

## WP 3: Development of a radiation protection culture to support governance of radiological risk

### Synthesis of Lessons learned for RP Culture in the Field of Medical Exposures

13-15 February 2019, Athens, Greece

In **France**, elaboration of a RP training course to be included in the 3rd year of studies of a nurse school.

- Local action implemented at the initiative of the local urban public authority of Montbéliard (Pays de Montbéliard Agglomération - PMA) in the framework of the global radiological protection project (radon management, radiological risks and medical field) with the collaboration of the French Institute for Radiological Protection and Nuclear Safety (IRSN) and the University of Franche-Comté.
- Involvement of the pedagogic staff of the nurse school.
- Involvement of the RPE of the local Hospital.



In **Greece**, specific actions undertaken to build and enhance RP culture among hospital staff involved in fluoroscopy guided medical procedures.

- Actions implemented by the Greek Atomic Energy Commission (EEAE);
- Involvement of related medical professional societies.



In **Italy**, actions undertaken to mitigate the risk of accidental exposures in the field of radiotherapy

- Actions undertaken at the initiative of the Italian Association of Medical Physics.



# Target Stakeholders – Aim of RP Culture



- In the three cases, the target stakeholders are **medical professionals** directly or indirectly involved in medical procedures using ionising radiations.
- According to their specialty, they have different **role** to play regarding the radiological protection of patients and staff, and the aim of developing a RP Culture **varies** accordingly.

## Student nurses (& indirectly school pedagogic staff)

- The aim of RP Culture is to **raise awareness on RP exposure situations** they may encounter on their workplace in order to implement self-protection actions, to understand and apply the relevant radiological protection protocols for the patients, as well as **disseminate RP Culture elements** to their colleagues.
- As these professionals are in direct contact with the patients, the aim is also to give them elements to be able to provide advices and explanations to the patients who might have concerns regarding radiological protection issues.



## Medical professionals participating in fluoroscopy guided medical procedures

- These procedures may lead to high exposure of the patients and also of the participating staff (the specialist and the surrounding staff).
- The aim of RP Culture for these professionals is to **improve their practice** by integrating the radiological risk as an additional criterion in their decision-making process as well as to **understand and implement processes to optimise** the radiological protection of the patients and the whole staff.
- RP culture is also needed to **improve their communication** and work with the QEs on RP issues related to interventional procedures.



## Medical professionals involved in radiotherapy (RT) procedures

- The aim of RP Culture in that case is to **raise awareness** of the various staff involved in RT procedures on the potentiality of incidents/accidents that can give rise to very high exposure of the patients, and thus to develop a structured approach in the different steps of the RT process to identify and analyse adverse events, occurrence rating and potential severity to prevent critical situations.
- The target stakeholders include medical physicists, radiotherapist, and other staff that may be involved on RT procedures.





These case studies allow to analyse three types of actions covering different aspects of RP Culture:

- ***Raising risk awareness for student nurse:*** Case of an initial education for medical professionals who will not be directly involved in medical procedures giving rise to patient and/or staff exposure, but who may be potentially exposed and/or in charge of some protective actions and/or in contact with patients.
- ***Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures:*** Case of a continuous education for medical professionals who are directly involved in medical procedures giving rise to patient and/or staff exposure.
- ***Raising awareness on the potentiality of incidents/accidents for medical professionals involved in radiotherapy (RT) procedures:*** Case of medical professionals involved in high dose procedures, for which the intention is to reinforce the QC and QA processes to prevent incident/accident.

# Characterization of RP Culture

## Raising risk awareness for student nurse:

As an initial training for those type of students, the elements of RP Culture combine knowledge on radiations and associated health effect, overview of the use of ionizing radiations in the medical field, associated exposure levels, means of protection.



## Raising risk awareness for student nurse:

- Definition and identification of radiation sources, health effects (units, radiation sources, radiation health effects) and exposure levels associated with different exposure situations.
- Medical practices using ionising radiation (radiology, interventional radiology, nuclear medicine, radiotherapy).
- Exposure levels for patients and staff related to these practices, other RP aspects (e.g. radioactive waste management)
- Means of protection (for patients and staff).
- Means of exposure evaluation and follow-up.
- RP regulations and RP management at the level of hospital.



# Characterization of RP Culture

## Raising risk awareness for student nurse:

A key element also for this type of training is to provide the possibility to have access to further information (i.e. links to websites, identification of QE in a hospital, ...).



# Characterization of RP Culture

Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

The objective is that these professionals perceive the risk associated with the use of ionising radiation in a more realistic way and that they integrate radiological protection issues when appropriate in the medical procedures.



## Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

- These professionals have usually received an initial training on radiological protection, usually during their first year of study, as well as some element during their undergraduate/post graduate studies for their specialty, the information provided usually covers **only theoretical aspects of RP and not practical ones.**
- Furthermore, this training has been provided for most professionals since many years, and the techniques are evolving quite quickly.



## Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

Continuous education should include theory and practice. The main topics are:

- Physics of ionizing radiations;
- Biological effects of ionising radiations, according to the level of exposure;
- RP regulation, RP principles, specificities of the medical field (risk-benefit);
- Typical levels of patient/staff exposure associated to the different medical procedures;
- How practices can influence these level of exposures;
- Individual and collective means of protection according to medical procedures;
- RP management at the hospital, role of QE;
- Tools facilitating the follow-up of exposures, the measure of performances (notably how to use the Diagnostic Reference Levels or Trigger Levels).

However, they should be adapted to the specialty as well as to the initial knowledge.

## Raising awareness on the potentiality of incidents/accidents for medical professionals involved in radiotherapy (RT) procedures

To raise this awareness, and improve attitudes and behaviours at individual and collective level for the management of RT procedures, the main elements includes:

- Roles and responsibilities of each actor in the treatment processes;
- Aspects of decisions-making processes that can be at the origin of incident/accident;
- Complexity of the considered treatment techniques and potentiality for unexpected high doses;
- QC processes;





# Characterization of RP Culture

Raising awareness on the potentiality of incidents/accidents for medical professionals involved in radiotherapy (RT) procedures

As some staff involved in a RT procedure might not have the same level of knowledge in RP than the radiotherapist or the medical physicist, the organisational and management aspects should be completed with basic knowledge regarding the radiation risks associated with RT treatments.



## Initial training of nurses

The case study highlighted **the deficit of initial training of nurses in RP**. The processes implemented, initiated by local actors (municipality, university, nurse school, local hospital) started with a work with the pedagogic staff of the school to identify the needs and elaborate a programme based on two aspects:

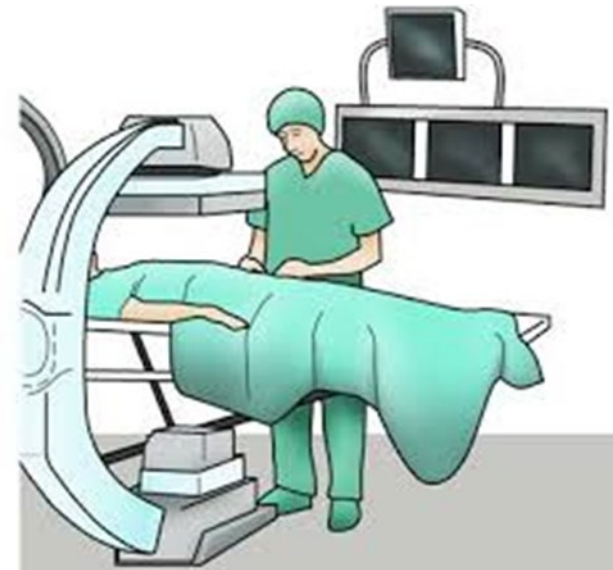
- Initial personnel work by the students, by integrating specific questions into a research project linked with the more global topic of cancer treatment: this allow to initiate an individual questioning regarding these issues.
- Complement with a 2 hours lecture given by a QE of the hospital.



## Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

The actions initiated by the authority can be grouped in  
two main categories:

- Raising awareness through continuous education  
and training
  - Organization and/or participation to seminars  
covering all the aspects of RP (theoretical &  
practical) in fluoroscopically guided  
interventional procedures;
  - Elaboration of training materials covering  
theoretical and practical aspects of RP. To be  
available on line on the Authority website,  
including e-learning part.
  - Approval of RP training programme to be  
provided by the QE for continuous education of  
interventionists.



## Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

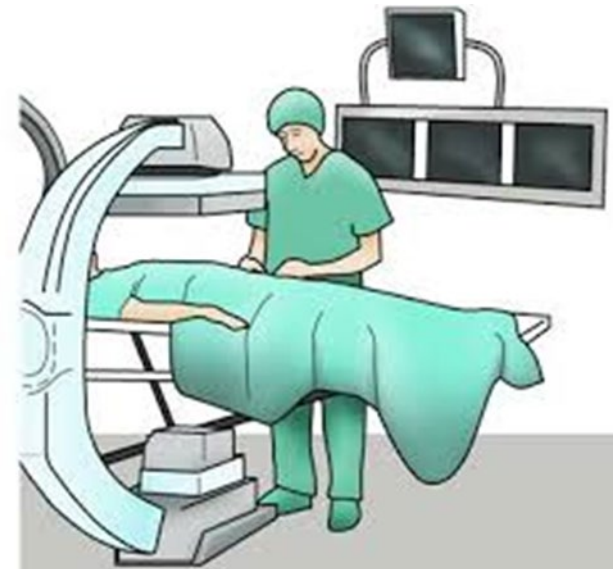
The actions initiated by the authority can be group  
in two main categories:

- Use inspections to foster the awareness of medical professionals on the importance of RP:
  - Define appropriate indexes for the evaluation of the RP culture.
  - Monitor and evaluate in a systematic way the RP culture among interventionists during the on-site inspections.



## Integrating RP as a part of the professional skill of medical professionals participating in fluoroscopy guided medical procedures

- Actions from professional associations are also essential in the process of continuous education. It takes the form of organization of specific seminars.
- Some aspects of work management, or work organization, can also be identified as key elements to integrated RP issues on a day-to-day basis in the medical procedures. For example:
  - The internal evaluation of RP practices by the QE. These evaluations, to be performed in close cooperation with the medical professionals, favours the creation of meeting places where dialogue on RP issues can be addressed.
  - The implementation of QA programmes are key organisational elements to integrate in a formal way the procedures to be applied for the provision of training, information dissemination and the evaluation of practices.



## Raising awareness on the potentiality of incidents/accidents for medical professionals involved in radiotherapy (RT) procedures



- The role of professional association is central. In that case it is the Italian Association of Medical Physics which initiated different actions.
- Highlighting the issue of potential events: elaboration of a report explaining the events and causes of such events. Presentation of the report results in various places at national level (national/regional conferences).
- Proposal for specific organisations integrating a proactive approach in elaboration of RT procedures.

For the evaluation of RP practices in hospitals, different tools can be used:

- **In a hospital:** internal evaluation at the level of the relevant departments.  
This is usually the role of the QE.
  - Quantitative indicators include: Evolution of patient / staff exposures associated with specific procedures, follow-up of DRLs, follow-up of the number of RP events or unexpected exposures.
  - QE has a generic overview of the department's operational procedures and can identify gaps or weaknesses related to the development and implementation of an RP culture among the personnel.
- **External evaluation** by the Authorities during inspections:
  - Check compliance with regulations regarding the mandatory continuous RP training (number of person trained, content of training, ...)
  - Observation of the practices in the field.

## Lessons learned – Key issues in developing RP culture



- RP Culture is a key for the improvement in individual and group values, attitudes and expectation in relation to the management of radiation risk, and to consider consciously the RP aspects in all the relevant applications of medical technologies.
- A specific role to play for the professional associations of the different medical specialities, involved directly or indirectly in medical procedures giving rise to patient and/or staff exposures.
- A role also for Authorities acting to support the elaboration of training programmes or guidelines, as well as promoting RP through inspections.
- Initial training is a first step to raise awareness, but has to be completed by continuous education, integrating both theoretical and practical aspects.



