on the RPA 2000 register ([www.rpa2000.org.uk/mpe-recognition-scheme/](http://www.rpa2000.org.uk/mpe-recognition-scheme/)).

Medical Physicists/Technologists may also be entitled as Operators for the purposes of radiation safety surveys or equipment testing and their training records must be provided to the employer on request.

## EP1 Appendix 1 Qualifications, experience and training required for each duty holder role

\* Dental hygienists and dental therapists may carry out Referrer, Practitioner and Operator duties if the duties are within their scope of practice, training and experience. If appropriate training for any duty was not included in their degree or diploma training, additional post-qualification skill development is required (e.g. for the justification, authorisation and clinical evaluation of radiographs). A dentist may be required to report on the entire radiograph for aspects that would not be within the scope of practice of a dental hygienist or therapist.

\*\* A Certificate in Dental Radiography is required if a dental nurse takes radiographs without supervision.

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| **Registrant Group** | **IR(ME)R Duty Holder** | **Qualifications/Training/Experience required** |
| Dentist | Referrer | Registration with GDC and undergraduate dental degree with additional training if requesting CBCT |
| Practitioner | Registration with GDC and undergraduate dental degree |
| Operator | Undergraduate dental degree and local equipment training |
| Dental Hygienist or Dental Therapist | Referrer | Registration with GDC and undergraduate degree in oral health science or diploma in dental therapy or dental hygiene, with additional skills development\* |
| Practitioner | Registration with GDC and undergraduate degree in oral health science or diploma in dental therapy or dental hygiene, with additional skills development\* |
| Operator | Undergraduate degree in oral health science or diploma in dental therapy or dental hygiene, with additional skills development\* and local equipment training |
| Dental Nurse | Operator | Diploma or Certificate in Dental Nursing, Certificate in Dental Radiography\*\* and local equipment training |
| Medical Physics Expert | Operator | Science degree or equivalent  Experience in the application of physics, within dental use of ionising radiation  Recognised by an assessing body, such as RPA 2000, deemed suitable to assess competence by the Department of Health and Social Care (www.rpa2000.org.uk/mpe-recognition-scheme/)  Clear appointment to this role |
| Medical Physicist/Technologists | Operator | *Appropriate qualification* |

## EP1 Appendix 2 Example Competencies for Entitlement as a Duty Holder under IR(ME)R at *name of dental practice*

|  |  |
| --- | --- |
| Name of Duty Holder | Job Title |
| Qualification(s) and date obtained |  |
|  |  |
| Registration Number | Date last checked |

|  |  |
| --- | --- |
| Referrer tasks at *name of dental practice* | **Assigned as competent**  Date & signature/initials of duty holder and assessor |
| Refer for all dental exposures (excluding CBCT) |  |
| Refer for intra-oral exposures |  |
| Refer for Pan/Lat Ceph exposures |  |
| Refer for Cone Beam CT dental exposures |  |

|  |  |
| --- | --- |
| Practitioner tasks at *name of dental practice* | **Assigned as competent**  Date & signature/initials of duty holder and assessor |
| Competent to justify requests for all dental exposures |  |
| Competent to justify requests for intra-oral exposures |  |
| Competent to justify requests for Pan/Lat Ceph exposures |  |
| Competent to justify requests for Cone Beam CT dental exposures |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operator tasks at *name of dental practice* | | **In training** | **Assigned as competent** | |
| Date & signature/initials of duty holder and assessor | Date & signature/initials of duty holder and assessor | |
| Competent to carry out patient identification | |  |  | |
| Competent to authorise all dental exposures for which guidelines have been provided by a practitioner | |  |  | |
| Competent to undertake all dental exposures | |  |  | |
| Competent to undertake intra-oral exposures | |  |  | |
| Competent to undertake Pan/Lat Ceph exposures | |  |  | |
| Competent to undertake Cone Beam CT exposures | |  |  | |
| Competent to process digital images | |  |  | |
| Competent to process dental films | |  |  | |
| Competent to change chemicals in a dental processor | |  |  | |
| Competent to clinically evaluate all dental exposures undertaken at practice | |  |  | |
| Competent to clinically evaluate all dental exposures undertaken outwith the practice | |  |  | |
| Competent to clinically evaluate Cone Beam CT dental exposures | |  |  | |
| Competent to carry out quality assurance on equipment | |  |  | |
|  | | |  |
| Entitled by | | | Date |
| Name of Entitler | | |  |
| Signature of Duty Holder (DH) | | | Date |
| IR(ME)R Procedures read by DH | | | Date |

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| EP 2 | **Referrals for Dental Exposures** | *Name of Dental Practice* |

## Objectives

* To outline how a referral may be made for a dental radiograph
* To ensure that the Referrer provides sufficient information for the patient and the Referrer to be identified and sufficient clinical information for the exposure to be justified and authorised by a Practitioner or authorised by an Operator.

## Responsibilities

The Employer is responsible for establishing recommendations concerning referral criteria for dental exposures and ensuring that these are available to the referrer. These should include an indication of the typical effective dose to the patient for each type of radiographic examination.

When appropriate, the Referrer will supply the Practitioner with sufficient medical data (such as previous diagnostic information or medical records) relevant to the dental exposure to enable the Practitioner to decide on whether there is sufficient net benefit for the exposure to be justified.

## The Process of Referral

A clinical assessment of the patient’s dental anatomy should be performed prior to requesting any radiographs.

**3.1 When the Referrer is also the Practitioner and Operator**

Where the Referrer also acts as the Practitioner and Operator for a dental exposure, they must ensure that the request for the radiograph is documented within the patient’s *dental record/notes page*. Within this record the clinical indications for the radiograph should be clear, fit with the referral criteria and the Referrer must be identifiable.

**3.2 Referring to a different Operator**

If a different entitled Operator is to carry out the dental exposure, then a *request card/referral form/letter/note within the patient’s dental record* must be completed legibly by the Referrer and be available before the exposure can be carried out. Each dental request must be justified and authorised prior to an exposure (see EP3).

The essential information required on each *request card/referral form/letter* is listed below.

* Patient’s full name, date of birth and address
* Dental exposure requested
* Sufficient clinical information relevant to the dental exposure requested, such as previous diagnostic information or dental records
* Signature of Referrer
* Name of Referrer (Printed)
* Date of referral
* Patient contact telephone number (if relevant and available)

**3.3 Incomplete Referrals**

Any referral to another Practitioner or Operator found to be incomplete will be returned to the Referrer and the exposure will not be undertaken until all essential information has been entered.

## Referral Criteria

The referral criteria used at this practice are *the Faculty of General Dental Practitioners ‘Selection Criteria for Dental Radiography’/British Orthodontic Society’s ‘Guidelines for the use of Radiographs in Clinical Orthodontics’/local referral criteria* and copies of this document are made available to the Referrers *in each room/on the intranet/by personal copy*.

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| EP 3 | **Justification and Authorisation** | *Name of Dental Practice* |

## Objectives

* To ensure that every dental exposure is justified and authorised

## Responsibilities

It is the responsibility of an entitled Practitioner to justify each individual dental exposure, taking the following into account:

* the specific objectives of the exposure and the characteristics of the individual involved
* the total potential diagnostic benefits, including the direct health benefits to the individual and the benefits to society, of the exposure
* the individual detriment that the exposure may cause
* the efficacy, benefits and risk of available alternative techniques having the same objective but involving no or less exposure to ionising radiation

Operators cannot undertake justification (unless they are also an entitled Practitioner). In the absence of an entitled Practitioner, authorisation may only be undertaken by an appropriately entitled Operator, in accordance with written guidelines provided by a Practitioner. The responsibility for justification remains with the Practitioner who has provided the written guidelines, but the Operator is responsible for the proper interpretation of these guidelines within the scope of their practice.

If the Practitioner/Operator is aware, at the time of authorisation, that a recorded clinical evaluation will not result from the exposure, then the exposure must not be authorised and cannot take place.

## The Process for Justification and Authorisation

**3.1 When the Referrer is also the Practitioner and Operator**

When the dental professional is acting as entitled Referrer, IR(ME)R Practitioner and Operator, the Referrer’s *signature/ electronic personal code* in the clinical notes next to the request for a radiograph will demonstrate authorisation of the exposure.

**3.2 When the Referrer is also the Practitioner but not an Operator**

If the Referrer is also acting as the IR(ME)R Practitioner, then the *request card/referral form/letter/electronic record* provided to the Operator must also be authorised to demonstrate that justification for the exposure has been carried out.

Authorisation for the exposure is taken to be the *signature, initials or electronic personal code* in the patient’s dental notes against the referral for the radiograph.

**3.3 When the Referrer is not the Practitioner**

If the Referrer is entitled as a Referrer but not a Practitioner, then the request for a dental radiograph must be either:

1. Justified and authorised by an entitled Practitioner.   
   The Practitioner must initial or sign the referral *(state where on the referral or electronic record)* to demonstrate authorisation if they are satisfied that the exposure is justified or;
2. Authorised by an entitled Operator using guidelines.   
   Entitled Operators may undertake authorisation using specific guidelines. Entitled Operators must check the clinical details against the appropriate guideline and, if the details match a criterion, the Operator initials or signs the referral *(state where on the referral or electronic record)* to designate that the dental exposure has been authorised.

Referrals which do not fall within the guidelines issued by the Practitioner cannot be authorised by an Operator and must be referred to a Practitioner for justification.

## Considerations for Justification

When justifying an exposure in the case of asymptomatic individuals, the Practitioner will give particular regard to any guidelines issued by appropriate medical/dental scientific societies, relevant bodies or the Secretary of State.

When justifying an exposure to a carer or comforter (also see EP16), the Practitioner will give particular regard to the net benefit, taking into account the likely health benefits to the patient, the possible benefits to the carer or comforter (which may be psychological rather than physical) and the detriment the exposure might cause to the carer or comforter. Individual justification of exposures to carers and comforters will be carried out in addition to the justification required for the patient.

*If any of these exposures is not carried out at the dental practice they may be deleted.*

## Special Circumstances Regarding Authorisation

Authorisation should be carried out in advance of any dental exposure.

However, it has been recognised that in some specific exceptional circumstances, it may not be feasible for a dentist to carry out authorisation in advance of an exposure. This may occur during treatments where it is not in the best interests of the patient for the dentist to leave them to document the authorisation in the patient’s dental record e.g. an unplanned radiograph due to a complication mid-procedure.

Should this situation arise then the dentist justifying the exposure should be present in the room whilst the radiograph is carried out and authorisation of the exposure must occur as soon as possible within the same episode of care.

This deviation from normal procedure should be documented within the patient’s dental record by the dentist.

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| EP 4 | **Patient Identification** | *Name of Dental Practice* |

## Objectives

* To ensure that each authorised dental exposure is delivered by the entitled Operator to the intended patient

## Responsibilities

The Operator who undertakes the exposure is responsible for ensuring that the correct patient receives the correct exposure.

## The Process for Patient Identification

**3.1 When the Operator undertaking the exposure is not the Referrer**

When a patient is called from a waiting area or room by an entitled Operator who was not the Referrer, the following identification process must be carried out.

Where possible, the Operator should ask the patient to give the 3 identifiers. The procedure must be positive and active (rather than yes/no questions) i.e.

“What is your name?”

“What is your address?”

“What is your date of birth?”

If the patient is deaf these questions can be asked using written cards.

On completion of this, the Operator must verify that this patient identification procedure has taken place by entering their *name/ signature/initials* on the *referral form (state where on the referral)* *or by another method e.g. electronic* to enable them to be identified.

If the patient through illness, physical or mental disability, or language barrier is not able to confirm their identity:

* always treat them with dignity and respect
* a carer or relative may be asked to identify the patient if they are escorted
* examine any personal photographic identification they may have, such as a passport or photocard driving licence
* for patients with language difficulties, the Operator may identify the patient through an interpreter if one is available
* when possible, the Referrer may be asked to confirm the identity of the patient

When the patient is unable to identify themselves, the method used to confirm patient identity should be recorded *in the patient’s dental record/on the referral*. The Operator must verify the patient identification procedure as above adding which method of identification was used.

If there is any doubt about the patient's identification, the Operator must not carry out the radiation exposure.

**3.2 When the patient is already in the dental chair**

When a patient is first called into the dental examination room their identity should be confirmed prior to the dental examination starting, using the method outlined in 3.1. If an Operator, other than the dentist, e.g. dental nurse, carries out this identification there should be a verbal handover confirming ID to the dentist prior to the clinical examination starting.

For follow up patients, a dental chart would also be held which may act as an additional check to ensure that the person being examined is the correct patient.

In this situation if the Referrer, Practitioner and Operator are the same person, then the Operator may be confident that they have the correct patient for the correct x-ray.

If another Operator already in the room, such as a dental nurse, is to undertake the exposure on behalf of the Referrer, then they must also be positive that they have the correct patient and correct examination.

The *signature/initials* of the Operator undertaking the exposure must be recorded *on the referral (state where on the referral) or by another method e.g. electronic*.

## Discrepancies between Patient Identifiers

If one aspect of the patient identifiers does not correspond between the referral and the information obtained but the Operator is sure it is the correct patient, e.g. one digit different in date of birth or different address (old address), then the Operator may use their professional judgement and the details may be changed. Administrative staff should be informed of the change to allow this to be amended on the patient’s dental record.

If there is any doubt about the patient's identification, the Operator must not carry out the radiation exposure.

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| EP 5 | **Pregnancy Enquiries** | *Name of Dental Practice* |

## Objectives

* To outline the requirements for pregnancy enquiries prior to a dental exposure

## Process

Within this dental practice, we currently do not undertake any radiographic examinations where the foetus will be exposed to the primary beam of radiation.

Dental radiographic imaging is by general professional consensus not damaging to a developing foetus.

A general poster advising pregnant patients to inform the dentist before any type of dental treatment or procedure is clearly displayed in the practice waiting room or treatment area. The poster should be brought to the attention of the patient.

Information relating to the benefits and risks of an exposure will be provided to all patients (see EP17).

If a pregnant patient is particularly concerned about the potential for the radiograph to damage their unborn child, and is not reassured by the dentist, counsellor or Radiation Protection Adviser/Medical Physics Expert, then the dentist may delay the radiograph if it is in the best interests for the patient’s health and wellbeing.

This decision will be documented in the patient’s dental record.

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| EP 6 | **Assessment of Patient Dose** | *Name of Dental Practice* |

## Objectives

* To enable assessment of patient dose for any dental exposure to be undertaken by accurately recording such exposures to ionising radiation

## Responsibilities

The Operator undertaking the exposure must ensure that the data required to assess patient dose is recorded, as outlined below.

The Employer is responsible for implementing a programme for carrying out patient dose surveys and consulting with the Medical Physics Expert (MPE).

The Employer will provide the dose estimates to the Secretary of State if requested.

## The Process for Recording Factors Relevant to Dose

All Operators initiating a dental exposure should adhere to the standard settings as laid out in the dental practice’s exposure charts, unless further optimisation is possible or necessary. Only if these standard settings are deviated from is it necessary that the actual settings used be individually recorded e.g. kV, mA and time(s).

These, along with the total number of exposures must be recorded *in the patient’s notes/within the radiographic image quality log/electronic record.* This will include the reason for carrying our any repeat exposures. In addition, the reasons for significantly exceeding any Diagnostic Reference Levels (DRLs) should be recorded (see EP7).

When available, the Operator must also record within the patient’s dental record/radiographic log/electronic record the following details:

* Dose Area Product (DAP) value
* Dose Width Product (DWP) value
* Other dose indicator e.g. exposure or sensitivity index for digital images

Equipment installed on or after 6 Feb 2018 will have a device or other feature that provides information on the relevant parameters to allow assessment of the patient dose. Where appropriate, the equipment will also have the capacity to transfer this information to the record of the exposure.

The Operator undertaking the exposure will be aware of the range of doses or DRLs that result from the exposure factors set within the protocols.

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| EP 7 | **Diagnostic Reference Levels** | *Name of Dental Practice* |

## Objectives

* To ensure that diagnostic reference levels (DRLs) for the common dental exposures performed are in place
* To ensure that there is an assessment of compliance with these DRLs
* To ensure that where it is known that DRLs are consistently exceeded, a review and corrective action will be taken

## Responsibilities

The Employer is responsible for regularly reviewing and making available to the Operator, DRLs for exposures, taking into account national and European DRLs where available.

The Employer is responsible for ensuring appropriate reviews are undertaken whenever DRLs are consistently exceeded and that corrective action is taken where appropriate.

The Operator undertaking the exposure must ensure that data to assess patient dose is recorded, in line with EP6.

The Medical Physics Expert (MPE), as laid out within their contract, may use dose survey results to create and review local DRLs having regard for any available national or European DRLs *every 3 years*.

When a DRL is consistently exceeded, the MPE must be involved in the review.

## Establishing DRLs

DRLs provide standard values of dose that are derived from a dose audit. They are set in terms of measurable dose-related quantities such as patient entrance dose (PED) or dose area product (DAP) values for typical examinations of average size patients.

* The DRLs are prepared by the MPE, as laid out within their contract/based on recent national dose surveys and will be subject to review every *3 years.*
* Current DRLs are made readily available *near the relevant x-ray machine/in the Radiation Protection File/other location*.
* Once set, these DRLs are not expected to be exceeded when good and normal practice regarding diagnostic and technical performance is applied.

## Using DRLs

If the dental x-ray machine provides a DAP value or some other dose indicator this should be reviewed by the Operator with regard to the appropriate DRL. This dose value will be recorded in the patient’s *dental record/electronic record* in line with EP6.

If the dental x-ray machine does not provide a DAP value or other dose indicator, it is not possible to directly consider the dose with regard to the DRL. In this case, the representative dose for the given settings, as reported in the routine x-ray machine performance tests, can be compared against the DRL.

## Reviewing DRLs that are Consistently Exceeded

The MPE, RPS or Operator must inform the Employer as soon as they are aware that the DRL is being consistently exceeded.

If the DRL is believed to be consistently exceeded (as identified by the MPE, Operator or RPS), the reasons must be investigated immediately by the *Employer/named person/MPE* so that corrective action may be taken.

Any corrective action should be documented and communicated to relevant staff.

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| EP 8 | **Clinical Evaluation** | *Name of Dental Practice* |

## Objectives

* To ensure every dental exposure undertaken within *name of dental practice* has a recorded clinical evaluation

## Responsibilities

An entitled Operator is responsible for ensuring that a clinical evaluation is recorded in the patient’s *dental record/electronic record.*

## The Process of Recording a Clinical Evaluation

Following a dental exposure each image must be clinically evaluated by an Operator and the findings documented in the patient’s *dental record/electronic record*.

This evaluation of the whole image will include:

* The identity *(signature/initials)* of the Operator undertaking the evaluation
* The details of all findings including:
* charting of caries
* findings relevant to the patient’s management or prognosis
* in the case of a pre-extraction radiograph, it may be sufficient to record either ‘root form simple’ or ‘nothing abnormal diagnosed’

If the Operator is a dental hygienist or dental therapist, a dentist may be required to report on the entire radiograph for aspects that would not be within the scope of practice of the dental hygienist or therapist.

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| EP 9 | **Training and Education** | *Name of Dental Practice* |

## Objectives

* To ensure all entitled Practitioners and Operators have undertaken adequate training for the duties they are entitled for, and that records of such training are maintained and reviewed
* To ensure that entitled Practitioners and Operators undertake continuing professional education and training after qualification including, in the case of clinical use of new techniques, training related to these techniques and the relevant radiation protection requirements

## Responsibilities

The Employer is responsible for ensuring that arrangements are in place to maintain an up-to-date list of duties and qualifications for each duty holder (see EP1 Appendices 1&2).

The Employer is responsible for ensuring that Practitioners and Operators are adequately trained and undertake relevant continuing professional training.

The Employer will maintain an up-to-date training record for each Practitioner and Operator (see EP9 Appendix 1) and have this available for inspection by the relevant authority.

The Employer is responsible for ensuring that the training records are reviewed on an *annual* basis and that this review is used to inform a duty holder’s scope of entitlement.

In addition to the Employer’s responsibilities regarding training (as above), Practitioners and Operators should satisfy themselves that they have appropriate training and experience to undertake duties that they are entitled to perform, and maintain a personal portfolio of their education, training, experience and competence. They must not carry out any duty for which they have not been trained and entitled.

Where the Employer is also the Practitioner and/or Operator, they must ensure that they undertake, and keep a record of, appropriate continuing education and training.

## Process

The basic requirements for entitlement as a duty holder are listed in EP1 Appendix 1.

Each duty holder’s training records (see EP9 Appendix 1 for examples) should demonstrate the nature of any training and the date on which training was completed. For GDC registrants, verifiable continuing professional development training in radiation protection is highly recommended; currently 5 hours in every 5 year cycle.

*Annual appraisals* including checks of ongoing relevant professional education are undertaken for each duty holder by the *duty holder’s line manager*. Each duty holder should provide their own personal training records for this appraisal to ensure that a maintained competence for each duty holder role can be demonstrated.

*Named person/Employer/Job role* must check the registration for all Referrers and Practitioners on an annual basis. A record of such registration and the date checked is held within the individual’s competence document (see EP1 Appendix 2 for examples).

On induction and with the implementation of any new radiation equipment or equipment software, there must be associated training which must be documented within the duty holder’s training record. Their scope of practice should be reassessed by a competence assessor.

## Third Party Training Records

Where the Employer enters into a contract with a third party (e.g. an agency or medical physics service) to engage a Practitioner or Operator (e.g. agency staff or MPE), the third party will be responsible for keeping the Practitioner or Operator’s training records and supplying them to the Employer on request.

## Students/Trainees

An Operator or Practitioner who is assigned as ‘In Training’ for any particular competence may undertake any aspect of that function, as part of practical training, provided if this is done under the supervision of a person who is themselves adequately trained and entitled for that duty.

This is expected to be ‘direct’ supervision and the supervisor will take responsibility for the activity as if they had carried it out themselves.

**EP9 Appendix 1 Example Training Records**

|  |  |
| --- | --- |
| **Name of duty holder** |  |
| **Job title** | *e.g. dental nurse* |
| **Entitlement** | *e.g. Operator* |

**Training reviewed by: Date:**

**Next training review due:**

**External Training**

|  |  |  |
| --- | --- | --- |
| **Type of training** | **Qualification** | **Date** |
| *e.g. dental nurse training including radiography* | *Certificate in Dental Nursing* |  |
| *e.g. CPD training on radiation protection* |  |  |
|  |  |  |
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**In-house Training** (if applicable)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Site/Room/Equipment | *e.g. Glasgow Dental Practice, Exam room 2, Intra oral machine* | | | |
| Task | | 🗸 | Trainer initials | Date |
| Switch x-ray equipment on and off | |  |  |  |
| Aware of exposure charts and protocols | |  |  |  |
| Can select appropriate exposure factors | |  |  |  |
| Undertake an intra oral dental exposure | |  |  |  |
| Use rectangular collimation | |  |  |  |
| Emergency procedure for equipment failure | |  |  |  |
| Complete room log including exposure factors/dose when appropriate | |  |  |  |
| This person has received training on the above tasks | | | | Date |
| Signature of trainer |  | | |  |
| Name of trainer |  | | | |
| Signature of duty holder |  | | |  |
|  |  |  |  |  |
| Site/Room/Equipment | *e.g. Glasgow Dental Practice, Exam room 2, Desktop processor* | | | |
| Task | | 🗸 | Trainer initials | Date |
| Switch x-ray equipment on and off | |  |  |  |
| Process a film | |  |  |  |
| Clean processor | |  |  |  |
| Change chemicals in processor | |  |  |  |
| Processor QA | |  |  |  |
| This person has received training on the above tasks | | | | Date |
| Signature of trainer |  | | |  |
| Name of trainer |  | | | |
| Signature of duty holder |  | | |  |
|  |  |  |  |  |
| Site/Room/Equipment | *General* | | | |
| Task | | 🗸 | Signature of duty holder | Date |
| Familiar with the responsibilities and processes described in the Employer’s Procedures and Local Rules | |  |  |  |
|  |  |  |  |  |

*Additional or alternative records for training should be included as appropriate for each duty holder. Training should map to the required competencies for each IR(ME)R duty holder (see EP1).*

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| EP 10 | **Incident Reporting** | *Name of Dental Practice* |

## Objectives

* To ensure that incidents and near misses involving patient overexposures are properly investigated and recorded
* To ensure that reportable radiation incidents are reported to the appropriate statutory authority promptly
* To ensure that the dental professionals involved in the care of the patient, and the patient or their representative, are informed of any clinically significant accidental or unintended exposures

## Responsibilities

The individual who identifies an error is responsible for recording all available data concerning the incident or near miss and for informing *the Employer/RPS* within one working day.

The Employer is responsible for undertaking an immediate preliminary investigation of the accidental or unintended exposure, liaising with the Medical Physics Expert (MPE) regarding the patient dose as necessary.

The MPE is responsible for making an assessment of the dose to the patient and for advising the Employer on whether an incident needs to be reported to the relevant enforcing authority or if any other steps need to be taken.

If the exposure has involved significantly greater levels of ionising radiation than considered proportionate in the circumstances, the Employer will notify the relevant enforcing authority immediately and arrange for a detailed investigation of the exposure to be carried out.

The Employer is responsible for informing the relevant enforcing authority of the outcome of the detailed investigation and any corrective action taken*.*

Notifications should be submitted to Healthcare Improvement Scotland (HIS; see section 3 for details).

## Investigation and Reporting

If it is suspected that an unintended patient exposure, overexposure or near miss has occurred, the duty holder will record *on an incident form/other method of recording* and provide it to the *Employer/RPS:*

* The age and demographic details of the patient
* The x-ray machine settings, the kV and mAs and dose area product (DAP) (if known)
* Any other relevant information e.g. error codes, time for which the exposure appeared to continue, or unusual signals
* What happened and why
* Any other relevant information

If it is suspected that the incident is due to an equipment malfunction, the equipment must be withdrawn from use and other staff notified. Warning signs should be placed on the faulty equipment. The equipment must not be reused until the reason for the incident has been clarified and any faults rectified. The equipment service engineer or RPA should be called for assistance if required.

*Named person/Employer* will assemble evidence to determine what events led to thenear miss or incident and to allow the dose to be calculated in consultation with the MPE or RPA. Unless the preliminary investigation shows beyond doubt that a significant accidental or unintended exposure has not occurred, the relevant enforcing authority will be notified immediately, and a detailed investigation carried out.

The report from this investigation will include details of what happened and why it is an accidental or unintended exposure, the dose assessment, the age and sex of the patient, what actions have been taken to minimise the risk of a similar incident occurring in the future and any other recommendations. The *Named person/Employer/MPE/RPA* will inform Healthcare Improvement Scotland (HIS) of the outcome and any corrective action taken.

Further information on the criteria for significant accidental and unintended exposures and the notification process can be found on the HIS website (<http://www.healthcareimprovementscotland.org/our_work/inspecting_and_regulating_care/ionising_radiation_regulation.aspx>).

The Referrer and Practitioner involved in the care of the patient will be informed of any clinically significant unintended or accidental exposure and the outcome of the analysis.

The patient will be informed of the exposure unless, in exceptional circumstances, it is deemed not to be in their best interests. In such cases, the patient’s representative should be informed where possible. The decisions and actions around informing the patient should be documented in the patient’s dental records.

Note:

Incidents involving an exposure of a patient to a radiation dose significantly greater than those generally considered to be proportionate in the circumstances, are reportable to HIS whether they are due to an equipment fault or they result from an error or procedural failure.

## Records and Learning

*Named person/Employer* will place copies of the incident report in the Radiation Protection File (RPF) and the patient’s *dental/electronic* records.

Records of analyses of near miss events will also be kept in the RPF.

Any lessons arising or changes to practice following the investigation will be implemented to ensure that the risk is minimised in the future. Relevant staff will be informed of all incidents, any lessons arising from the investigation and any changes to practice by *e-mail/staff meeting/handover book.*

|  |  |  |
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| EP 11 | **Reducing the Probability and Magnitude of Unintentional Exposures** | *Name of Dental Practice* |

## Objectives

* To ensure that the probability and magnitude of accidental or unintended exposures is kept as low as reasonably practicable

## Responsibilities

The Employer is responsible for ensuring that an equipment inventory is kept for all radiation equipment and that the equipment is maintained in accordance with manufacturer’s instructions.

All duty holders must comply with the Employer’s procedures.

Practitioners and Operators are responsible for ensuring that the doses arising from an exposure are kept as low as reasonably practicable consistent with the intended purpose.

## Process

This dental practice has adopted the following to reduce the risk of unintended exposures:

* Employer’s procedures and protocols in place and regularly reviewed to ensure they match local practice
* Regular quality assurance of all equipment to ensure correct functioning
* Additional equipment quality assurance checks carried out if over 10% of images are deemed unacceptable
* Feedback given to dental professionals following any incident
* Training and competence assessments undertaken including when new equipment and procedures are introduced
* Induction programmes for new staff
* Grading and review of quality of dental images
* Radiology audit
* Good practice and technique
* Investigation of near miss incidents
* Peer review of images – assessment of image quality to include positioning, collimation, density, sharpness and exposure

|  |  |  |
| --- | --- | --- |
| EP 12 | **Document Control** | *Name of Dental Practice* |

## Objectives

* To ensure appropriate document control for all IR(ME)R documents
* To ensure that procedure and protocol documents are reviewed regularly and made available to all duty holders

## Responsibilities

The Employer is responsible for ensuring that the Employer’s written procedures and protocols are reviewed regularly. In this dental practice the procedures and protocols are reviewed *every year* or sooner if practice changes or new equipment is installed.

If a procedure or protocol changes it is the responsibility of the Authoriser to inform all relevant staff.

The Author of a document is responsible for the content whilst the Authoriser is responsible for ensuring the document is in place.

## Document Control

Each document is uniquely identified, for example, Employer’s Procedures EP1, and for written protocols, PRO1 etc.

### Employer’s Procedures

The Employer’s Procedures in this practice include information on author, version and review on the front page of the suite of procedures as shown in the following example:

|  |  |
| --- | --- |
| ***Name of Dental Practice* Employer’s Procedures**  Written Procedures for Dental Exposures | |
| Author |  |
| Version no. |  |
| Changes to previous version |  |
| Authorised by |  |
| Date of issue |  |
| Reviewer |  |
| Next review date |  |

Individual procedures display a header to identify the procedure and dental practice:

|  |  |  |
| --- | --- | --- |
| EP *x* | ***Title of Procedure*** | *Name of Dental Practice* |

Individual procedures also display a footer to identify the version:

Employer’s Procedures Version 1 Page *x* of *x*

### 3.2 Written protocols and other IR(ME)R documents

These display a header and footer:

Header

|  |  |  |
| --- | --- | --- |
| PRO *x* | ***Title of Protocol*** | *Name of Dental Practice* |

Footer

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Issue date: | Version no.: | Authorised by: | Author: | Review date: | Page *x* of *x* |

### 3.3 Document holding and control

All Employer’s Procedures and written protocols are held *on the practice intranet/other digital location* and are available to all practice staff. These electronic documents are watermarked ’Uncontrolled when printed’ to indicate that these are the only controlled versions of these documents.

All duty holders must comply fully with Employer’s Procedures**,** and appropriately withwritten protocols (allowing appropriate latitude for professional judgement), so each employee is responsible for ensuring that they are working to the current version of these procedures and protocols (which may be printed for convenience).

|  |  |  |
| --- | --- | --- |
| EP 13 | **Radiology Audit** | *Name of Dental Practice* |

## Objectives

* To ensure that regular clinical audit of radiology is undertaken
* To ensure that the processes included in the Employer’s Procedures and protocols are audited for compliance by the duty holders

## Responsibilities

The Employer is responsible for ensuring that regular audits are undertaken with a consistent approach and that the outcomes of all audits are fed back to relevant staff.

## Process

The Employer will ensure that an audit program is in place, to ensure that all quality assurance processes, records, logs, procedures and protocols are implemented and to identify any areas for improvement.

The audit program describes the person responsible for carrying out each of the audits, the standards, criteria, timescales and details of the audit process.

The audit program can be found in the *audit file/electronic folder.*

The following will be undertaken at this dental practice *[amend listed examples as appropriate]*:

* *Assurance that all procedures and protocols are within date and will be reviewed by the review date.*
* *An audit of duty holders’ entitlement along with their supporting qualifications and training. This will ensure that their scope of entitlement matches the duties performed and is supported with evidence of training and continuing professional development.*
* *An audit of referrals and their reports to ensure that each referral has been documented in line with EP2 and that a clinical evaluation has been carried out in line with EP8. This will also ensure that the Referrer, Practitioner and Operator for each exposure can be identified.*
* *An audit of patient dose to be undertaken every 3 years by the MPE.*
* *An overview of all incidents reported in the last 12 months, including outcomes.*
* *A review of image quality and any repeat exposures.*
* *An audit of routine and safety testing of x-ray equipment.*
* *An audit to ensure that research exposures have been taken in line with EP14*
* *An audit to ensure that non-medical exposures have been taken in line with EP15*

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| --- | --- | --- |
| EP 14 | **Research Exposures** | *Name of Dental Practice* |

No research exposures are currently undertaken at this dental practice

*If this is the case, the rest of EP14 may be deleted.*

## Objectives

* To ensure that all research undertaken restricts any dose of ionising radiation to the minimum required to achieve the intended clinical result and that each study complies with regulatory requirements

## Responsibilities

The Employer must ensure that all research has received approval from an ethics committee. The Employer must also determine that there is sufficient net benefit to allow research exposures to go ahead and ensure that every request is authorised and a clinical evaluation performed.

The Referrer must indicate in the patient’s dental record that the request is for a research exposure.

The Medical Physics Expert (MPE) will be involved with the dose and risk assessment, as agreed within their contract, and will identify

* a dose constraint, when no direct medical benefit is expected to the individual from the exposure
* an individual target level of dose for patients who are expected to receive a diagnostic benefit from the exposure

## Process

The Employer will ensure that systems are in place to inform any Practitioner and Operator, who might be involved in an exposure, that patients may be part of a research study when they are referred for imaging. This will be communicated by *e-mail/staff meeting/handover book.*

It is the responsibility of the individual Practitioner for a research study to ensure that every request is justified. Special attention is required for the justification of exposures that have no direct benefit for the individuals undergoing the exposure.

A protocol for each research project will be written by the research practitioner and be made available to all Operators *in the research folder/electronically*.

The Practitioner will ensure that Operators are aware that a request is part of a research study.

* Operators must follow the research protocol specifically developed for the research study
* Operators must ensure that the dose constraint set by the MPE is adhered to
* Operators must report to *named person/their line manager* any instances where exposures are being made for research purposes where this has not been clearly indicated on the request or if they suspect that the study has not been approved
* The clinical evaluation must be performed by an appropriately entitled operator, and reported through appropriate communication arrangements

## Patient Consent

All potential participants must receive a written explanation of the research programme and its risks and have the opportunity to discuss these with a responsible person before agreeing to take part. The explanation must make clear that treatment will not be prejudiced by failure to take part.

All individuals taking part in a research programme do so voluntarily. Each participant will sign a statement indicating that the whole procedure has been properly explained, that they voluntarily undertake the procedure and are aware of the risks including those from the radiation exposure.

|  |  |  |
| --- | --- | --- |
| EP 15 | **Non-Medical Imaging** | *Name of Dental Practice* |

No non-medical imaging is undertaken at this dental practice

*If this is the case, the rest of EP15 may be deleted.*

## Objectives

* To ensure that all non-medical imaging exposures undertaken restrict any dose of ionising radiation to the minimum required to achieve the intended result and that special attention is given to the justification and optimisation of these exposures

## Responsibilities

The Referrer must indicate within the dental records that the request is for a non-medical imaging exposure.

The Practitioner will pay special attention to the justification of non-medical exposures.

The Practitioner and Operator must ensure that these exposures are fully optimised.

## Process

Non-medical imaging refers to exposures undertaken deliberately for purposes other than to bring a health benefit. Examples include:

* dental radiographs for employment purposes, such as for military personnel/flight crew or deep-sea divers
* radiological imaging for insurance or legal purposes
* radiological age assessment
* identification of drugs or other evidence that may be concealed within a dental cavity

*Delete or add any other types of non-medical imaging exposure*

Referrals for non-medical imaging exposures must be clearly identified and must be justified by a dentist.

No person will carry out a non-medical imaging exposure unless it complies with the Employer’s Procedure for such exposures.

The dental radiographic history of each patient attending for non-medical imaging exposures should be checked by the Operator and recent similar examinations should be taken into account. For instance, it may not be necessary to complete a whole series of radiographs if some have been taken recently.

|  |  |  |
| --- | --- | --- |
| EP 16 | **Exposure of Carers and Comforters** | *Name of Dental Practice* |

## Objectives

* To identify when carers or comforters should be used to support patients during radiography and how doses to the carers and comforters can be minimised
* To establish appropriate dose constraints and guidance for the exposure of carers and comforters

## Responsibilities

The Employer is responsible for establishing dose constraints and guidance for the protection of carers and comforters.

The Practitioner will pay special attention to the justification of exposures to carers and comforters.

The exposure of a carer or comforter must be authorised.

The Practitioner and Operator must ensure that these exposures are minimised.

The Medical Physics Expert (MPE) will advise on dose constraints and dose assessment.

## Dose Constraints

Where a carer or comforter remains in the room with the patient during intra-oral radiography a dose constraint of *0.1 mSv* to the carer/comforter per radiography session will be used. A session is defined as one visit to the practice and may involve up to 2 radiographs.

The Employer must undertake a risk assessment to estimate the potential dose to the carer or comforter and it must be ensured that the dose is less than the dose constraint.

## Process

Carers and comforters should only provide support where the patient is unable to keep the image receptor still, or where the patient requires reassurance during a radiograph. Examples include a parent or carer supporting a young child or a patient with additional needs and staying in the controlled area while the patient is undergoing a dental exposure.

Carers and comforters will only be involved in intra-oral radiography. They will not provide comfort/support for panoramic, cephalometric and CBCT radiography.

Particular consideration should be given to justification for an exposure to a carer or comforter, taking into account the net benefit, by considering the likely health benefits to the patient, the possible benefits to the carer or comforter (which may be psychological rather than physical) and the detriment the exposure might cause.

Carers and comforters must have the risks and benefits of being present during the exposure to radiation fully explained to them before the exposure is taken (e.g. see EP17).

The Practitioner must authorise the exposure and document in the patient record that a carer or comforter has been involved in the exposure.

The Operator should ensure the dose to the carer or comforter is kept as low as reasonably practicable. As such the following restrictions apply:

* If required, the film or digital detector should be held by using a pair of forceps to avoid direct irradiation of the fingers and should not be hand held
* The person providing support should be positioned so that they will not be in the direct beam and should ideally stand as far away from the patient and tube as possible
* Manual support should not be regularly provided by any one person

It is not essential for the person supporting the patient to wear a protective lead apron, provided that the above steps are followed and the number of films taken does not exceed 10.

It is not necessary for the person supporting the patient to be issued with a personal radiation monitor, provided the above steps are followed.

|  |  |  |
| --- | --- | --- |
| EP 17 | **Provision of Information Relating to the Benefits and Risks of an Exposure** | *Name of Dental Practice* |

## Objectives

* To ensure compliance with the requirements of the Regulations for providing prior information on the benefits and risks associated with the radiation dose from a dental exposure

## Responsibilities

The Employer must ensure that wherever practicable, and prior to an exposure taking place, the individual to be exposed or their representative is provided with adequate information relating to the benefits and risks associated with the radiation dose from the exposure.

## Process

Within this dental practice, the responsibilities outlined in Section 2 will be addressed by displaying copies of the poster\* shown in EP17 Appendix 1 in each of the dental surgeries, bringing the poster to the attention of the patient and answering any associated questions.

Or

Within this dental practice, the responsibilities outlined in Section 2 will be addressed by providing the patient with printed information in the form of a *printed version of* *the poster/copy of patient information leaflet* and answering any associated questions.

Or

Within this dental practice, the responsibilities outlined in Section 2 will be addressed by *describe alternative process* and answering any associated questions.

*\*The information must be readable by the patient, therefore if wall-mounted, the poster should be either A3 or A2 size depending on the distance from the patient to the host wall.*

*Posters placed in a clinical area should be laminated to facilitate cleaning of the surface when required.*

**EP17 Appendix 1**



(This poster is available in other languages and these will be displayed in this practice as appropriate)

|  |  |  |
| --- | --- | --- |
| EP 18 | **Equipment Inventory and Quality Assurance** | *Name of Dental Practice* |

## Objectives

* To ensure that an up-to-date inventory of radiography equipment is maintained
* To ensure that appropriate equipment quality assurance is undertaken

## Responsibilities

The Employer is responsible for implementing and maintaining a quality assurance programme to ensure that the equipment is fit for use and maintained effectively to provide optimum imaging.

The Employer is responsible for ensuring that adequate routine and safety testing is carried out.

The Employer is responsible for maintaining an up-to-date inventory of x-ray equipment and providing this to the relevant enforcing authority if requested.

## Process

An inventory of x-ray equipment within the practice will be kept, including the type of machine, manufacturer, model and serial numbers, year of manufacture, year of installation, location and date of acceptance test. The inventory will be updated when new equipment is installed.

An x-ray machine quality assurance testing log (routine testing and maintenance record) will be maintained, that documents the type of test, date, who carried out the testing and when the next test is due.

A log of routine surveillance (visual safety checks) will be maintained.

The equipment inventory and quality assurance logs, along with testing and maintenance reports will be kept in the Radiation Protection File.