

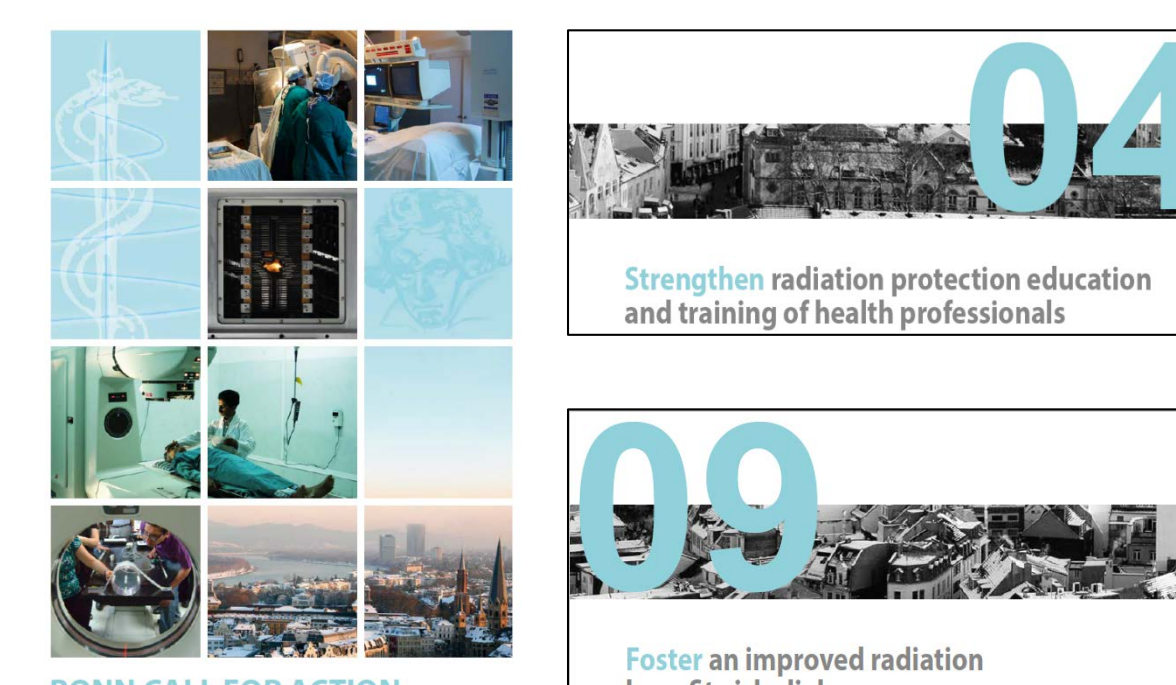
MEDICAL

Education and training related to medical exposure to ionising radiation – exploring (international) stakeholders' views and approaches

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Education & Training



Case study introduction and data

Topic and objectives: Education and training are important elements to build competence and raise awareness. Aim of this case study is 1) to identify the role of stakeholder engagement in the process of developing education and training related to medical radiation protection; 2) to identify the role of radiation risk communication and stakeholder engagement aspects within education and training courses.

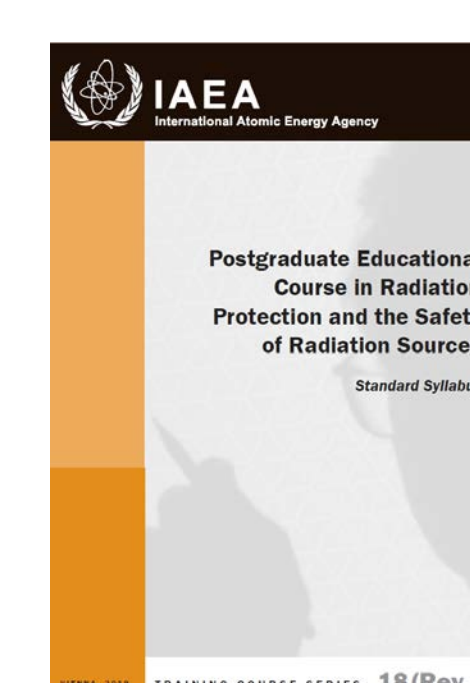
Methodology: Interviews with representatives of international organisations (HERCA, EUTERP, CONCERT); screening of relevant peer reviewed and grey literature; analysis of IAEA approaches on education and training; for Germany, internet search related to communication as part of technical radiation protection qualifications for doctors (“Fachkunde Strahlenschutz”), role of information / communication on websites of medical expert associations; analysis of training materials.

Findings

- Patient involvement and participatory decision making are side issues in literature but they do not play a role in education courses.
- Risk communication related to medical exposure to ionizing radiation is not an important issue:
 - Focus in trainings for medical specialists is limited to patient information / education.
 - No part in courses for radiation protection (technical qualifications).
 - Related topics in German Medical Journal limited to doctor-patient communication, participatory decision making or informed consent.
 - Focus of medical education at universities is limited to doctor-patient conversation.
- The radiation protection community does not deal with requirements of good risk communication and questions of participatory decision making in the medical field. However, social scientists deal with such issues (e. g. Harding Center for Risk Competence).
- There is a gap between radiation protection activities on the academic level and requirements from the vocational level. This gap prevents advancement in stakeholder engagement activities and the recognition of the importance of communication skills in the medical radiation protection field.

Conclusions

- Risk communication and participatory decision making elements have to be included into medical education, technical radiation protection courses, trainings for specialists and assistants.
- The radiation protection community should encourage good risk communication approaches.
- Guidance for radiation risk communication should be provided for – or be co-developed with – medical expert associations.
- The SSH platform SHARE should seek to approach important medical actors to develop a joint strategy.
- The gap between the academic level and the vocational level of radiation protection should be bridged by common efforts from all sides.



MEDICAL

Justification, optimisation, education and training at the Institute of Oncology

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Case study introduction and data

TOPIC: As a principal national institution, the Institute of Oncology Ljubljana (OI) supervises programs on the comprehensive management of cancer diseases in terms of prevention, early detection, diagnostics, treatment and rehabilitation, research and education. In their daily work they extensively use radioactive substances and ionizing radiation. This case study investigates the practical approaches used at the Oncology Institute in relation to:

- Justification and optimisation of Ionizing Radiation (IR) use by practitioners for individual medical exposures,
- Information on the risk of ionising radiation to patients and other individuals involved (technical staff, nurses, carers and comforters),
- Education and training for staff and for patients (and others) involved in the use or applications of IR.

OBJECTIVES: To identify the practices of stakeholder engagement related to the use and application of IR at the Oncology Institute in order to identify any differences between requirements and practice, and point out recommendations and/or lessons learned.

METHODOLOGY: Analyses of available information on webpage and via other channels is performed, a series of interviews (with a radiation protection officer, doctors, other staff and patients associations) were conducted to obtain information about justification and optimisation during different IR applications in practice, about what information is given to the patients and others (staff, carers and comforters), whether there any procedures in place, how the staff at OI are trained and what education related to use of IR consists of.

Findings

- Transposition of all BSS requirements in Slovenian legislation was done in the law and subordinate rule with provisions regarding engagement of patients and others involved in radiological procedures.
- At the webpage of OI, information is devoted to the public and patients with facts about cancer, the approaches to diagnosis & treatment with IR, protection measures, advices for patients and links to other websites.
- Communication with patients is perceived by medical staff as beneficial, since effective two-way discussion can improve the medical treatment, reduce the concern of the patients and reduce the doses for patients.
- The patients' associations distribute booklets and other material, but they are oriented to the support of patient and do not really have knowledge on IR.
- There is no information on the webpage about justification and optimisation of IR use by practitioners for individual medical exposures.
- Education and training for staff and for patients (and others) involved in the use or applications of IR – organised trainings for staff, also patients' associations and volunteers are available, and continuously performed.
- The practitioners are presenting the IR use to the patients, but the extent of their explanation is limited as they do not want to frighten people, or they do not have time to devote attention to more demanding patients.

Conclusions

- There should be more visibility about legal prescriptions related to information for public and patients in use of IR.
- Publications for patients on IR are relatively old and not comprehensive, therefore new publications should be developed with more attention to IR, and its the related risks and benefits.
- A radiation protection unit is established at the IO and provides support to all involved and also provides education and training for non-professionals: a description should be added on the website of IO – what is the role, how it is done, who is involved.
- To improve visibility, one website section would need to be prepared with focus to IR: what is required, how it is done, further information, links to more information.
- E&T for practitioners and other staff should be organized on how to communicate medical exposure with patients and others.
- A system should be established in which the collection of the needs or requirements related to IR would be recorded, which could lead to guided improvements.



MEDICAL

Stakeholder engagement – Experiences from nurse-practitioners - Belgium

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Case study introduction and data

- Context: Legally obligatory course on radiation protection – Staff in medical sector
 - Module – “Communication on radiation protection”
- Method: Class-discussion on radiation protection practices – communication & participation (patients and staff)
 - 5 topics of discussion



- Awareness on external prescriptions of stakeholder participation
- Understanding and practices of stakeholder engagement
- Rationales for stakeholder engagement
- Attitudes towards stakeholder participation
- Expressions of stakeholder participation



Findings

Awareness

- Limited awareness on participation and prescriptions
- One way communication - Informed consent

Understanding & practices

- Confusion between participation & communication
- “We send them to the doctor as they always want to be right anyway”

Rationales

- Participation is low-priority (highly instrumental)
- Right reserved for patients (normative)

Attitudes

- Short timeframe; i.e. in frame of procedure
- For the purpose of day-to-day activities

Expressions

- Informed consent
- Communication activities

Conclusions

- Stakeholder engagement is (almost) non-existent
- Very little awareness exists among nurse-practitioners on prescriptions for stakeholder participation – such as Informed Consent
- Confusion about who is responsible for Informed Consent; nurse-practitioners or doctor
- Confusion between participation and communication; they are used interchangeably
- “Real” participation wherein nurse-practitioners and patients have full co-decision-making power is considered impossible
- Only patients can participate, nurse-practitioners have no opportunities for participation
- Stakeholder participation is only considered on a short time frame



MEDICAL Stakeholders' role in the performance of medical exposures of pregnant women

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Case study introduction and data

The effective engagement of stakeholders involved directly or indirectly in medical exposures of pregnant women is crucial for the proper implementation of the justification and optimization principles. The group of stakeholders includes: referral physicians, gynecologists, radiologists, technologists, medical physicists, professional associations, patients, regulatory authorities, etc. For investigating their role and engagement the following methodology was used: a) collection of information found in literature b) use of data collected by the EEAE, c) interviews, d) analysis of data, and e) conclusions and lessons learned.

Findings

- Main motivators for effective stakeholders' engagement are: a) the need to comply with legislative requirements and b) the commitment to safety.
- Main benefits of the effective stakeholders' engagement are: a) the prevention of unjustified exposures, b) the optimization of the doses received by unborn children, and c) the prevention of inadvertent exposures.
- Main challenges related to stakeholders' engagement are the lack of awareness about the risks associated to the exposure of unborn children to ionizing radiation and the lack of a safety culture.



Conclusion

- The provision of education & training to stakeholders is necessary in order to ensure their effective engagement in procedures related to the medical exposures of pregnant women. In this respect, universities, scientific and professional societies as well as regulatory authorities have an important role to play.

MEDICAL

Role of stakeholders in medical interventional procedures with attention to radiological protection

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Case study introduction and data

TOPIC: This study relates to interventional image-guided procedures, that include ablation, embolization, biopsy and other procedures. Radiological Protection is of great importance for the quality of these procedures, and there are cases with possible links between the dose to the staff and dose to the patients. It is important to protect staff without impairing the clinical outcome of the procedure and without increasing patient exposure. Justification, optimization, dose limits (for workers and members of the staff), education and training, and attention to the development of new techniques are points of particular interest in the interventional procedures.

OBJECTIVES: To study the significance of stakeholder involvement in image guided interventions -which are particularly complex procedures-, and to analyse which stakeholders are involved and at what level..

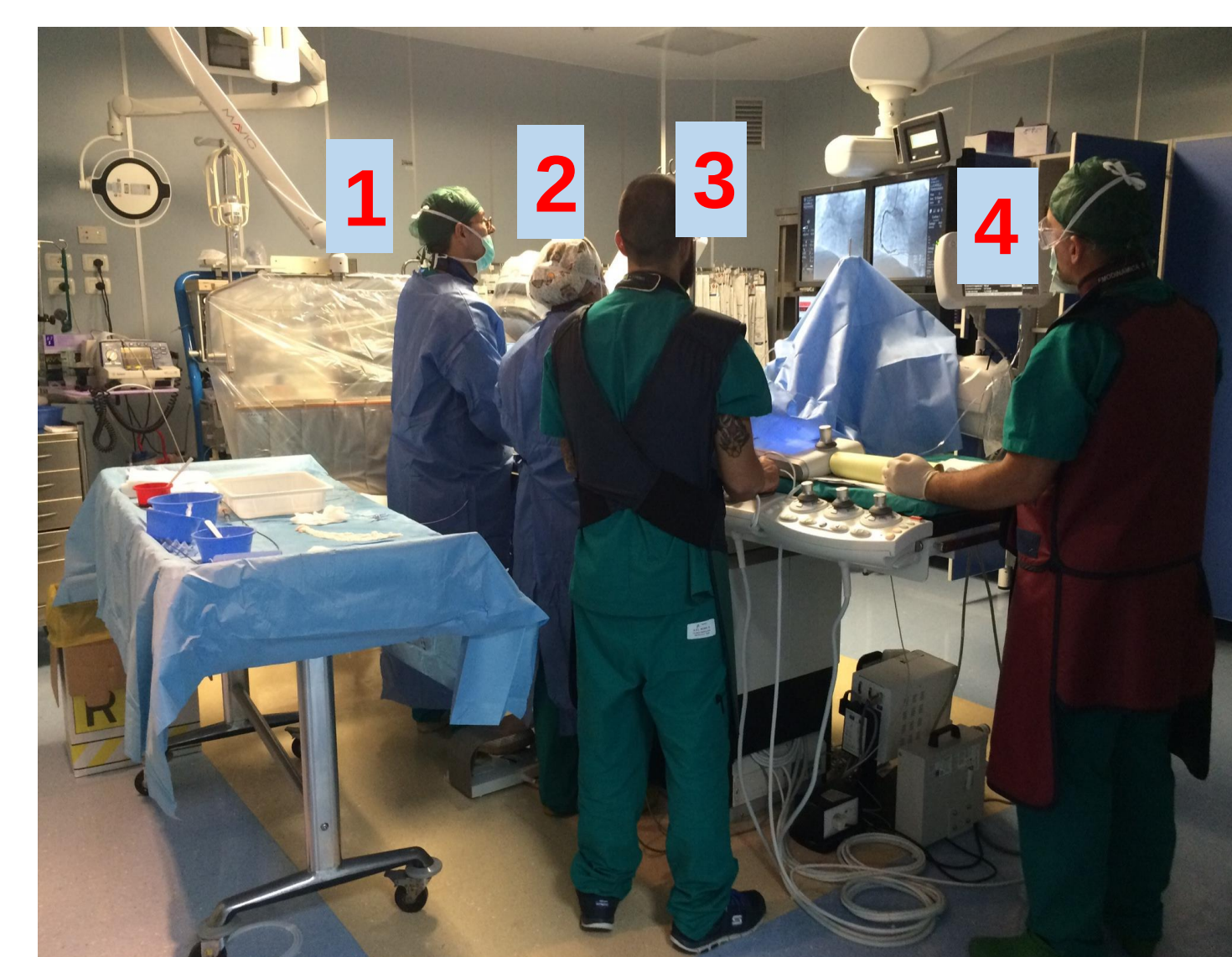
METHODOLOGY: The analysis is based on relevant documents at national level and interviews conducted with professionals with longstanding expertise in relation to interventional procedures and radiological protection. The considered professionals are involved in the Society of Medical Radiology, and in the Association of Medical Physics and the Education and Training in this field.

Findings

- In relation to stakeholder involvement, attention is mainly directed towards involvement of some professional figures, professional associations and manufacturers.
- There is a recognized lack of collaboration between the professional figures involved in the use of ionizing radiation.
- In general there is no attention dedicated to patient's involvement in the decision process. The patient is seen as the care receiver and attention is devoted to the technical aspects of the radiological protection in view of the specific interventional procedure.
- The state of the art in patient and staff protection in interventional procedures is in continuous evolution and changes have to be introduced, e.g. the attention to the eye-lens dose.
- Postgraduate Schools in Diagnostic Radiology provide training in the field of radiological protection; this is not the case for other schools whose specialists are involved in complementary interventional activities. The specific vocational training phase is indicated as an opportunity to improve the involvement of professionals, by exchanging experiences and points of view in the IR practice.

Conclusions

- The involvement of the various interested parties should be recognised at the level of the healthcare company manager. At the moment, it emerged that the involvement of interested parties still needs to go through an obligation.
- Vocational training provides an opportunity to start a truly collaborative approach among professional figures involved in interventional activities.
- Informed consent should be defined for the specific interventional procedures, including information on potential skin tissue reactions and with related recommendations.
- Risk communication is recognised in documents dedicated to interventional procedures as a fundamental support for the quality of health care structures; the link between these structures and patient associations is indicated.



Cortesy A. Sarandrea, ANPEQ, 2018

- 1) and 2) interventional radiologists,
- 3) radiology technologist,
- 4) nurse

In interventional radiology and cardiology staff members work as a team. The staff ranges from two to more persons working at different positions around the patient table, and the dose of the staff members is affected by the position.

Different professional associations and patient associations have given their contribution, together with industry, to continuously improve the safety and the quality of the procedures.

An Italian WG dedicated to interventional radiology, coordinated by ISS and INAIL, involved 11 Scientific, Professional Associations in the preparation national recommendations regarding optimization of radiological protection of patients and operators.



Attention is given to both informing and listening to interested parties, taking into account also the management of communication aspects



MEDICAL

Justification, optimization of ionising radiation use and stakeholder engagement in pediatric CT-scan (Spain)

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Case study introduction

This study aimed at investigating: 1) how the EURATOM/2013 Directive is implemented into practice and 2) how stakeholders (professionals and general public or patients) are involved and participate in issues of justification and optimisation of CT-scan uses, especially in case of children (vulnerable population).

Findings (from interviews)

- Awareness for implementation of the new Directive EURATOM/2013 exists among professionals of state hospitals; and some steps for its implementation have been taken in Spain.
- The idea of creating a kind of unified “passport” of patients (collecting information on doses they received from different medical centers, but not including here for the moment dentists) to be visible to any professional for better decision-making processes. However, resources are limited – missing or lack of funding & support from the local government.
- Patients are informed about risks from radiation exposure in medical procedures mainly by the leading doctor. However, some patients expressed distrust or wished to reconfirm the information provided with the hospital professionals on radiation protection. In some exceptional cases parents also did not believe the results of diagnostics and repeated on the same day the CT scan to their children in another center (double exposure).
- Practitioners need to have more supervision to avoid possible errors (examples: performing CT or X-ray to left leg instead of right). Also it is important that all such possible errors are reported to have information on all real exposures to the patient.
- General lack of time and resources (personnel in a hospital) leads to less attention (or less time devoted) to patients in reality.
- Interviewed professional stakeholders argue that improvement of basic knowledge among the general public on ionising radiation and the possible risks and benefits in the medical field, would be a plus. This can be achieved for instance by special cartoons with easy demonstration or explications to be displayed for children and adolescents in waiting halls or the distribution of leaflets with infographics.
- The patients and professional associations could help by posting professional information in their web pages or blogs, and making these open access and easy to be found on the Internet.



Figure 1. Creating an appropriate environment for kids for CT-scan procedures

Conclusions

Stakeholder engagement via *effective relationships between professionals and patients* could provide more *efficiency* in issues of *optimization and justification of the use ionising radiation use in medicine* and also make patients (as well as parents and caregivers) feel *more security* and *satisfaction via patient-centred approach*, giving them an opportunity to participate more actively in the decision-making processes with reference to their treatment and diagnostic procedures choices.

MEDICAL

Justification and optimization of ionising radiation use and stakeholder engagement in dental clinics in Spain

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Case study introduction

Dental clinics in Spain are private. Dentists use X-rays in their practice for diagnostics and treatment of patients, as well as for esthetic works related to the patient's or client's teeth. Stakeholder engagement (of both professionals, and patients or clients of clinics) in radiation protection issues is important in terms of justification and optimisation of the use of ionising radiation (IR) in dental practice.

The objective of this study was to observe how regulatory prescriptions (as per EURATOM Directive/2013) on information, optimization and justification of the use of IR in the medical field is implemented in practice. The ways of possible stakeholder engagement were analysed as well.

Findings

- The analysis of peer-reviewed publications showed that while informed consent in dental clinics is considered important, it has not been given the same consideration as in other medical practices
- No concern about the new European Directive (also adapted to a local Spanish law) with regards to providing information on doses obtained to patients/clients
- Deficient knowledge on IR and confusion regarding radiation protection by professionals of dental clinics (on some professional private web-pages and in clinical practices) leads to insufficient, poor or misleading information to be provided to clients or patients:

On the question on doses applied in the “panoramic picture” (with use of X-rays), the dentist replied:

– *We have three different levels...that can be changed... Here, you can see the numbers on the screen, but I do not know what they do mean.*

On the question regarding doses involved in taking pictures of one or a couple of teeth (to obtain more details on cavities of the patient), the dentist replied:

– *Here the doses are small.*

– *How small are they?*

– *I do not know, but one professional told us that they are nothing, similar to what we receive from microwave.*

Conclusions

- There is no stakeholder participation with regards to justification and optimisation of doses applied in a dental private clinic.
- Both professional stakeholders (dentists) and patients need to obtain more information to increase their awareness on IR use in dental practice, about risks and benefits and the most efficient way of mutual collaboration on IR use, justification and optimisation.
- Professionals of dental clinics have to receive additional education to update their knowledge on IR, RP and new changes in law and its application in practice.



Figure 1. Adapted by Liutsko, L. from: <https://www.imagegently.org/>

MEDICAL

Justification, optimization and stakeholder engagement in relation to the use of chest X-rays for obtaining a driving license (post-Soviet countries)

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Case study introduction

This study illustrates the bottom-up self-organization of stakeholders (general public, applicants for a driving license) in relation to the existing requirement for a chest X-ray (fluorography) in order to obtain a valid medical certificate for the driving license (new or to be renewed) in post-Soviet countries (Belarus, Russia and Ukraine).

Findings

- Though post-Soviet countries Belarus, Russia and Ukraine are non-EU countries, and the EU Directive is not applicable for these areas, the principles of optimization and justification of the use of IR in the medical field are also applied (or intended to be applied) in practice. The local laws are based on the application of ICRP publication 105 .
- WHO recommendation on using chest X-ray (fluorography) only in populations with a high risk for tuberculosis was already successfully applied in practices in a majority of European countries. However, in some countries the fluorography is still obligatory on a periodical basis.
- In order to obtain the medical certificate needed for the driving license in post-Soviet countries (Russia, Belarus and Ukraine, for example) it is necessary to obtain the approval of a general physician concerning the “healthy status” of the applicant; this involves also the requirement of having passed the chest X-ray among other procedures.
- The question whether “it is possible to obtain the medical certificate without having been exposed to X-rays?” based on the established procedure many years ago (in the Soviet epoch) is widely discussed among the general public in the self-organized Internet Forums (Figure 1 displays some examples). Sometimes professional stakeholders – medical workers and lawyers (or legislators) are also involved as particular users of these Internet Forums.

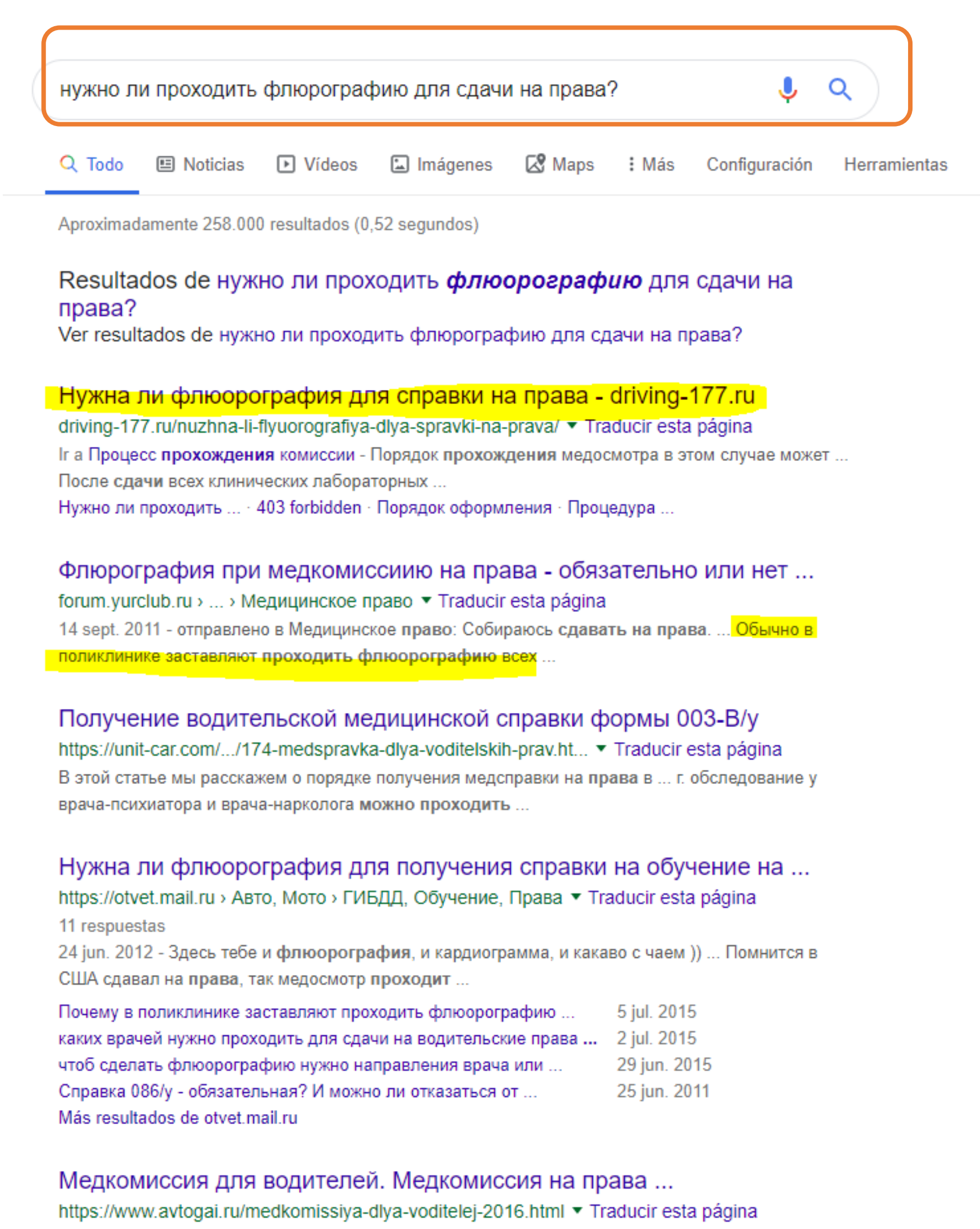


Figure 1. Internet Forum discussions

Conclusions

This example shows a raising awareness of people (general public) on questions related to the optimisation and justification of the use of IR (fluorography as a preventive measure against tuberculosis for obtaining a diving licence) and the public discussion around these questions via open Internet Forums. Thus, we have at least, two positive outcomes:

- Raising awareness and knowledge on IR and protection against IR in the general public;
- Stakeholders self-organise in order to openly discuss questions related to justification & optimization of exposures to IR.

Recommendations

In order for this bottom-up stakeholder engagement to result in any significant change, medical professionals and other stakeholders who are involved in the decision-making processes and legislation should be involved to promote it further. These actors should re-evaluate the risks and benefits from the periodical exposure to chest X-rays, and apply this procedure only for the populations at high-risk for tuberculosis, as recommended by WHO.

MEDICAL

Informed consent in medical use of radiation for cancer treatment in Romania



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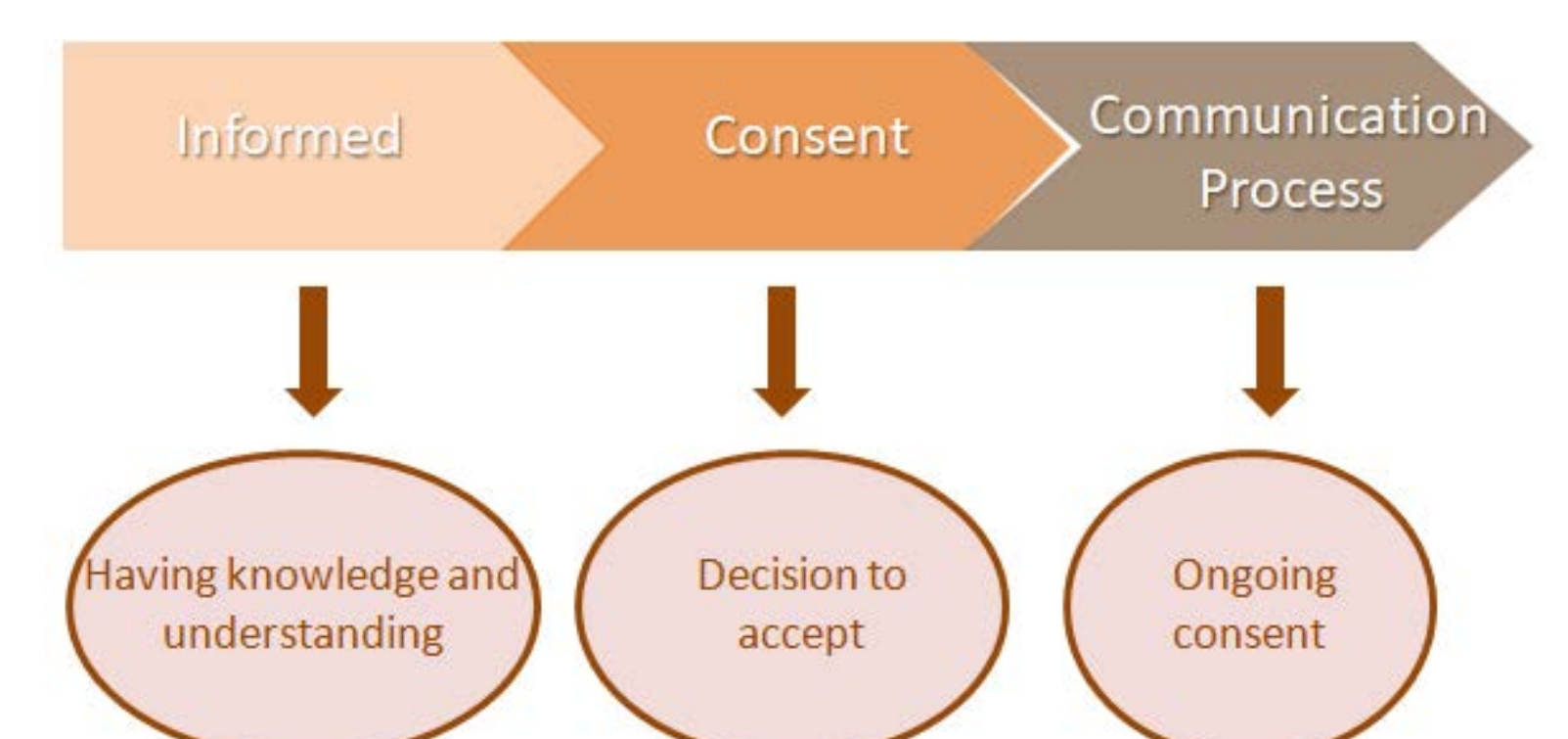
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Case study introduction and data

Aim: The case study focused on patients' perception of information provided in the framework of informed radiation consent. According to the BSS, the medical practitioners have the clinical responsibility to communicate about the risks of radiation-induced effects of diagnostic and therapeutic procedures to the patients and other involved individuals, and obtain consent for exposing them to radiation. Informed (radiation) consent as an important ethical and practical part of engaging with patients, is not simply an act of signing a formal document but a communication process between the patients and a health care provider. The interpersonal component, the patients' involvement in a communication process with medical practitioners together with the technical aspects of care defines the quality in radiotherapy. In this preliminary study 11 medical practitioners and 50 cancer patients undergoing radiotherapy filled in questionnaires (with closed and open questions) concerning the different aspects of informed consent.

Preliminary findings

- Consent is requested two days before the procedure;
- Medical practitioners consider that the process of communication between the medical staff and patients could be improved;
- Patients highlight that information about the risks and benefits of the procedure, as well as possible alternatives and general information about the procedure are all important; 10% think that technical details about the procedure are less important;
- Most patients consider that, in general, the information received satisfied their needs; however only 1 in 4 patients considered that the information received was easy to understand;
- One in two patients consider that information should be given some days before therapy, while the others think that the information should be given immediately before the procedure;
- Among patients, 40% of the respondents recommend that information should be given both orally and in writing, while others suggest either oral or written information;
- None of the patients provided additional suggestions for improvement of the dialogue with the patients.



Conclusions

- Communication between the patients and medical staff may be improved by providing clearer information, both orally and written, sufficiently in advance before the procedure, including general information, information about risks benefits and potential alternatives.



MEDICAL

How to initiate radiation protection culture for student nurses ?

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Case study introduction and data

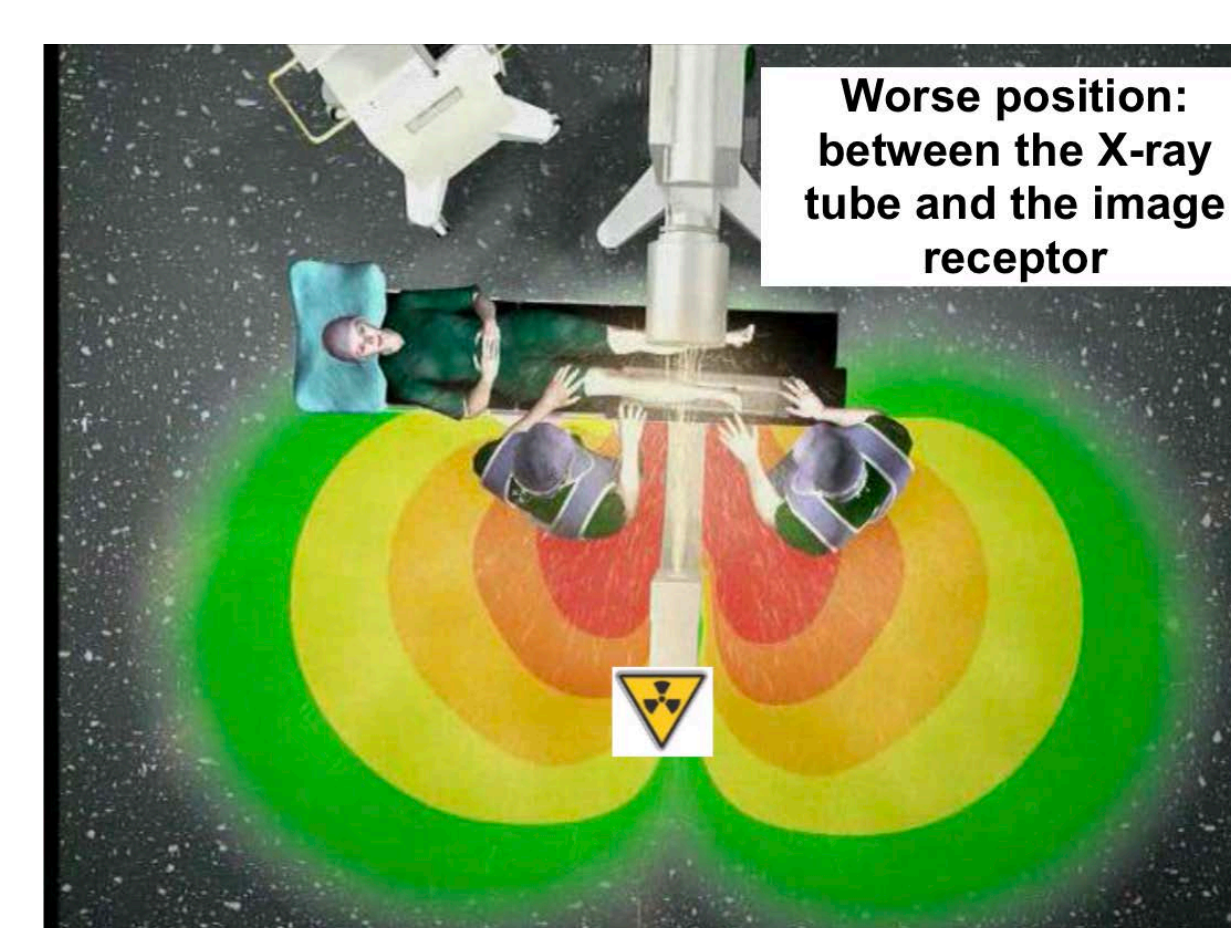
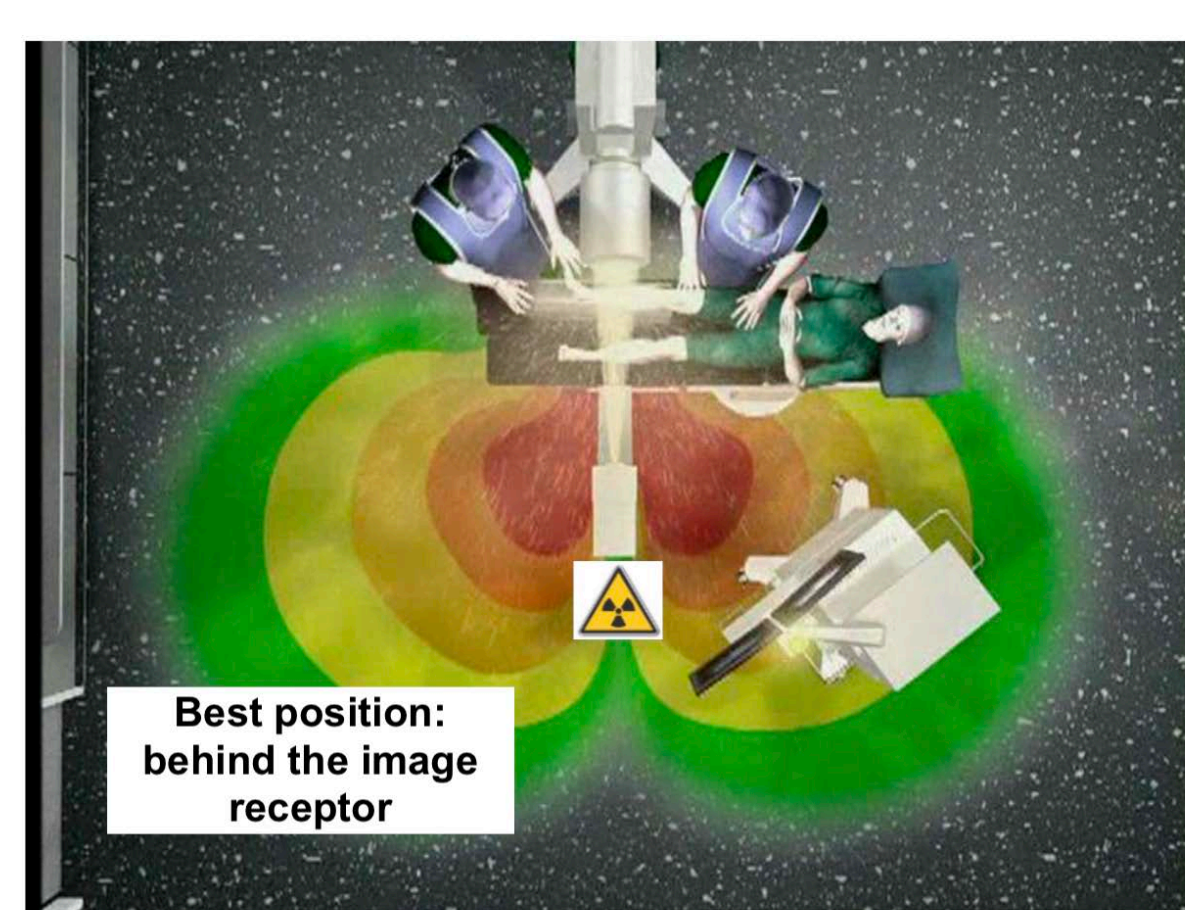
- **Initiators:** the Montbéliard Urban Public Authority (PMA), the French Institute for Radiological Protection and Nuclear Safety (IRSN) and the University of Franche-Comté (UFC)
- **Target stakeholders:** Student nurses in their 3rd year of school, and, indirectly, school pedagogic staff
- **Aims:**
 - Raise awareness on RP exposure situations they may encounter in their workspace
 - Improve engagement process for self-protective actions, advices and explanations to patients
 - Give keys to apply protocols and to disseminate RP culture to colleagues
- **Training Course:**
 - Given by the RP expert of the hospital (HNFC).
 - Upstream individual work by students: Introduction of RP questions in a tutorial dedicated to digestive cancer to identify their level of RP knowledge
 - 2 hours training course including a feedback discussion on the results of the tutorial



Findings

- Deficit of initial training for nurses in radiological protection
- Main topics to be addressed in the training course:
 - Knowledge on radiation and associated health effects
 - Overview of the use of ionizing radiation in the medical field
 - Associated exposure levels (patients and workers)
 - Means of protection with concrete examples
- Limited course duration: importance to give access to additional resources (Internet links, examples of protocols used in hospital, nurse professional associations, RP societies,)

Example of
good RP
practice: how to
be positioned in
operating room



Conclusions

- The assessment made after the training course showed that the needs and concerns of students were addressed
- Such a training Course is only a first step in the building of RP culture among these professionals
- Practical experience has to be developed based on the day-to-day activities in the hospital
- The RP Expert of the hospital has a key role to play to foster the dissemination of RP culture in the field
- This local RP experience should be expanded at a regional or national level:
 - Need to integrate first elements of RP culture within the national pedagogic programme of nurses, with the development of a national training scheme on this topic
 - Need for the support from other actors: national RP authority, health ministry, nurse professional associations,...
 - Need for the development of complementary training materials to be made available as continuous education to improve the day-to-day practices and provide a regular update of skills and knowledge on RP culture.

MEDICAL

Building and enhancement of a radiation protection culture among medical specialties participating to fluoroscopically guided medical procedures

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Case study introduction and data

Fluoroscopically guided interventional procedures may lead to high exposures of the patients and the participating personnel. Therefore, physicians involved in these procedures should have appropriate education & training on radiation protection (RP) as well as the necessary RP culture.

Physicians are trained on theoretical aspects of RP during the first years of undergraduate studies in the medical schools. They are also given elements of RP culture during the undergraduate studies or/and postgraduate training for getting their specialization.

EEAE in cooperation with professional societies organizes training courses for physicians participating in fluoroscopically guided procedures covering both theoretical and practical aspects of RP and emphasizing the development of an RP culture.

Findings

- The provision of additional training on RP to physicians participating to fluoroscopically guided procedures resulted in:
 - o A more realistic perception of the risk associated with medical exposures;
 - o The use of risk as an additional criterion in decision making;
 - o Their familiarization with optimization tools;
 - o An improved communication with QEs in hospitals.
- The feedback provided by the participants is used for the optimisation of the course design and organisation.



Conclusions

- The provision of education, training and re-training on RP to physicians participating in fluoroscopically guided procedures is crucial for building and enhancing an RP culture.
- Training and retraining needs of the physicians participating in fluoroscopically guided procedures should be evaluated regularly.
- The training on RP has a positive effect on the communication between physicians and the Qualified Experts. The communication channels created improved the level of cooperation for addressing practical issues related to medical or occupational exposures, therefore resulting in many cases in the reduction of the respective doses.

MEDICAL

Actions undertaken to mitigate the risk of accidental exposures in radiotherapy

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Case study introduction and data

TOPIC: This study compares the proactive approach and its use towards the management of risk from accidental exposure in Radiation Therapy (RT), with the prescriptive approach. The study argues in favour of introducing and promoting a proactive approach in the most advanced forms of planning and dose deliveries in RT. To be proactive instead of just reactive, as part of an adequate radiological protection culture (RPC), requires not only to react properly if something happens, but also to start developing a structured approach to identify and analyse adverse events, occurrence rating and potential severity, in the different steps of the RT process.

OBJECTIVES: To highlight the role of RPC for an effective and active engagement of the professionals that are part of the staff involved in the RT application, thus contributing to supporting the reduction of accidental risks.

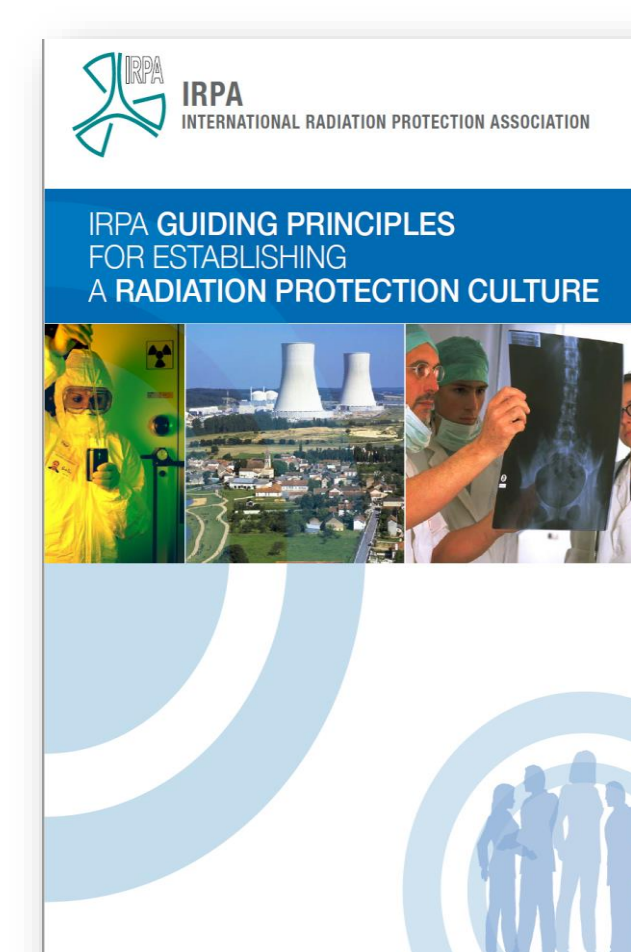
METHODOLOGY: This study is based on i) the experience at national level of a Task Group within the Italian Association of Medical Physics, dedicated to the aspects pertaining to a proactive approach with reference to risk in RT, and ii) on the events, congresses and national courses organised in connection with the professional in medical physics, radiation therapists and with the involvement of technical and scientific figures, with attention to different RT approaches (IMRT, SBRT, Brachithrapy, Protontherapy, IORT).

Findings

- RPC has intrinsic value in judgments about the performing steps of a procedure, and is of help in identifying optimal behaviours, for different involved professionals and in the relevant cases.
- RPC enables an effective and active engagement of professionals involved in RT applications.
- The proactive approach is related to RPC in the evaluation of potential failures and of their effects in RT, and towards reduction of accidental risk.
- RPC can also help to consider the distribution of resources in the specific medical areas, on the basis of radiological protection implications and experiences.
- Development of RPC in RT, through FMEA, results in advantages for:
 - patients and their families,
 - professionals involved and others
 - managers of the departments
 - responsible of the structure.

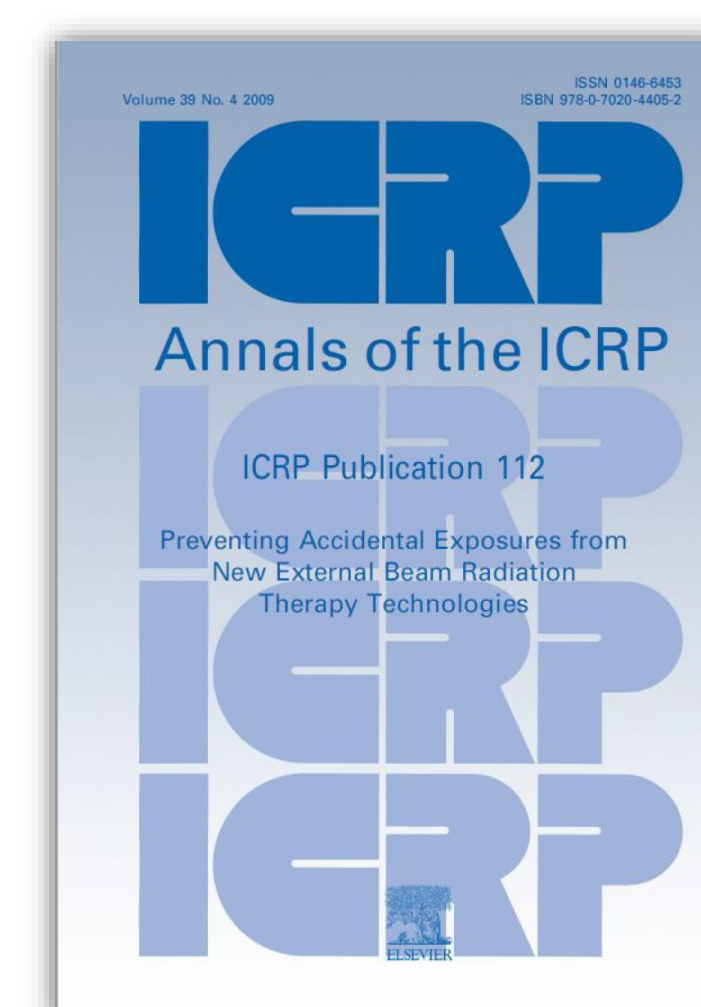
Conclusions

- The case study evidenced the values of and the need for RPC in consideration of putting in practice the proactive approach with an increased awareness on risk-benefits in RT
- Nobody can do all this work alone; RT is a matter of a multidisciplinary team. RPC supports the sharing of experiences and judgements, even in case of bad experiences (e.g. errors made).
- RPC can help to create or increase openness, mutual trust, participation in a transparent and inclusive environment, thus it is well recognised for supporting communication and cooperation in case of possible potential risks.



Education and training contribute to a high level of RP culture by addressing the above issues, and also by **continued proactive** updating for professionals and the general staff, on the evolution of **scientific knowledge and related judgments of relevance in RP**. “ (IRPA, 2014)

“Disseminating **lessons learned** for serious incidents is **necessary but not sufficient** when dealing with new technologies. It is of utmost **importance to be proactive** . . .” (ICRP 112, 2009)

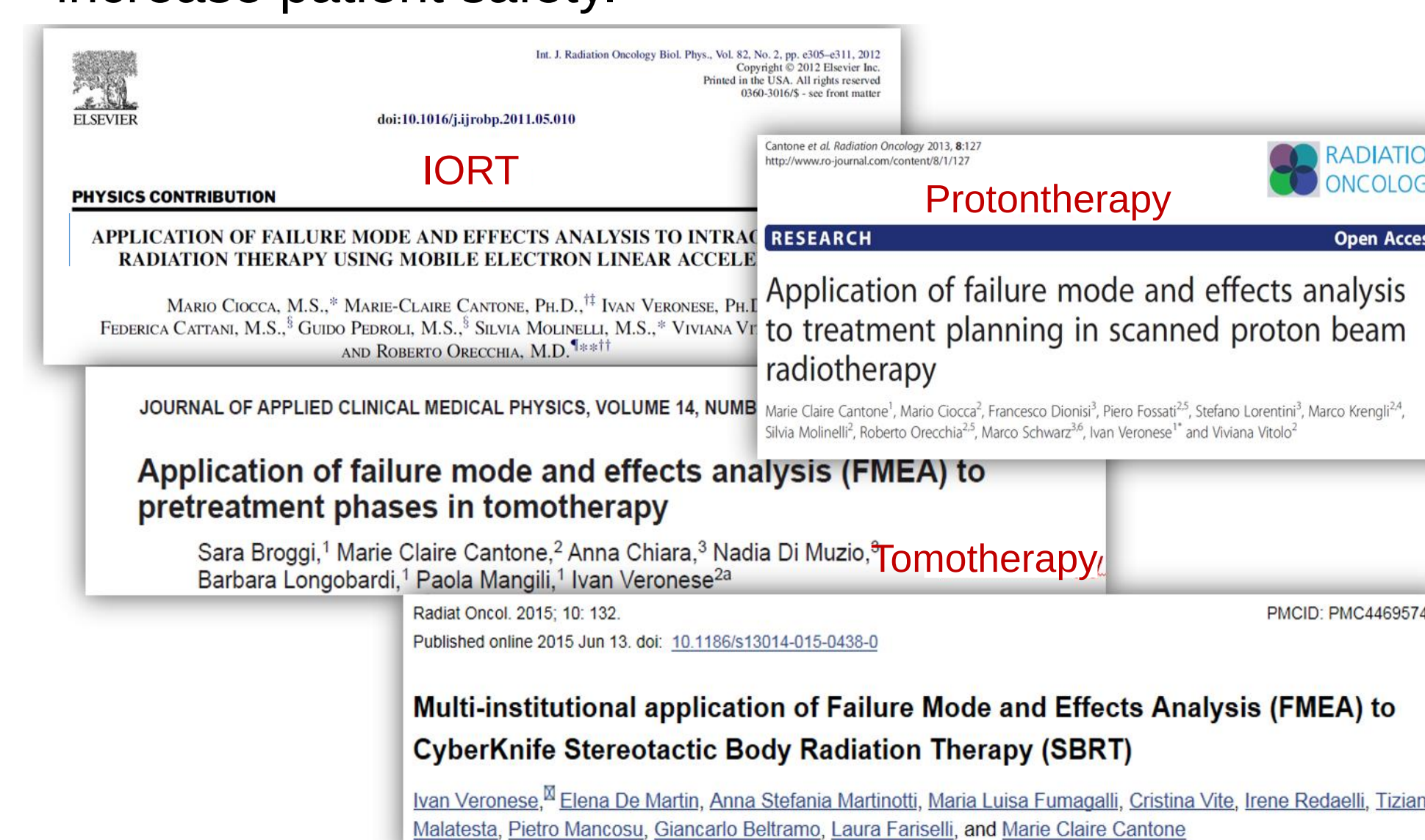


A number of events were organised to introduce and discuss the proactive approach and the relation with RPC.

An Italian **report analysing** the main issues, by presenting prospective approaches and discussing international cases of accident. AIFM, 2012



The analysed cases indicate that **the approach FMEA, provided the needed staff efforts, it is feasible and leads to new solutions to mitigate the risk of failures**, thus to increase patient safety.



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 RPC within an active and proactive inclusion and participation of the staff**. (M.C.Cantone IAEA CN-223, 2014)