IRMER
Ionising Radiation Medical Exposure Regulations

Download for information at www.scottishdental.org

IONISING RADIATION (MEDICAL EXPOSURE) REGULATION 2000 (as Amended)

(IR(ME)R AN EXPLANATION GUIDE TO DENTISTS DEC 2011

• These regulations are concerned with the safety of patients
• They came into force on 13 MAY 2000
• They replace the Ionising Radiation (Protection of Persons Undergoing Medical Examination or Treatment) Regulations 1988 (IRR 88)
  • JUSTIFICATION
  • OPTIMISATION
  • LIMITATION

JUSTIFICATION

NO PRACTICE shall be adopted unless its introduction produces a net benefit

Regulation 6 IRMER REGS

© Barbara H Lamb 2017
• Sufficient net benefit
• Detriments
• Alternatives
• Write it down!!!!!

Regulation 5 (2)

The practitioner shall be responsible for the justification of a medical exposure
• Selection Criteria in Dental Radiology

OPTIMISATION

ALL EXPOSURES shall be kept as low as reasonably practicable
ALARP taking economic and social factors into account

RADIATION RISKS

AGE IN YEARS  MULTIPLICATION FACTOR PER RISK OF CANCER

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Multiplication Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDER 10</td>
<td>x 3</td>
</tr>
<tr>
<td>10-20</td>
<td>x 2</td>
</tr>
<tr>
<td>20-30</td>
<td>x 1.5</td>
</tr>
<tr>
<td>30-50</td>
<td>x 0.5</td>
</tr>
<tr>
<td>50-80</td>
<td>x 0.3</td>
</tr>
<tr>
<td>OVER 80</td>
<td>Negligable</td>
</tr>
</tbody>
</table>

• Lower the age—Higher the risk
• Justification
• Dose limitation:
  - Technique
  - Quality Assurance
  - Selection Criteria

© Barbara H Lamb 2017
- Use of guideline exposure settings

All doses must be kept as low as reasonably practicable ALARP

Apply QA procedures to the optimisation of patient dose

**Regulation 7 (3)**

- the operator shall select equipment and methods to ensure that for each medical exposure the dose of ionising radiation to the individual undergoing the exposure is as low as reasonably practicable.

  - Written protocols in place for type of standard exposure for each x-ray set
  - Adherence to diagnostic reference levels

Practical aspects

- Tube operating parameters
- Rectangular collimation
- Film speed
- X-ray holders

**Regulation 4 (c)**

- Diagnostic reference levels for radiodiagnostic examinations having regard to European DRLs
- A radiation dose for a typical examination for a standard sized patient
- Aid to optimisation
- National or European DRLs
- Should not be exceeded without good reason
- Do we know?
- MPE

**LIMITATION**

- The dose equivalent to individuals shall not exceed the limits recommended by the ICRP

- INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION
DEFINE NEW POSITIONS of RESPONSIBILITY:
IRMER DUTY HOLDERS

• The Employer (Legal Person)
• The Referrer
• The Practitioner
• The Operator

IRMER regulations 2, 4 and 5

ESSENTIAL REQUIREMENTS IRMER 2000

DUTIES OF EMPLOYERS: WRITTEN PROCEDURES

ENTITLEMENT AND IDENTIFICATION

REFERRERS/PRACTITIONERS/OPERATORS

ENTITLEMENT SHOULD BE IN WRITING

• To include scope of entitlement
• Records of training and competency

WRITTEN PROCEDURES TO IDENTIFY PATIENTS

• Difference between referrer and operator?
• ask the patient
• what is your name?
• what is your date of birth?
• what is your address?

IDENTIFICATION OF PREGNANT PATIENTS

• Why?
• When?
• How?
AUTHORISATION AND JUSTIFICATION OF EXPOSURES

• Referral
  - Clinical indications to allow justification

• Justification  - intellectual process

• Authorisation – signature to prove justification

DOCUMENTED BEFORE films are taken

CARRYING OUT AND RECORDING CLINICAL EVALUATION

Evaluation of dental Exposure

• Evaluation to be recorded for every examination
  - Dentists Report
  - Record in the patients notes

• If no evaluation is recorded
  - exposure was not justified
  - exposure was illegal

Regulation 8

• Clinical evaluation of the outcome of each procedure is recorded in accordance with the employer's procedures

USE OF DIAGNOSTIC LEVELS (DRLS)

DIAGNOSTIC REFERENCE LEVELS

• Typical dose for a standard patient
• Set locally
• National recommendations
- Intra-oral film - 2.1 mGy (ESD)
- Panoral film - 65 mGy (DWP)

DOSES GREATER THAN INTENDED

Notification when dose to patient is much greater than intended not due to equipment fault
- report to Care Quality Commission (England)
- Scottish Ministers

Example – wrong patient being x rayed

COMPLIANCE WITH QA PROGRAMMES

• Assessment of patient dose
• Reducing probability and magnitude of accidental and unintended doses to patients

PROVISION FOR CLINICAL AUDIT

• Written Protocols and guideline exposure settings for every type of standard projection for each item of equipment
• Procedures for overexposure (not machine malfunction)

IRMER AND TRAINING

For practitioner and operator

• Proof of training
• Training records kept by the employer

It is recommended that these employers written procedures and the local rules are kept together as the

RADIATION PROTECTION FILE

© Barbara H Lamb 2017
DUTIES OF THE
• REFERRER
• PRACTITIONER
• OPERATOR

THE REFERRER
A registered doctor or dentist or other health professional entitled to refer a patient to a practitioner for a medical exposure. The referrer is responsible for supplying the practitioner with sufficient information to justify an appropriate exposure
• Must have been a history and clinical examination previous to the referral
• Previous radiographs should accompany the patient if relevant
• Diagnostic information entered in writing

THE PRACTITIONER
• A registered doctor or dentist or other health professional entitled to take responsibility for a medical exposure. The practitioner must be adequately trained to take decisions and the responsibility for the justification of every exposure
THE OPERATOR

• The person conducting any practical aspect of a medical exposure
• Practical aspects include:
  • patient identification
  • positioning film, patient or x-ray tubehead
  • Setting of exposure options
  • Pressing the exposure switch to initiate the exposure
  • Processing films
  • Clinical evaluation of exposures
  • Exposing test objects as part of QA programme
• The operator must be adequately trained for their role in the exposure

JUSTIFICATION OF INDIVIDUAL MEDICAL EXPOSURE

• Before and exposure can take place it must be justified (ie assessed to ensure that it will lead to a change in the patient’s management and prognosis) by an IRMER practitioner and authorised as the means of demonstrating that it has been justified
• Every exposure should be justified on the grounds of------
• The radiation risk associated with radiographic examination
• The efficacy, benefits and risks of alternative techniques having the same objectives involving no or less exposure to ionising radiation

HISTORY AND CLINICAL EXAMINATION ARE THE ONLY ACCEPTABLE MEANS OF DETERMINING THAT THE MOST

© Barbara H Lamb 2017
APPROPRIATE OR NECESSARY RADIOGRAPHIC VIEWS ARE REQUESTED

CLINICAL AUDIT
Provision must be made for clinical audit

EXPERT ADVICE
Involvement of Medical Physics expert for advice on measurement and optimisation of patient dose...usually the RPA can act as the MPE

EQUIPMENT
Keeping and maintenance of itemised inventory of equipment including:

Name of manufacturer

• Model no
• Serial no
• Year of manufacture
• Year of installation

EQUIPMENT INVENTORY

• Regulation 10 –
  The employer shall draw up, keep up to date and preserve at each radiological installation an inventory of equipment at that installation, and when requested, shall furnish it to the RQIA.

• REGULATION AND QUALITY IMPROVEMENT AUTHORITY
REFERRAL FORM

• Patient details
• View requested
• Clinical reason for request
• Particular areas of interest to be included on the film
• Authorisation to prove Justification
• Relevant medical history
• Signature – can be electronic

SUBJECTIVE QUALITY RATING

1. No less than 70%  Excellent – no errors of exposure, positioning or processing
2. No greater than 20%  Acceptable – some errors of exposure, positioning or processing
3. No greater than 10%  Un acceptable – errors rendering film unacceptable

Documented with steps to rectify

Reported - Recorded – Signed

Exposure assessment:

• Local rules and exposure parameters
• Size of patient

© Barbara H Lamb 2017
• Condition of dentition
• Reason for radiograph    PA Path    Caries    Bone levels

ADEQUATE TRAINING AND CONTINUING EDUCATION

• OPERATORS AND PRACTITIONERS must have received adequate training and must undertake continuing education and training after qualification
• Nature of training is in the GUIDANCE NOTES

OPERATOR ADEQUATE TRAINING

OPERATORS INVOLVED IN RADIOGRAPHING PATIENTS

• Dentists - practitioner training
• Dental nurses - possess Certificate in Dental Radiography from a course conforming to the syllabus prescribed by the College of Radiographers
• Dental hygienists/therapists - equivalent training to nurses or Dentists?

OPERATORS INVOLVED IN PROCESSING/QA

• Dental nurses and other DCPs should possess the Certificate in Dental Nursing or have received adequate and documented training specific to the tasks that they undertake

CONTINUED PROFESSIONAL DEVELOPMENT

CPD mandatory under IR(ME)R for all practitioners and operators involved in radiographing patients

Dental radiography and radiation protection recommended by the GDC in 2006 as one of 3 'core subjects' for dentists requiring 5 hours of verifiable CPD within the 5 yearly CPD cycle

Operators should attend a continuing education course every 5 years

© Barbara H Lamb 2017
Dental radiography and radiation protection recommended by the GDC as a 'core' CPD subject for registered DCPs every 5 years from August 2008

PRACTITIONER COURSES:

• Principles of radiation physics
• Risks of ionising radiation
• Radiation doses in dental radiography
• Factors affecting doses in dental radiography
• Principles of radiation protection
• Statutory requirements
• Selection criteria
• Quality assurance

OPERATOR COURSES:

• Principles of radiation physics
• Risks of ionising radiation doses in dental radiography
• Factors affecting dose in dental radiography
• Principles of radiation protection
• Statutory requirements
• Quality assurance

Recommended publications:

• Selection Criteria for Dental Radiography

© Barbara H Lamb 2017
Published By: Faculty of General Dental Practitioners (UK)
Royal College of Surgeons of England

- Guidance Notes for Dental Practitioners on the Safe Use of X-Ray Equipment
  Published by: National Radiological Protection Board

- Orthodontic Radiographs Guidelines
  Published by: British Orthodontics Society

- Guidelines on Radiology Standards for Primary Dental Care