



**60 Years**  
*Atoms for Peace and Development*

# Factsheet for Decision Makers

## Radiation Protection of Patients

## RADIATION PROTECTION IN IMAGE GUIDED INTERVENTIONAL PROCEDURES

### Why is it important?

The benefits of image guided interventional procedures in radiology, cardiology, and other areas of medicine are well recognized. During these procedures, medical staff take positions close to the patient where dose rates may be significant. Both patient and staff exposures are therefore of concern when utilizing ionizing radiation for medical purposes.

Radiation protection of both patients and staff in interventional procedures is focused on the prevention of both cancer risks and tissue reactions such as skin injuries.

Skin injuries to staff may occur if the operator's hands are often placed in the primary radiation beam. Staff who do not use adequate eye protection may face risks of developing eye lens opacities.

### What do I need to know?

Justification and optimization are the two cornerstones of radiation protection of patients. Dose limits do not apply in medical exposures as they may limit the benefits to the patient. Dose limits apply to occupational and public exposure only.

The process of justification allows determining whether the exposure will take place or not. Once justified, the procedure should be optimized and performed such that the exposure of the patient is managed in order to achieve the medical objective.



**The International Basic Safety Standards (BSS) are the international benchmark for radiation safety. The BSS are used in many countries as the basis for national legislation to protect workers, patients, the public and the environment from the risks of ionizing radiation.**

### 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



**The BSS are based on the most recent scientific evidence on the effects of ionizing radiation and take into account practices and experiences from around the world in the use of ionizing radiation and nuclear techniques. Eight international organizations sponsor the BSS.**

### What actions are required?



The government is responsible for establishing and implementing a legal and regulatory framework for radiation protection in medicine.

The regulatory body is responsible for establishing requirements and guidelines, authorization and inspection, and for enforcing legislative and regulatory provisions.

The hospital management has a prime responsibility for safety and for establishing and implementing a radiation safety programme.

Medical staff is responsible for the overall protection, both for patients and for themselves, in the delivery of medical exposures.

### Pay particular attention in image guided interventional procedures to:

- Optimization of protection and safety, considering:
  - ▶ The minimum necessary exposure to the patient to achieve the clinical objective;
  - ▶ Image quality adequate for guiding the medical intervention;
  - ▶ Typical doses to patients for common procedures;
  - ▶ Diagnostic reference levels;
  - ▶ A comprehensive programme of quality assurance.
- Occupational radiation protection in interventional procedures should include:
  - ▶ Appropriate design of facilities and imaging equipment;
  - ▶ Use of personal protective devices and protective tools, as appropriate;
  - ▶ Appropriate individual monitoring;
  - ▶ Local rules and procedures;
- Education and training.



### Resources

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, No. GSR Part 3

[http://www-pub.iaea.org/MTCD/publications/PDF/Pub1578\\_web-57265295.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Pub1578_web-57265295.pdf)

Radiation Protection of Patients (RPoP) website

<https://rpop.iaea.org/RPoP/RPoP/Content/index.htm>