

IAEA Safety Report and resources on Radiation Protection in Dental Radiology

Jenia Vassileva

Radiation Protection Specialist

Radiation Protection of Patients Unit

IAEA, Vienna, Austria

- ♦ World's centre for cooperation in the nuclear field
- ♦ Seeks to promote the safe, secure and peaceful use of nuclear technologies
- ♦ Establishes standards of safety and provides for the application of these standards



Application of safety standards



IAEA Safety Standards
for protecting people and the environment

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

Jointly sponsored by
EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO

General Safety Requirements Part 3
No. GSR Part 3

IAEA
International Atomic Energy Agency

IAEA Safety Standards
for protecting people and the environment

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

Jointly sponsored by
IAEA, WHO

Specific Safety Guide
No. SSG-46

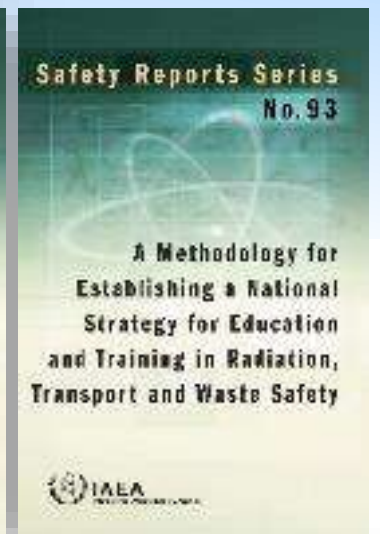
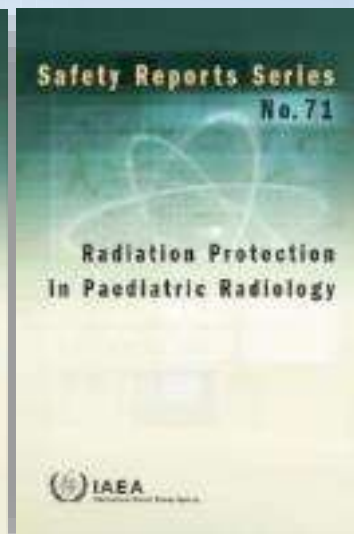
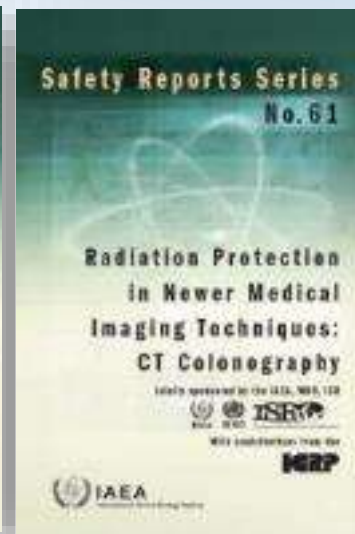
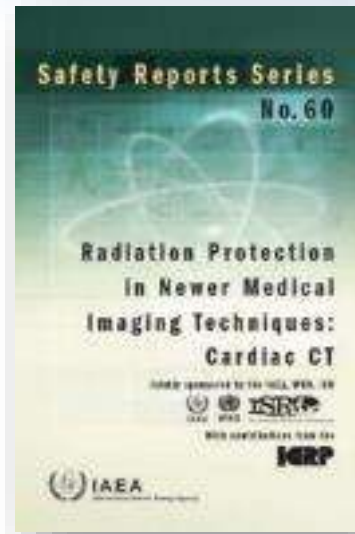
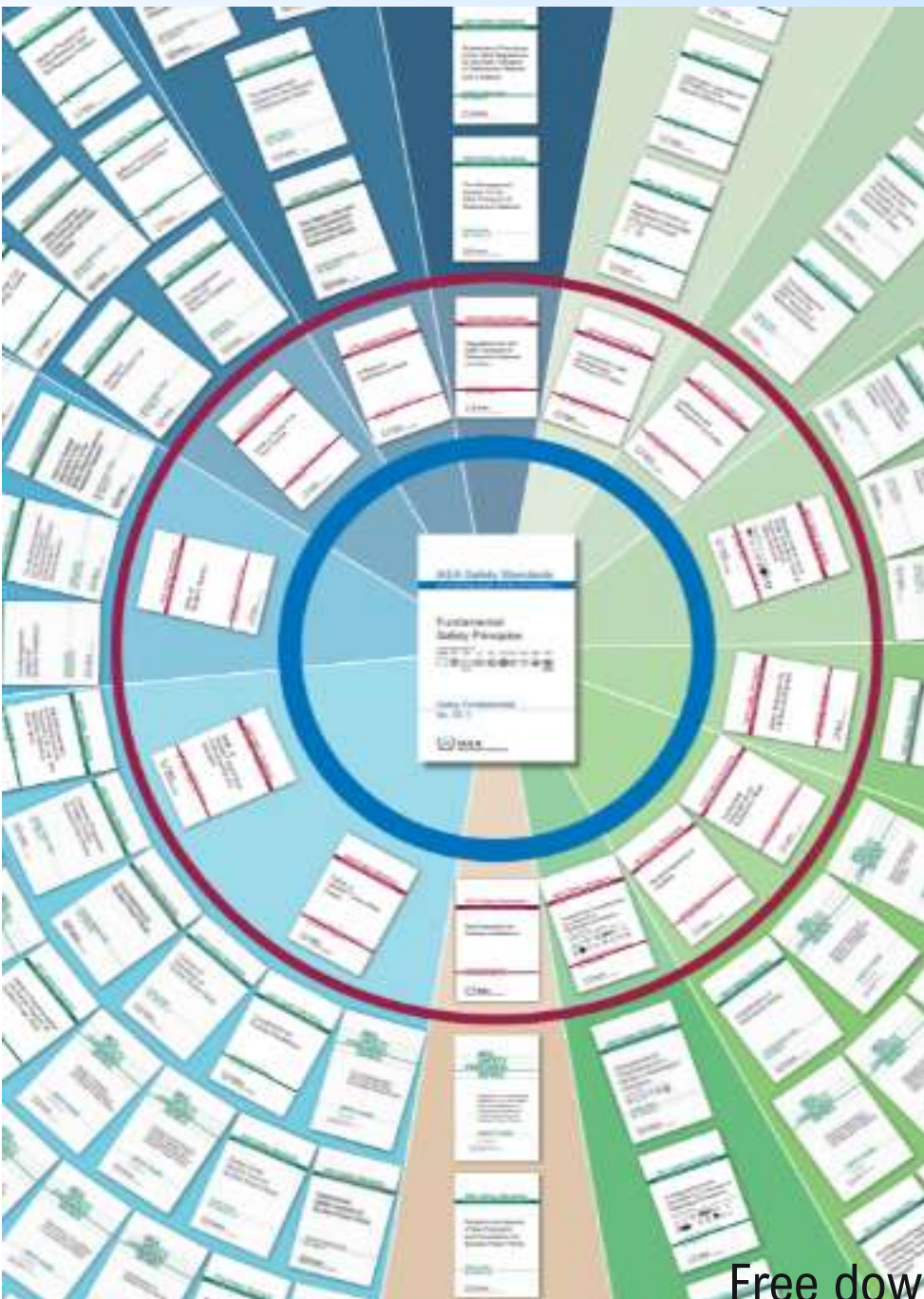
IAEA
International Atomic Energy Agency



IAEA **World Health Organization**

BONN CALL FOR ACTION
10 Actions to Improve Radiation Protection in Medicine in the Next Decade

Guidance – Safety series

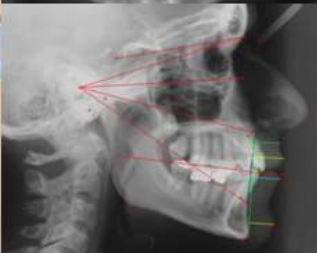


Free download at http://www-pub.iaea.org/books/IAEABooks/Serial_Publications

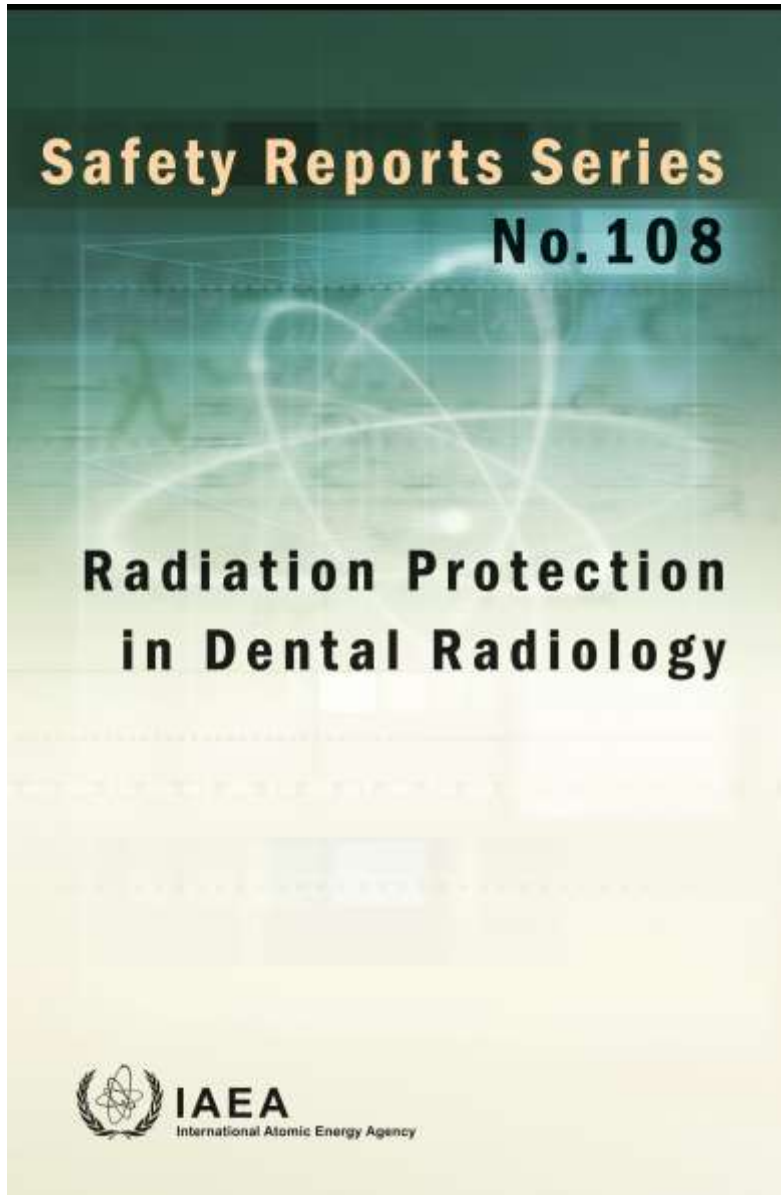
Radiation Protection in Dental Radiology



- The IAEA meeting of experts in February 2016 advised on the need for guidance on the radiation protection and safety in dental radiology.
- Motivated by the global increase of dental X-ray, with **over one billion dental X-rays performed each year - 26 %** of all global diagnostic radiological examinations in 2020, **double** the 2008 estimate.
- Increased use of **CBCT and CT** and their contribution to collective dose

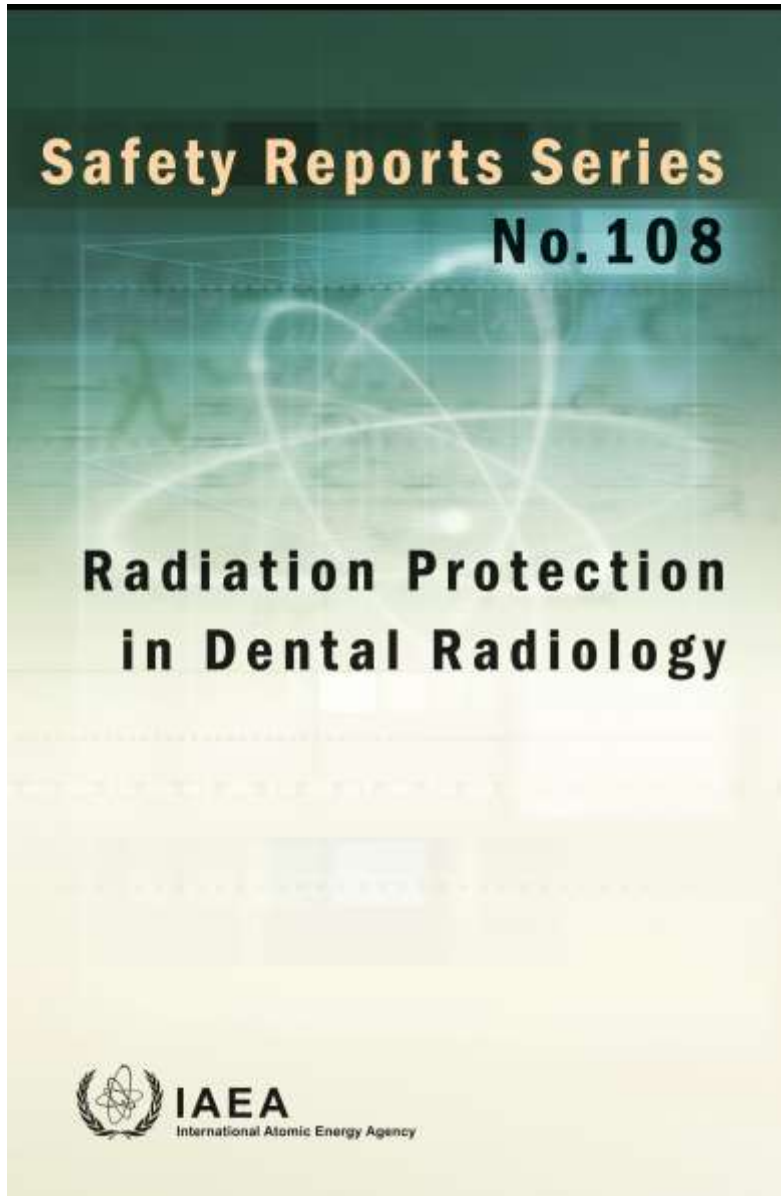


IAEA Safety Report No.108



- **Purpose:** to provide guidance on meeting the requirements of GSR Part 3 for radiation protection and safety in the use of ionizing radiation in dental radiology, complementing and detailing the recommendations of SSG-46.
- **Intended audience:** dentists, dental specialists, other dental professionals, referring medical practitioners (e.g. physicians, dentists), medical radiation technologists (e.g. radiographers), medical physicists, radiation protection experts, manufacturers and regulatory bodies.

IAEA Safety Report No.108



CONTRIBUTORS TO DRAFTING AND REVIEW

Delis, H.	International Atomic Energy Agency
Horner, K.	The University of Manchester, United Kingdom
Jacobs, R.	Catholic University of Leuven, Belgium
Parker, M.	University of the Western Cape, South Africa
Pauwels, R.	Catholic University of Leuven, Belgium
Pérez, M.	World Health Organization
Potluri, A.	University of Pittsburgh School of Dental Medicine, United States of America
Schulze, D.	Digitales Diagnostikzentrum, Germany
Schulze, R.	Johannes Gutenberg-Universität Mainz, Germany
Strauss, K.	Cincinnati Children's Hospital Medical Center, United States of America
Tabakov, S.	King's College London, United Kingdom
Tsapaki, V.	Konstantopoulio General Hospital, Greece
Vassileva, J.	International Atomic Energy Agency

IAEA Safety Report No. 108



IAEA

International Atomic Energy Agency

TOPICS ▾

SERVICES ▾

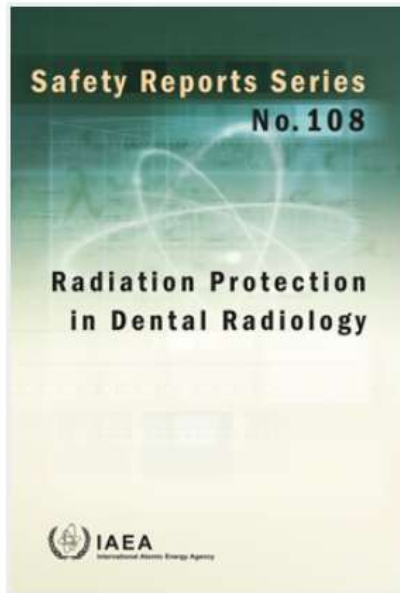
RESOURCES ▾

NEWS & EVENTS ▾

ABOUT US ▾

Home / Publications / Radiation Protection in Dental Radiology

Radiation Protection in Dental Radiology



Safety Reports Series No. 108

English STI/PUB/1972 | 978-92-0-138421-8

109 pages | € 40.00 | Date published: 2022

 [Download PDF \(3.12 MB\)](#)

 [EPUB format available \(7.96 MB\)](#)

 [Get citation details](#)

- Published May 2022
- Most visited IAEA publication in May
- Freely available for download from the IAEA website in PDF and EPUB

<https://www.iaea.org/publications/14720/radiation-protection-in-dental-radiology>



Free training material

<https://www.iaea.org/resources/rpop/resources/training-material#12>

Training material

- [Diagnostic and interventional radiology →](#)
- [Digital radiology →](#)
- [Paediatric radiology →](#)
- [Radiation dose management in computed tomography \(CT\) →](#)
- [Radiotherapy →](#)
- [Radiotherapy: Prevention of accidental exposure →](#)
- [Safety and quality in radiotherapy →](#)
- [Nuclear medicine →](#)
- [Cardiology →](#)
- [PET/CT →](#)
- [Doctors using fluoroscopy outside radiology \(Urologists, Gastroenterologists, Orthopaedic surgeons etc.\) →](#)
- [Dental radiology →](#)
- [Radiation Safety Culture Trait Talks Handbook →](#)
- [Radiation Protection in Interventional Procedures: Practical Tutorials →](#)



Dental radiology



[Lectures →](#)

[Lectures \(in Spanish\) →](#)

Lectures:

- 01. General Principles of Radiation Protection
- 02. Special Considerations for Radiation Protection in Children
- 03. X-ray Production and Interaction: Image Formation and Image Quality
- 04. General Principles of Film and Digital Radiography
- 05. Fundamentals of Intraoral Radiography
- 06. Fundamentals of Panoramic Radiography
- 07. Fundamentals of Extraoral Projectional Radiography
- 08. Fundamentals of CT and CBCT
- 09. Justification and Appropriate Use of Dental Radiology
- 10. Quality Assurance in Dental Radiology
- 11. Optimization of Protection of Patients in Dental Radiology
- 12. Protection of Workers and Public in Dental Radiology

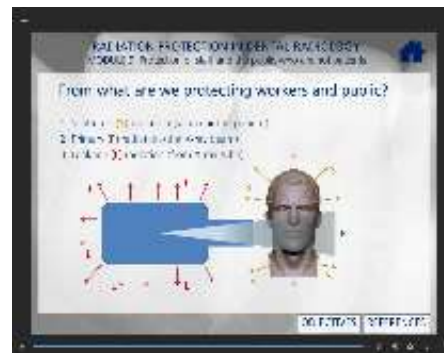
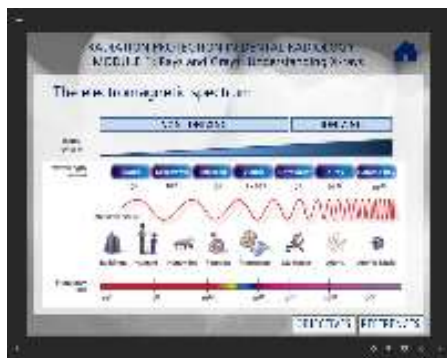
E-learning course

<https://www.iaea.org/resources/rpop/resources/online-training#6>



Radiation Protection in Dental Radiology

- For dentists and other dental professional staff
- 9 modules
- Certificate of completion



Joint webinars with the **International Association of DentoMaxilloFacial Radiology (IADMFR)**

① What can radiobiology bring to dentomaxillofacial radiology? A radiation protection perspective

26 March 2021
Dr. Sarah Baatout
(CCK CEN, Belgium)



② Improved justification and optimization of dental 2D and 3D imaging through education and training

26 March 2021
Dr. Eva Levring Jäghagen
(Umeå University, Sweden)



③ Image Quality vs. Radiation Dose in Dental Radiology: the Multifold Role of Artificial Intelligence


22 October 2021
Dr. Ruben Pauwels
(Aarhus University, Denmark)



Frequently asked questions

For health professionals

Home / Resources / Radiation Protection of Patients / Health professionals



Radiation Protection of Patients (RPOP)

Radiation protection in dental radiology

Health professionals


- RPOP Home
- Radiology
- Radiotherapy
- Nuclear medicine
- Interventional procedures
- Dentistry**
 - Patients
 - Staff
 - Pregnant women
 - Radiation doses
 - Justification
 - Optimization
- Other specialities and imaging modalities

Dental examinations are the most frequent type of radiological procedure, and account for 21% of the total on a global scale. X-rays examinations help dentists to diagnose, plan treatments and monitor both treatments and lesion development.

There are four types of dental radiological procedure - intraoral (bitewing, periapical and occlusal) radiography, panoramic radiography, cephalometric radiography, and cone-beam CT (CBCT). Individual doses are small but collective doses cannot be ignored due to the high volume of procedures. The estimated annual number of dental examinations is about 520 million, with a frequency ranging from less than one to more than 800 per 1000 population per year.


Related resources

- Other specialities and imaging modalities



For patients and public

Home / Resources / Radiation Protection of Patients / Patients and public



Radiation Protection of Patients (RPOP)

X-rays - what patients need to know

Patients and public


- RPOP Home
- About radiation
- X-rays**
- Computed Tomography (CT)
- Interventional procedures
- Nuclear medicine
- Radiotherapy
- Brachytherapy
- Pregnant women
- Children

Frequently asked questions

- What are X-rays and what do they do?
- How safe are X-rays?
- What are the possible effects of radiation on my health?
- Which procedures are associated with higher radiation doses?
- How much radiation is acceptable?
- How do I know if the X-ray facility is safe to perform the procedure?
- How will I know if I am getting the radiation dose that is needed and no more?
- Can I avoid unnecessary repeat investigations?
- Do I become radioactive after an X-ray procedure?
- How does my doctor select the most appropriate investigation/procedure?
- What alternative investigations are available that do not use X-rays or radioactivity?
- How do doses and risk from nuclear medicine compare to X-rays?
- Can I undergo X-ray investigations while I am pregnant?

Related resources

- X-rays - What patients need to know



Thank you!



<http://rpop.iaea.org>