41st Meeting of the Radiation Safety Standards Committee
21 – 24 November 2016

Agenda Item: R5.3

Development of a Safety Report on Radiation Protection in Dental Radiology

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Background

• Dental X-ray examinations
  – Most frequent type of radiological procedure - 13% of the total number of diagnostic radiology examinations on a global scale
  – Estimated annual number is about 520 million*
  – Frequency ranges from <1 per 1000 population per year (in healthcare IV countries) to > 800 per 1000 population per year (average 310 per 1000 in healthcare I countries)*

• More frequently performed on younger individuals

• Small individual doses, but increasing contribution to the collective doses due to:
  – Increasing frequency
  – Increasing use of Cone Beam Computed Tomography (CBCT)

Background

- Dental X-ray examinations

  Intraoral x-rays
  Individual doses <1 – 8 μSv
  (89-90% of all dental x-rays)

  Panoramic radiography
  Individual doses 4–30 μSv

  Cephalometric radiography
  Individual doses 5-10 μSv

  Cone Beam CT
  Individual doses 60-1000 μSv
Background

• Dentistry is an independent healthcare specialty
• Dental X-ray equipment is often owned by dentists:
  – The same person is the referral and practitioner (self-referral)
  – Responsibility for justification of medical exposure and for optimization of radiation protection of patients (BSS)
  – Need specific and detailed guidelines on justification and optimization
  – The available international guidelines for radiation protection in dental radiology are either outdated or only partly cover existing dental techniques (particularly CBCT)
Justification for the production of the document

- GSR Part 3 and the Safety Guide on Radiation Protection and Safety in Medical Uses of Ionizing Radiation (DS399)
  - do not deal with specific needs of guidelines on radiation protection associated with the use of ionizing radiation in dental radiology
- The IAEA meeting of experts in February 2016:
  (with representatives of leading professional societies)
  - advised on the need of a publication detailing justification and appropriateness of dental radiology imaging, optimisation of radiation protection and safety for patient and staff, including safety aspects of dental facilities and equipment
- Publication in the Safety Report series
Objective

- To provide guidance on meeting the requirements for radiation protection and safety in uses of ionizing radiation in dentomaxillofacial radiology as established in GSR Part 3, including:
  - guidelines for justification and appropriateness of medical exposure;
  - guidelines for optimisation of radiation protection and safety for patient, carers and comforters, and dental staff, including equipment factors, quality assurance, dosimetry and operational consideration;
  - protection of children and pregnant patients.
Scope

• To provide specific guidelines for ensuring radiation protection in uses of ionizing radiation in dentomaxillofacial radiology.
• The target audience is dentists, referring medical practitioners, radiographers, medical physicists, radiation protection experts, and regulators.
Cooperation

The cooperation in developing the Safety Report is expected from:

– IAEA Department of Human Health
– World Health Organization
– World Dental Federation
– International Association of Dento-Maxillofacial Radiology
– International Organization for Medical Physics
– Alliance for Radiation Safety in Pediatric Imaging.
Structure

1. Introduction
2. Imaging modalities and techniques used in dental radiology
3. Framework for radiation protection in dental radiology
   3.1. Radiation dose and risk
   3.2. Basic principles
   3.3. Responsibility for radiation protection
   3.4. Education and training
   3.5. Quality assurance and quality audit
4. Justification and referral guidelines (Grouped by clinical scenarios; in tabulated/flowchart view)
5. Optimization of protection (medical exposure)
   5.1. Equipment selection
   5.2. Quality control
   5.3. Patient dosimetry and DRL
   5.4. Procedural aspects (by modality)
   5.5. Paediatric patients
   5.6. Pregnant female patients
   5.7. Carers and comforters and volunteers in biomedical research
6. Occupational and public protection
   6.1. Classification of areas
   6.2. Design of rooms
   6.3. Protection for adjacent areas
   6.4. Local rules and procedures
   6.5. Personal monitoring
7. Annexes
8. References
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Action requested from RASSC

• No actions, for information