

IAEA resources for Radiation Protection of Patients

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IAEA statutory function

To establish
standards of
safety

To provide for the
application of these
standards

Safety Fundamentals

Principles

IAEA Safety Standards
for protecting people and the environment

Fundamental
Safety Principles

Jointly sponsored by
EC PAO IAEA ILO OECD NEA UNEP WHO
IAEA

Safety Fundamentals
No. SF-1



Safety Requirements

"Shall"

IAEA Safety Standards
for protecting people and the environment

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

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IAEA

General Safety Requirements Part 3
No. GSR Part 3



Safety Guides

"Should"

IAEA Safety Standards
for protecting people and the environment

Radiation Protection and
Safety in Medical Uses
of Ionizing Radiation

Jointly sponsored by
IAEA UNEP WHO

Specific Safety Guide
No. SSG-46

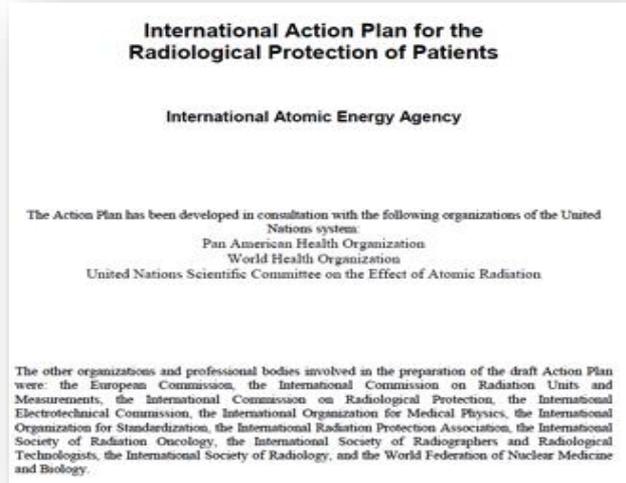


Radiation Protection of Patients



The International Action Plan (2002)

- Born in the Málaga Conference (2001)
- Requested by the IAEA GC (1999)
- Steering Panel set up to review the implementation



Bonn Call to Action (2012)

- Bonn Conference (2012), organized by the IAEA in cooperation with WHO
- Vienna Conference (2017), organized by the IAEA in cooperation with WHO, PAHO

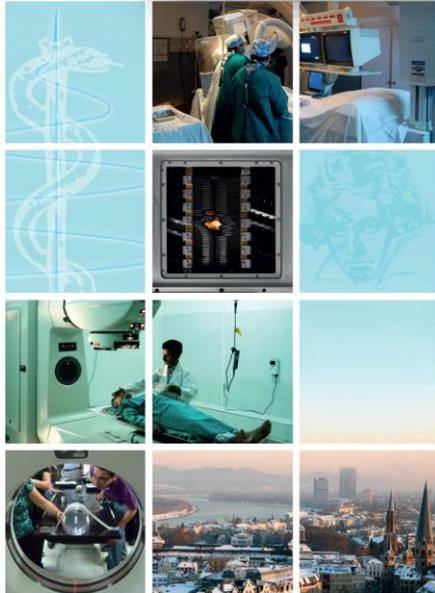


BONN CALL FOR ACTION
10 Actions to Improve Radiation Protection
in Medicine in the Next Decade

Bonn Call to Action



10 actions to improve radiation protection in medicine in the next decade



1. Enhance the implementation of the principle of **justification**
2. Enhance the implementation of the principle of **optimization** of protection and safety
3. Strengthen **manufacturers' role** in contributing to the overall safety regime
4. Strengthen radiation protection **education and training** of health professionals
5. Shape and promote a **strategic research agenda** for radiation protection in medicine
6. Increase availability of **improved global information** on medical exposures and occupational exposures in medicine
7. Improve **prevention of medical radiation incidents and accidents**
8. Strengthen radiation **safety culture** in health care
9. Foster an improved radiation **benefit-risk-dialogue**
10. Strengthen the **implementation of safety requirements** globally

BONN CALL FOR ACTION

10 Actions to Improve Radiation Protection
in Medicine in the Next Decade

International conference

11-15 December 2017, Vienna



International Conference on RADIATION PROTECTION IN MEDICINE

Achieving Change in Practice

11-15 December 2017
Vienna, Austria



Organized by the **IAEA** 60 Years
Co-organized by the **World Health Organization**
and the **Pan American Health Organization**



Achieving Change in Practice

5 years later: Take stock of the implementation of the Bonn Call for Action.

- What worked?
- What didn't work?
- What can we and other stakeholders do better?

Co-sponsors:

WHO	World Health Organization
PAHO	Pan American Health Organization

Co-operating organizations:

AAPM	American Association of Physicists in Medicine
CRCPD	Conference of Radiation Control Program Directors
EC	European Commission
EFOMP	European Federation of Medical Physics
ESR	European Society of Radiology
ESTRO	European Society for Radiotherapy and Oncology
ICRP	International Commission on Radiological Protection
ICRU	International Commission on Radiation Units and Measurements
Image gently	The Alliance for Radiation Safety in Pediatric Imaging
IOMP	International Organization for Medical Physics
IRPA	International Radiation Protection Association
ISR	International Society of Radiology
ISRRT	International Society of Radiographers and Radiological Technologists
SNM	Society of Nuclear Medicine
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation

International cooperation

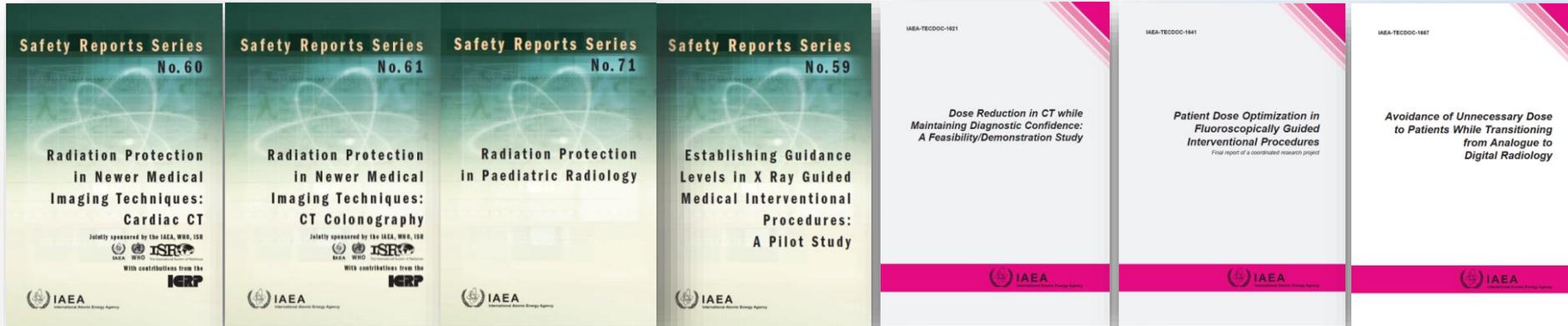


- In cooperation with many international organizations and professional societies



Specific guidance

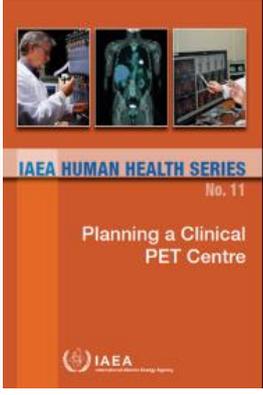
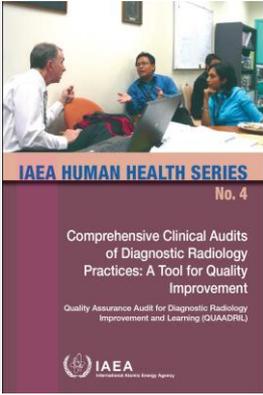
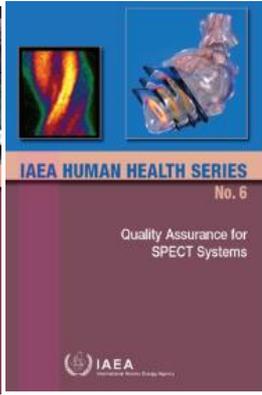
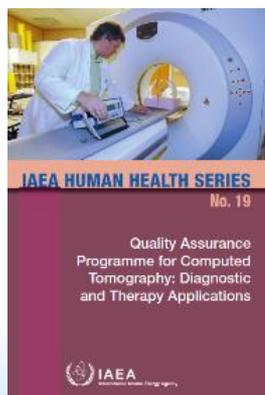
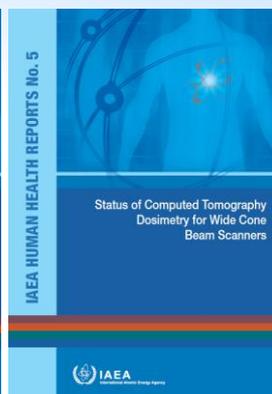
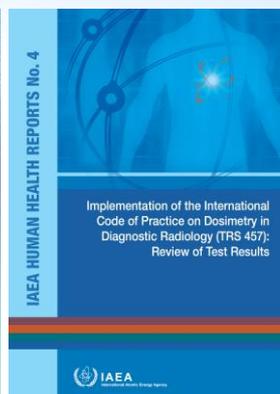
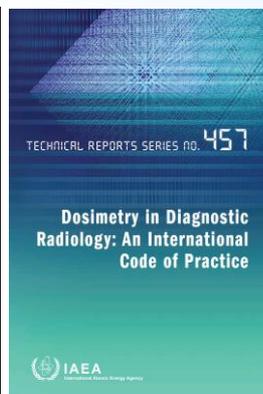
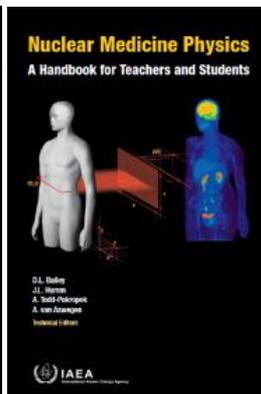
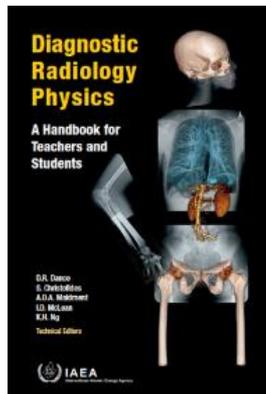
Specific guidance on implementation of standards (Safety Reports, TechDocs)



- **New under development:**

- Radiation Protection in Dental Radiology (with WHO, FDI, IADMR, IOMP, Image Gently)
- Patient Radiation Exposure Monitoring in Medical Imaging (with ICRP, WHO, UNSCEAR, IOMP, DICOM WG28)

IAEA Publications to support diagnostic optimization



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

Technical meetings



2017:

- Preventing Unintended and Accidental Medical Exposures in Radiology
- Strengthening safety culture in radiotherapy through the use of incident learning systems

2018:

- Preventing Unintended and Accidental Exposures in Nuclear Medicine
- Experiences in the Implementation of the Bonn Call for Action
- Safety Culture Learning in Medical Uses of Radiation

2019:

- Radiation Exposure of Patients from Recurrent Radiological Imaging Procedures
- Meeting of SAFRON users



Technical cooperation (TC) programme



Helps to transfer nuclear and related technologies for peaceful uses to countries

- ◆ National projects
- ◆ Regional projects
- ◆ Interregional projects

◆ Human Health

- Food and Agriculture
 - Water Management
 - Environment
 - Industry
 - Nuclear Energy
- Safety and Security



Providing training

Training courses and workshops

- Regional training courses
- National training courses
- Inter-regional course

In 2019:

48 regional and national training courses and workshops with **1450** participants



IAEA online resources on radiation protection



Information
for health
professionals
and public

News
Publications

Posters

Databases

Training
packages

E-learnings

Webinars

All resources available at <http://rpop.iaea.org>

Public website <http://rpop.iaea.org>



Home / Resources / Radiation Protection of Patients / Resources

Radiation Protection of Patients (RPOP)

Radiation Protection of Patients (RPOP) – the leading resource for health professionals, patients and public on the safe and effective use of radiation in medicine. To access the Spanish version of the site click [here](#).

For health professionals



Health professionals can find answers to frequently asked questions about different medical procedures and the safe use of ionizing radiation in medicine.

For patients and public



Patients, their caretakers, and the public can learn about what to expect during medical examinations that involve ionizing radiation.

Resources

- Training
- Webinars
- Safety in Radiation Oncology (SAFRON)
- Safety in Radiological Procedures (SAFRAD)
- Posters and leaflets
- Publications

Contact

[RPOP Newsletter](#)

Other specialities and imaging modalities

- Radiology
- Radiotherapy
- Nuclear medicine
- Interventional procedures
- Dentistry

X-Rays

- Computer tomography (CT)
- Interventional procedures
- Nuclear medicine
- Radiotherapy
- Brachytherapy

- Leading resource for health professionals, patients and public
 - 500 000 pageviews per year
 - Updated monthly
 - 9 000 subscribers to the monthly newsletter
- Frequently asked questions

Public website <http://rpop.iaea.org>



• Information for health professionals

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Press centre Employment Contact

TOPICS SERVICES RESOURCES NEWS & EVENTS ABOUT US

Search

Home / Resources / Radiation Protection of Patients / Health professionals / Radiology

Radiation Protection of Patients (RPOP)

Radiation protection of children in radiology

Health professionals

RPOP Home

- Radiology
 - Responsibilities of health professionals
 - Children**
 - Pregnant women
 - Cataract
 - Erythema
 - Diagnostic Reference Levels (DRLs)
 - Radiography
 - Mammography

The optimization of protection in children's radiology examinations requires the use of examination-specific protocols tailored to the patient's age and size, the region of imaging and clinical indication. This ensures that the dose to each patient is as low as reasonably achievable for the clinical purpose of the examination.

Frequently asked questions by the health professionals

- Which radiology examinations contribute most to individual patient dose and collective population dose in children?
- Are there special technical considerations required to reduce patient exposure and maintain good image quality in paediatric radiography?
- How does the radiation dose in screen-film combination imaging compare to digital imaging in paediatric radiography?
- Can low dose fluoroscopic image replace conventional radiographic

Related resources

- Diagnostic Reference Levels (DRLs) in paediatric radiology

Training resources

- Diagnostic and interventional radiology
- Paediatric radiology
- Outreach materials about radiation protection

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TOPICS SERVICES RESOURCES NEWS & EVENTS ABOUT US

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Radiation Protection of Patients (RPOP)

Radiation protection of pregnant women in radiology

Health professionals

RPOP Home

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 - Erythema
 - Diagnostic Reference Levels (DRLs)
 - Radiography
 - Mammography

Frequently asked questions by the health professionals

Patient exposure

- Is there a safe level of radiation exposure for a patient during pregnancy?
- What is the ten-day rule and what is its status?
- Should pregnancy be terminated after radiation exposure?

Undergoing medical examinations in pregnancy

- What if a patient underwent an abdomen CT before realizing that she is pregnant?
- How safe are radiological examinations of chest and extremities in pregnancy?
- Can cardiac catheterization be performed on a pregnant patient?
- Can the patient become sterile after undergoing a diagnostic X-ray?

Related Stories

- Protecting Patients: Promoting Safety Culture in Diagnostic Imaging

Related resources

- Medical Imaging in Pregnancy
- Pregnancy and medical radiation, International Commission on Radiological Protection (ICRP)

Training resources

- Diagnostic and interventional

Public website <http://rpop.iaea.org>



• Information for patients and public

The screenshot shows the top navigation bar with the IAEA logo and links for Press centre, Employment, and Contact. Below the navigation is a search bar and a breadcrumb trail: Home / Resources / Radiation Protection of Patients / Patients and public. The main header image features a child and a healthcare professional, with the text 'Radiation Protection of Patients (RPOP)'. The main title is 'Children and radiation - what patients need to know'. The page is divided into three columns: 'Patients and public' with a sidebar menu, 'Frequently asked questions by the health professionals' with two questions, and 'Related resources' with three links.

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Press centre Employment Contact

TOPICS SERVICES RESOURCES NEWS & EVENTS ABOUT US Search

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

Radiation Protection of Patients (RPOP)

Children and radiation - 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 by the health professionals

- » [Should I be concerned about radiation if my child has been prescribed a CT?](#)
- » [Should I be concerned about radiation if my child has been prescribed an interventional procedure?](#)
- » [Should I be concerned about radiation if my child has been prescribed a CT?](#)

As part of the justification process, doctors determine whether the benefits of the CT scan outweigh the risks, and they should be able to explain why your child needs a CT scan. Children's radiation exposure should be as low as possible because they are more sensitive to radiation than adults and they a longer life ahead of them.

Related resources

- Safe Medical Imaging for Children
- Radiation protection of children in radiology
- Radiation protection of children

The screenshot shows the top navigation bar with the IAEA logo and links for Press centre, Employment, and Contact. Below the navigation is a search bar and a breadcrumb trail: Home / Resources / Radiation Protection of Patients / Patients and public. The main header image features a pregnant woman, with the text 'Radiation Protection of Patients (RPOP)'. The main title is 'Pregnancy and radiation - what patients need to know'. The page is divided into three columns: 'Patients and public' with a sidebar menu, 'Frequently asked questions' with five questions, and 'Related resources' with two links.

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TOPICS SERVICES RESOURCES NEWS & EVENTS ABOUT US Search

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

Radiation Protection of Patients (RPOP)

Pregnancy and radiation - 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

- » [Can I undergo X ray investigations while I am pregnant?](#)
- » [How long after radioiodine treatment should I wait before getting pregnant?](#)
- » [Can I breastfeed following radio-iodine treatment?](#)
- » [Can a pregnant patient receive radiotherapy?](#)
- » [Can I undergo a CT scan while I am pregnant?](#)
- » [Is it important to know if I am pregnant for undergoing a CT scan?](#)
- » [Can I undergo X ray investigations while I am pregnant?](#)

Yes, if medically justified and with certain precautions. The aim is to minimize the unborn child's radiation exposure. An unborn child is considered to be more sensitive than adults or children to potential

Related resources

- Medical Imaging in Pregnancy
- X rays - What patients need to know

Bonn Call for Action Platform



- Link to the conference presentations
- Proceedings of the International Conference
- Joint Position Statement (in English, Spanish, Portuguese, Russian)
- Brochure on the Bonn Call for Action (in English and Portuguese)
- Internet Links to Activities related to the Bonn Call for Action: WHO, EC, ISR, ISRR, UNSCEAR, ESR, HERCA, FDI, FDA, AFROSAFERAD



Resources

- 🏠 RPOP Home
- > International Safety Standards
- > Publications
- > Posters and leaflets
- ▼ Bonn Call for Action platform
 - > Activities related to Bonn Call for Action
- > Smart Card
- > RELID Study
- > Training material
- ▼ Webinars

The Bonn Call for Action seeks to foster coordinated work to address issues arising in radiation protection in medicine. It was issued at an IAEA-organized 2012 international conference held in Bonn, Germany, and strengthened at the follow-up conference in Vienna, Austria in 2017. The 2012 conference aimed to:

- indicate gaps in current approaches to radiation protection in medicine;
- identify tools for improving radiation protection in medicine;
- review advances, challenges and opportunities in the field of radiation protection in medicine;
- assess the impact of the International Action Plan for the Radiation Protection of Patients, in order to prepare new international recommendations, taking into account newer developments.

Related Stories

- IAEA Conference Identifies Challenges in Radiation Protection in Medicine
- Director General's Remarks at Conclusion of International Conference on Radiation Protection in Medicine

Related resources

- 🔗 International Conference on Radiation Protection in Medicine: Achieving Change in Practice, presentations and photos

IAEA free training resources



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

12 free training packages

- Power Point slides
- Material reflects IAEA standards and international consensus
- All available in English, some in Spanish and Russian
- For free download and use
- Adapt to your needs and use

Training material

[Diagnostic and interventional radiology](#) →

[Digital radiology](#) →

[Paediatric radiology](#) →

[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](#) →

E-learning

Launched end 2016



In English and Spanish



In English and Spanish



One module in English
More to come

- >10000 users
- Translation to Russian and French

New under development
(2019-2020)

- Diagnostic Reference Levels
- Radiation Protection in Dental Radiology (for dentists and other dental professional staff)
- Radiation Protection in Interventional Procedures (video-tutorials)
- Dose management in CT (new modules)
- E-learning based on webinars

Free webinars

Online seminars on topics in radiation protection in medical uses of ionizing radiation

- 33 webinars broadcasted
- In English, Spanish, Russian, Portuguese
- >10,000 participants from over 90 Member States attended
- Recorded webinars available for viewing from:
<https://www.iaea.org/resources/rpop/resources/webinars>



The screenshot displays a webpage titled "Webinars in radiation protection". At the top, there is a banner image showing a group of people in a classroom or seminar setting, with a presenter at the front and participants at computers. Below the banner, the page is organized into a "Resources" sidebar on the left and a main content area on the right. The sidebar lists various resources such as "RPOP Home", "International Safety Standards", "Publications", "Posters and leaflets", "Bonn Call for Action platform", "Smart Card", "RELID Study", "Training material", "Webinars" (which is highlighted), "Online Training", and "Databases and Learning Systems". The main content area features a search bar and a grid of webinar listings. Each listing includes a date, a title, and a small thumbnail image. The visible listings are: "16 October 2018: Dose and quality assessment of X-ray devices for interventional angiography and cardiology", "6 September 2018: Radiation protection in interventional radiology: practical hints and tricks", and "20 June 2018: Dicas e Truques em TC".

Safety reporting systems



SAFRON: Safety in Radiation Oncology



The screenshot shows the SAFRON website homepage. At the top, there is a navigation bar with the IAEA logo and the text "SAFRON Safety Reporting and Learning System for Radiotherapy". A "Select Dataset" dropdown menu is set to "All incident reports". Below the navigation bar, there is a main content area with a featured article titled "Safer use of radiation in radiotherapy through learning and reporting". To the right of this article is a "New User?" section with a "Request Registration" button. Below the main article, there are two columns: "Featured Incident Reports" and "Featured Documents & Links". At the bottom of the page, there is a footer with a link to the Radiation Protection of Patients Website (RPOP).

SAFRAD: Safety in Radiological Procedures



Safety in Radiological Procedures

The IAEA has a sub-programme on Radiation Protection of Patients that operates under an [International Action Plan](#). This is the first ever programme dedicated to radiation protection of patients started in 2001 by an international organization. A dedicated [website](#) was established in September 2006 that is becoming a popular resource for credible information for health professionals, patients and public.

The website provides information on radiation safety in interventional procedures besides other areas in radiology, radiotherapy, nuclear medicine, dental radiology, pregnancy and for children. Also training material has been provided for free download for use by health professionals.

SAFRAD (SAfety in RADiological procedures) is a voluntary reporting system where patient's dose report and relevant data are included in an international database when these patients are submitted to defined [trigger levels](#) or events in fluoroscopically-guided diagnostic and interventional procedures. The primary objective of the system is educational in nature. It is believed that going through the process of SAFRAD itself results in safety and quality of service. For more information about SAFRAD, [click here](#).

The data furnished by participants (hospitals, regulators) will remain accessible to the participant. The participant will have access periodically to analysed results. The IAEA will publish overall summary reports of SAFRAD data from time to time.

SAFRAD will not supply identifiable data to any governmental authority or other third party.

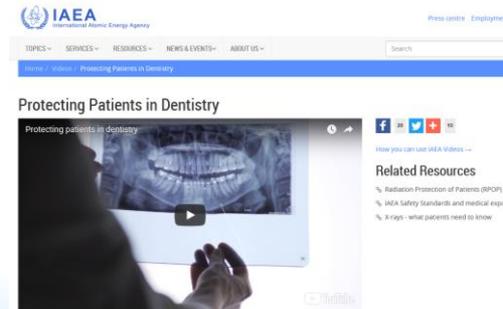
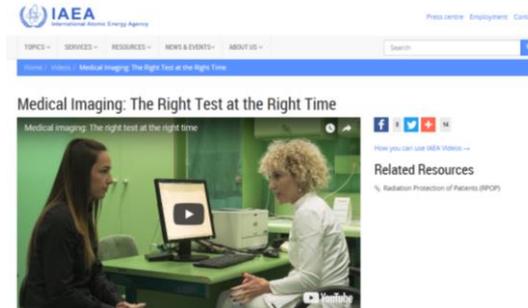
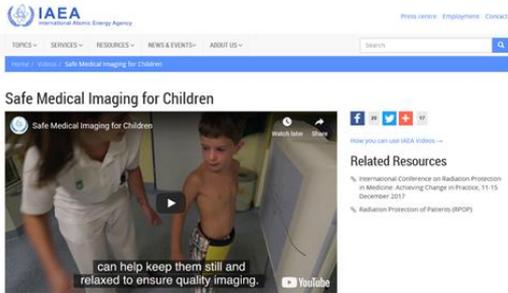


Cardiac Catheterization Lab, San Carlos Hospital, Madrid

Videos for public and professionals



- Some videos also available in Arabic, Chinese, French, Russian and Spanish.
- Some of them featured on the main United Nations Web TV
- Video on Safe Medical Imaging for Children: >105,000 views on Facebook



<https://www.iaea.org/newscenter/multimedia/videos>

IAEA support to implementation



Providing standards

- Safety standards



Providing guidance

- Safety reports
- Technical documents
- Public website



Providing training

- Training material
- Training courses
- E-learning
- Webinars
- Fellowships



Giving technical assistance

- Involve in projects
- Providing tools
- Direct advice
- Assessments, missions



Knowledge exchange

- Meetings, workshops
- Reporting system
- Public website
- Scientific publications



Building awareness

- Information campaigns
- Press campaigns
- Posters



Joint ICTP-IAEA Workshop on Establishment and Utilization of Diagnostic Reference Levels in Medical Imaging



18 - 22 November 2019
Trieste, Italy



IAEA
International Atomic Energy Agency
Atoms for Peace and Development



AMERICAN ASSOCIATION
of PHYSICISTS IN MEDICINE



EFOMP



Objective of the workshop

To contribute to the knowledge improvement on the concept of DRLs, dose monitoring and their use for optimization, in line with the international requirements and good practice



What did you learn?

What next?

What you will do next?



What you will do next?

