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# International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers — Gaps, Challenges and Developments

## A medical physicist's perspective



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“The number of diagnostic and interventional medical procedures using ionizing radiations is rising steadily, and procedures resulting in higher patient and staff doses are being performed more frequently.” – ICRP 113

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## **In the context of medicine the principles of justification and optimization of protection consider both the dose to the patient and the dose to the staff**

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**For a pregnant staff member**, a restriction to the occupational exposure is introduced, while ethical issues could arise.

**For pediatric patients** the procedures, such as interventional cardiology, could have the characteristics of a higher dose to the staff, compared to adult patients.

An experienced pediatric interventional staff is preferable and additional training in radiation protection is recommended to protect both patients and staff.

Where a reduction of the patient dose can give an increase in the staff dose, or in the opposite situation, ethical issues could arise and **particular attention by medical physicist and by qualified expert** (or by an individual recognized as both) as well as by staff members, it is required.

## The training aspects are an open issue to all professionals

Technicians, nurses and medical specialists, working in interventional radiology, cardiology and in the various specialties, derive benefits from a specific training on their activities and from **consulting advises aimed to optimize aspects and practices of radiation protection addressed to both the patients and the workers.**

There is a concern about possible specialists and staff members in interventional procedures with no proper education and training in radiation protection, in particular outside imaging departments.

**Medical physicists are radiation experts**, since the application of radiation physics in the medical field is a significant part of their specialty [ICRP 113, 2009 EC 175, 2014].

The European Guidelines on Medical Physics Expert [EC 174, 2014] report about the Qualification Framework and Curricula in the Medical Physics area, related to **radiological devices and protection** from ionizing radiation in **diagnostic and interventional radiology, radiation oncology** and **nuclear medicine**.

## The increasing concern about potential radiation deleterious effects has increased the attention for a more adequate RP

Non-cancer radiation risks emphasize the relevance for a reduction of staff dose and patient dose. **Radiation induced cataract** is recognized as potential effects in interventional procedures. Potential **risks for cardiovascular effects** remain still less considered.

*The need for strategies towards "in practice" improvements by the implementation of guidelines proposed and supported through the professional bodies and associations, in cooperation with the international organizations, is already well recognized.*

MEDRAPET EC Project (ESR, EFOMP, EFRS, ESTRO, EANM, CIRSE)

**'Radiation protection education and training are far from being harmonized, and in some instances have not been implemented.'**

EC Guidelines RP Education and Training on Medical Professionals , Publ n. 175, 2014

## There is the need for a deep process of enhancing radiation protection awareness and culture

'Optimization of RP for patients and medical personnel in diagnostic and interventional medical procedures requires the **conviction, engagement, and competent performance** of the medical, radiographic, physics, and technical personnel involved.'

*(ICRP 113, 2009)*

'**A successful sustained positive radiation protection culture takes a comprehensive effort** because the creation of a positive culture encompasses the entire organization, from the top down, and needs to be integrated throughout the organization.'

*(Radiation Protection Culture, IRPA 2014)*

## A real process of integration

There is a need to enable a real process of integration where clinical benefits of the applied procedures:

- take into account the levels of **radiation safety** for patients and staff;
- include the **quality assurance dose assessment** jointly for the staff and for the patient;
- the **radiation protection** for staff and patients are to be seen as a single issue.

## The path forward

The judgment on the conduct of any procedure is made by the physician, after considering all circumstances related to the specific clinical situation. A margin for optimization aimed to reduce doses is considered.

There is a rising demand for the **management of radiation risks for patients and staff, as an integrated approach**, where the medical physicist contributes to the continuous quality improvement of the overall process, by relying on radiation protection culture **within an active and proactive inclusion and participation of the staff.**



***Thank you for the attention***