

# IRMER

## Ionising Radiation Medical Exposure Regulations

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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***

- *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**

<b>UNDER 10</b>	<b>x 3</b>
<b>10-20</b>	<b>x 2</b>
<b>20-30</b>	<b>x 1.5</b>
<b>30-50</b>	<b>x 0.5</b>
<b>50-80</b>	<b>x 0.3</b>
<b>OVER 80</b>	<b>Negligible</b>

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

- 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*

## DEFINES 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)
- Panoramic 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**

## **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**



## 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

- 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

*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**

*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