IMPROVE AWARENESS, COLLABORATION AND OUTCOME BY CROSS-POLLINATION

Happy New Year and a very warm welcome to the third edition of Quality News (QN)! While many organizations have newsletter(s), their distribution usually does not reach other fields or regions. QN aims to serve as a common platform and to “cross-pollinate” across disciplines. The goal is to save resources, minimize duplication and maximize impact by promoting awareness and collaboration.

Contents are progressively being added to the ICRQS website http://www.isradiology.org/isr/quality.php, including QN. We thank the experts who have joined one of the 5 ICRQS Working Groups, focusing on: justification, optimization, incident reduction, occupational radiation protection and individual health assessment. They include radiologists and others from within and outside the International Society of Radiology. The combined experience and expertise of these multi-disciplinary teams support the Commission’s work.

Some recent conferences are outlined here, e.g. WHO International Consultation on Individual Health Assessment, IAEA International Conference on Occupational Radiation Protection, 4th African Regional IRPA Congress, 3rd Australasian Conference on Error in Medical Imaging, Uganda Society for Advancement of Radiology and Imaging ASM etc. With the WHO and IAEA, the ICRQS hosted a session during the 2014 International Congress of Radiology and updated radiologists of the new Basic Safety Standards and Bonn Call-for-Action developments. With the WHO, the ICRQS participated in an Asia-Pacific Symposium: “Evidence and Values in Medical Imaging”, as a pre-congress event of the Korean Congress of Radiology; and contributed to a Training Course on “Justification of Diagnostic Imaging and Use of Referral Guidelines” in collaboration with the Dubai Health Authority.

Examples of quality activities are described, from the: American College of Radiology, European Federation of Radiographer Societies, International Atomic Energy Agency, International Commission on Radiological Protection, International Organization for Medical Physics, International Society of Radiographers and Radiological Technologists, Pan American Health Organization, United Nations Scientific Committee on the Effects of Atomic Radiation and WHO Patients for Patient Safety Programme etc. There are three articles on system-wide quality initiatives: EuroSafe Imaging, Image Gently and the pending launch of AFROSAFE. These initiatives share common features, i.e. by involving more stakeholders and undertaking a comprehensive range of actions, they have wider impact but take more time to deliver.

One of the barriers limiting quality and safety improvements is inertia. While there are many excellent recommendations and guidance tools available, practitioners’ awareness is low. QN aims to promote awareness and provide the links (access) to these downloadable recommendations and guidance tools (refer to pages 17-18). Good teamwork and audit would improve their application in daily practice.

THANK YOU to our contributors - as a direct result of your support this edition of QN has doubled in size. For those willing to share experience with our readers, please submit an article and be part of this “cross-pollination” effort. Your feedback on QN is welcome and will guide its on-going improvement.

Wishing you success with your quality projects in the coming year.

Lawrence Lau
Editor, Quality News
Chair, International Commission on Radiological Quality and Safety
WHO International Consultation on Individual Health Assessment - Justification of the Use of CT in Asymptomatic People

On 15-17 October 2014, Bundesamt für Strahlenschutz (BfS) in Munich, a WHO Collaborating Centre, hosted a WHO International Consultation on “Justification of the Use of Computed Tomography (CT) for Individual Health Assessment (IHA) of Asymptomatic People”.

This consultation forms part of the activities conducted under the WHO Global Initiative on Radiation Safety in Health Care Settings. The Global Initiative aims to mobilize the wider health sector in the safe and effective use of radiation in medicine. It supports the implementation of the procedure justification requirements as detailed in the new international Basic Safety Standards (BSS), and Action #1 (justification) of Bonn Call for Action, wherein the promotion of appropriate use of CT for IHA is specifically mentioned.

The consultation’s objective was to identify the key factors to be considered for the development of a framework for justification of IHA of asymptomatic individuals. Key stakeholders from 25 countries provided input as to the current practice in their respective healthcare systems (Fig. 1).

It was noted that the use of CT for IHA has risen progressively, due to an increased availability of and access to CT. Examples of CT use in IHA include CT coronary angiography, cardiac CT for calcium scoring, CT colonography, chest CT for lung cancer screening. In some countries, crafty advertising and poorly informed consumers and providers contribute to unjustified CT use, e.g. whole-body CT.

Participating experts recognized the use of CT for IHA is justified in some conditions. Thus, when developing policies and recommendations about the use of CT for IHA, policy makers should be cognizant of evidence-based best practice for a particular condition and consider the procedure’s risks and benefits. It was acknowledged that controlling risks while maximizing benefits is a challenge.

Strategies applied by healthcare policy makers to improve justification of CT use in IHA in several countries were presented, including advocacy, awareness raising of radiation health effects and risks, education, regulation and promotion of the use of screening guidelines.

The role of the WHO was canvassed, and the stakeholders called for worldwide public health education campaigns to improve the use of diagnostic procedures. Consensus was achieved to initiate concerted efforts to improve awareness about procedure justification - in this case the use of CT in IHA, and to promote constructive dialogue between patients and healthcare providers, enabling both to make informed decisions.

It was noted the need for regular audits in imaging practices that would highlight unjustified imaging and identify knowledge and practice gaps.

The consultation helped identify the key factors to be considered in the process of justification of these practices. Moving forward, the outline of a future report providing a framework for justification of CT in IHA of asymptomatic individuals was discussed. Other proposed deliverables include the formation of a web-based network of countries to collaborate in actions to improve justification, and to consider a day of awareness.

Participants unanimously agreed that ensuring justification in imaging practices is imperative, and tangible steps should be taken to affect meaningful change in health practice around the world.

(Article courtesy of Mr. Brian Fernandes, Dr. Miriam Mikhail, and Dr. Maria Perez)
Although the radiation dose associated with radiographic studies in dentistry are low for the individual patient, oral imaging exams are one of the most frequently performed studies throughout the world. In the United States alone, during 2006, there were more than 500 million intraoral bitewing and full-mouth radiographs performed, almost twice the number of conventional radiographs and fluoroscopic exams combined. What is even more challenging is the wide range of exposure settings using in dental offices, with typical doses for a full-mouth series of 34-388 microSeiverts (typical effective dose).

With this in mind, the dental community under the leadership of Drs. Alan Lune and Allan Farman, approached the Alliance for Radiation Safety in Pediatric Imaging with the idea of expanding the Image Gently campaign into dentistry. Their activism combined with the Image Gently expertise in pediatric safety, resulted in the Image Gently in Dentistry campaign (Fig. 2) launched September 24, 2014 at the annual meeting of the American Academy of Oral and Maxillofacial Radiology.

Led by a multi-disciplinary committee of general dentists, pediatric dentists, dental radiologists, radiation biologists, pediatric radiologists, dental hygienists and medical imaging physicists, this robust collaboration resulted in numerous scientific articles, advertising and a strong educational presence on the Image Gently website in pediatric dentistry. http://www.imagegently.org

The campaign also reaches out to parents and includes a parent pamphlet that described different dental imaging techniques. A “frequently asked questions” section is also present on the website.

In addition to the collaboration among medical and dental professionals and parents, is the resounding support for the campaign within the dental community. Over 15 national and international dental organizations joined the Alliance, including the International Association of Dento-Maxillo-Facial Radiology. Organizations include representation from the dental hygienists and dental assistant community.

The Image Gently campaign is proud to include the dental campaign as part of its international outreach in pediatric radiation protection!

(Article courtesy of Marilyn Goske, MD, Co-Chair of the Image Gently Alliance)
The statutory role of the International Atomic Energy Agency (IAEA) is to establish or adopt standards of safety for protection of health and minimization of danger to life and to provide for the application of these standards. The current International Basic Safety Standards for the Radiation Protection and Safety of Radiation Sources (BSS) specifically address the radiation protection in respect to medical exposure by establishing requirements on responsibilities, training of healthcare specialists, justification, optimization and prevention of unintended and accidental medical exposure.

Avoiding unnecessary radiation exposure of patients, either due to lack of justification or optimization, without hampering medical purposes, is the goal of the IAEA’s work on the radiation protection of patients. Different approaches are used, in line with the International Action Plan for the radiological protection of patients, formulated in 2001. The actions for the next decade have been updated by the International Conference on Radiation Protection in Medicine - Setting the Scene for the Next Decade, organized by the IAEA and co-sponsored by the WHO in 2012, and formulated in the Bonn Call-for-Action.

IAEA provides guidelines for practical implementation of the BSS requirements. A number of IAEA Safety Reports were published in last few years addressing safety in existing and newly emerging technologies, like interventional procedures, cardiac CT, CT colonography, PET/CT, paediatric radiology, etc. Under development is a new “Safety Guide on Radiation Protection and Safety in Medical Uses of Ionizing Radiation”, which was distributed recently for official comments by IAEA Member States. This Safety Guide, prepared jointly by IAEA, WHO, PAHO and ILO, provides guidance for end-users in medical radiation facilities, including management, radiologists, radiation technologists, medical physicists and other health professionals, referring medical practitioners, manufacturers and suppliers of medical radiological equipment, and ethics committees with responsibilities for biomedical research. A training course on implementation of the new Safety Guide is planned for end of 2015.

Actions on justification of medical imaging and patient exposure tracking. Since 2007, the IAEA has been convening a series of consultancy and technical meetings to review practical and achievable actions that might lead to reducing the unnecessary medical exposure through more effective justification (Fig. 3). As a result of these meetings, the “3 As” approach was formulated: “Awareness”, through effective communication about risk; “Appropriateness”, through use of clinical referral guidelines for imaging developed by professional bodies, and “Audit”, through clinical audit of justification. Improved benefit / risk dialogue with patients and the public is crucial for the success. IAEA is promoting the adoption in Member States of mechanisms to achieve patient exposure tracking, in support to optimization and justification.

Two technical meetings of interest for radiologists are planned for 2015 – one on justification of medical exposure and the use of appropriateness criteria, and one on radiation exposure tracking of patients. Further development is planned of guidance material on justification targeted at referring medical practitioners, and other practical tools to support implementation.

Training activities for health professionals. The IAEA contributes to the improvement of skills and expertise of health professionals involved in medical exposure by providing free training materials on radiation protection in medicine through the RPOP website, and organizing training activities, in the framework of the Technical Cooperation Program. During the last decade, tens of training events have been organized and are being planned for radiologists, radiation technologists, medical physicists and other specialists using x-rays outside imaging departments, namely cardiologists, vascular surgeons, orthopedic surgeons, gastroenterologists etc.

Part 2 of this article continues in the July edition of Quality News. For more information, visit us at https://rpop.iaea.org.

(Article courtesy of Jenia Vassileva and Ola Holmberg, Radiation Protection of Patients Unit, Department of Nuclear Safety and Security, International Atomic Energy Agency)
ICRP Committee 3 - a Prime Body on Quality & Safety for Radiologists

Committee 3 of the International Commission on Radiological Protection (ICRP) deals with protection in medicine. Out of the 16 members, 8 are either radiologists or nuclear medicine physicians (Fig. 4).

There is no publication from the Committees of ICRP which does not deal with radiological quality and safety. In fact, ICRP is the body that provided: 1) the principles of radiation protection in terms of justification and optimization and 2) recommended approaches to optimization in practice, e.g. by keeping exposure as low as reasonably achievable (ALARA) necessary to achieve the required medical objective (diagnostic or therapeutic) and by using diagnostic reference levels (DRLs).

Every aspect of radiation protection of patients and staff is covered by ICRP through its publications and as part of the quality assurance programmes. During the last 13 years 17 publications have emerged covering protection aspects in imaging and radiotherapy for both patients and staff (http://www.icrp.org/publications.asp).

The topics included: protection in pregnancy, CT, digital imaging, interventional procedures, cardiology, pediatrics, use of fluoroscopy outside imaging departments, brachytherapy, accident prevention, education and training, doses from radiopharmaceuticals and guide for medical practitioners. Upcoming publications in 2015 include protection in ion beam therapy and in cone beam CT (CBCT).

Material in medical publications are directed at doctors such as radiologists rather than being highly technical publications for medical physicists. Posters and stickers for paediatric radiology developed in cooperation with ISR are available for free download from ICRP website (http://www.icrp.org/page.asp?id=13).

Most publications on Committee 3 are associated with educational material in the form of power point slides that are available for free download at http://www.icrp.org/page.asp?id=35.

A draft of every ICRP publication is made available in the ICRP website for public consultation for a period of 90 days. Comments from professional societies, organizations and individuals are taken into account before a document is published as Annals of ICRP. This process provides good opportunity for everyone to participate.

(Article courtesy of Professor Eliseo Vano Committee 3 Chair and Professor Madan Rehani Committee 3 Secretary)

4th African Regional IRPA Congress

The 4th African Regional IRPA Congress (AFRIRPA04) of the International Radiation Protection Association (IRPA) took place from 13th to 17th September 2014, in Rabat Morocco, at the Faculty of Medicine and Pharmacy. It was attended by participants from various African countries and other regions of the world.

The speakers came from Morocco, Tunisia, Egypt, Sudan, Madagascar, Kenya, Uganda, Cameroon, Senegal, Nigeria, Ghana, Mauritania, South Africa, USA, UK, Belgium, Germany, France, Australia and Spain. Various international and regional organizations were represented including WHO, UNSCEAR, IRPA and FAMPO.

The congress included refresher courses, plenary lectures, thematic sessions, scientific workshops, a “young scientist award” session and poster exhibition. There were topics under the main radiation protection principles of justification and optimization.

The opening lecture was delivered by the IRPA President, Dr. Renate Czarwinski. Some of the lectures delivered included:

- Radiation protection in medicine - challenges and opportunities - María del Rosario Perez, WHO
- New trends and challenge in pedagogy for the future of education and training in radiation protection - A. Hammod, France
- Justification of medical imaging and use of referral guidelines in Africa, María del Rosario Perez, WHO and Michael Kwooya, Uganda
- Radiological environmental and public exposure considerations for existing and future nuclear power plants - J. Harris, USA
- Radiation protection in clinical practice: Challenges for the medical physicist - F. Nüsslin, IOMP
- Establishment of national radiation safety infrastructure in accordance with the IAEA safety standards - Ibrahim Shadad, IAEA
- Leadership and innovations to improve quality imaging and radiation safety in Africa - Aza Hammou, Tunisia

The talks on justification, referral guidelines and the WHO - IRQN referral guidelines project report attracted much attention from the audience. There was a desire for more information on referral guidelines and to make the referring medical practitioners more aware of 1) the role of guidelines in ensuring radiation safety and 2) guideline use in daily practice according to the new BSS.

(Article courtesy of Professor Michael Kwooya, Secretary General, African Society of Radiology)
QUALITY NEWS

Pending launch of AFROSAFE

The Pan African Congress of Radiology and Imaging (PACORI) will be held from 17th to 20th February 2015 in Nairobi, Kenya. Individuals and organizations in Africa plan to launch AFROSAFE on 17th, during the pre-congress workshop on radiation protection.

AFROSAFE will be an NGO representing organizations and individuals in Africa, who are united with a common goal to promote quality, safe and appropriate use of diagnostic, screening and therapeutic medical procedures employing ionizing radiation and to prevent radiation-induced injuries from such procedures.

The organization will advocate adherence to policies, strategies and activities to improve radiation safety and to maximize the benefits from radiological medical procedures, with a special focus on children and women in the reproductive age group. The vision for AFROSAFE is “All throughout Africa, medical procedures utilizing ionizing radiation are of highest achievable quality, safe and beneficial”. The mission is “To ensure that throughout Africa, the benefits outweigh the harms for all individuals exposed to radiation for screening, diagnosis or therapy at all levels of care.”

In the last few decades, the use of radiation for diagnosis and treatment has expanded rapidly worldwide, including Africa. While modern technologies are making new applications safer, inappropriate use can lead to unnecessary or unintended radiation exposures and risks. Helical multi-detector CT offers many benefits, e.g. faster image acquisition, better image quality and diagnostic data; but potentially could deliver higher doses especially if inappropriately used because of poor access to or use of guidelines, protocols and standards. This is compounded by practitioner capacity, capability and competency or sub-optimal equipment specification, calibration and performance. The global trend showing population medical radiation exposures equaling to or exceeding natural background radiation is becoming apparent in Africa.

There is an urgent need to enhance justification, optimization, dose monitoring, reporting and awareness. A unified and inclusive stakeholder engagement platform in Africa is most desirable to decelerate and curtail this phenomenon.

AFROSAFE is proposed to serve as a platform to foster Africa’s aspirations for quality and safety in the use of radiation in medicine. Our inspiration has come from EuroSafe Imaging, which was launched in 2014. EuroSafe Imaging has as one of its aims the global promotion of radiation safety and AFROSAFE may be seen as a “spin-off” of EuroSafe Imaging.

AFROSAFE’s goal is to ensure that throughout Africa, the highest achievable standards of radiation quality and safety are met, and the benefits outweigh the harms for all medical radiation exposures. The measures to be deployed are outlined in Table 1.

AFROSAFE’s membership is open to all organizations and individuals having a stake or working in the medical radiation safety field. AFROSAFE will have a secretariat based in one of the centrally located cities in Africa. This secretariat will be responsible for coordinating and reporting activities related to AFROSAFE’s objectives and communicating the outcomes to relevant stakeholders. The secretariat will be tasked with directing and coordinating funding activities.

Some of the leading figures in imaging and radiation safety who are expected to grace this occasion include: Prof. K. Applegate (Image Gently and WFPI, USA), Prof. M. C. Cantone (IAEA), Dr. K. Faulken (UK), Prof. G. Frija (ESR Past President and Chair EuroSafe Imaging Steering Committee), Dr. D. Gilly (IAEA), Prof. M. Grey (USA), Dr. O. Holmberg (IAEA), Dr. M. Perez (WHO), and Prof. M. Rehani (ESR, IAEA). Other participants are expected to come from all countries within Africa.

We are optimistic that the AFROSAFE initiative will ensure the 10 actions outlined in the Bonn Call-for-Action and the requirements of the new Basic Safety Standards are realized in Africa within a specified time period.

(Article courtesy of Prof. Michael G. Kawooya, Past President PACORI; General Secretary African Society of Radiology; and Member, ICRQS)

Table 1: Measures supporting AFROSAFE’s goal

| I. | Promoting and enhancing adherence to global, regional and national policies, standards and programmes aimed at radiation safety. Of special importance is the promotion and adherence to the International Basic Safety Standards (IBSS). |
| II. | Prioritizing programs and actions addressing specific safety needs, e.g. the use of Dose Reference Levels (DRLs), and facilitating their development, implementation, monitoring and evaluation. |
| III. | Promoting evidence-based policies, programmes and actions through linkages between science and governance. |
| IV. | Promoting and maximizing collaboration with all stakeholders involved in radiation safety, on the continent and beyond. |
| V. | Sharing and ensuring continental diffusion of best radiation safety practices through facilitation of dialogue between referrers, radiological medical practitioners, patients, the public and health authorities. |
| VI. | Advocating for strategies to promote appropriateness of imaging requisitions and procedure performance. |
| VII. | Advocating for strategies to use exposures to as low as reasonably achievable. |
| VIII. | Discouraging the use of outdated equipment and encouraging the use of up-to-date equipment. |
| IX. | Sharing of radiation safety resources, data, statistics and infrastructure and promoting their synergistic and corporate use whenever possible. |
| X. | Ensuring sustainability of all programmes and actions towards radiation safety in Africa. |
QUALITY NEWS

Introducing International Organization for Medical Physics (IOMP)

Like the ISR, IOMP is the international body for medical physicists (MP) worldwide. It represents more than 18,000 MP from 84 national member organizations. There are 6 regional organizations covering different regions (Europe, Africa, South East Asia, Asia Pacific, Middle East and Latin America).

Members of the Executive Committee (ExCom) have extensive experience working with radiologists one way or another. For instance, John Damilakis, Chair of the IOMP Education and Training Committee works actively with European Society of Radiology (ESR). Similarly Madan Rehani, Secretary General of IOMP was Director of Radiation Protection with IAEA and was responsible for creating and launching the EuroSafe Imaging program. He has worked with or taught radiologists from more than 60 countries on various topics of quality and safety through his work with the IAEA. Virginia Tsapaki, Chair of the Medical Physics World Board and Anchali Krisanachinda, Treasurer of IOMP are also diagnostic physicists and have actively contributed internationally. Slovak Tabakov, Vice President of IOMP an educator of medical physicists is also active in diagnostics.

The IOMP works with international organizations like the IAEA and WHO. IOMP has collaborated with IAEA on technical and educational materials on radiation protection in diagnostic and interventional radiology besides other topics. http://rpop.iaea.org/RPOP/RPop/Content/AdditionalResources/Training/1_TrainingMaterial/Radiology.htm IOMP was party to joint position statement of IAEA on patient exposure tracking. https://rpop.iaea.org/RPOP/RPop/Content/News/position-statement-IAEA-exposure-tracking.htm We are now working with WHO as an NGO in official relations. Areas of collaboration include strengthening of radiation safety culture in healthcare. IOMP believes that patient dose management actions have to be integrated with image quality.

The World Congress on Medical Physics and Biomedical Engineering http://wc2015.org organized under the banner of IOMP along with other organizations every three years and International Conferences on Medical Physics of IOMP organized in between the two consecutive world congresses have participation of radiologists and have large number of invited and proffered presentations on quality and safety in imaging.

Medical Physics International http://mpijournal.org/content_currentissue.aspx - an official journal of IOMP provides a medium for medical physicists, radiologists and other healthcare professionals in the publication of educational and professional issues.

IOMP looks forward to strengthening collaboration with ISR in promoting the advancement in medical imaging and radiation safety in healthcare.

(Article courtesy of Dr. Kin Yin Cheung President IOMP and Professor Madan Rehani Secretary-General IOMP)

Uganda Society for Advancement of Radiology and Imaging

The Uganda Society for Advancement of Radiology and Imaging (USOFARI) hosted an annual scientific conference from 6th to 8th November in Kampala Uganda.

The theme was “Radiation benefits, quality and safety in healthcare”. The conference objectives included: the benefits of radiation in health care; quality assurance and control mechanisms when using radiation; and radiation safety issues and capacity building to improve the safe utilization of radiation.

The chief speaker was Dr. Claire-Louise Chapple from IAEA. Other speakers came from Uganda and Kenya. Attendees numbered over 120 including general and specialist physicians, radiologists, radiographers and medical physicists.

The topics were covered within the main sub themes of justification and optimization. Some of the topics included:

• An overview of the Bonn Call-for-Action;
• Highlights of the new International BSS;
• Justification of medical imaging and use of referral guidelines in Africa;
• Optimization of radiation protection in pediatric radiology;
• Establishment and utilization of DRLs for radiological procedures;
• Regional and international collaboration in relation to education, training and research in radiation safety for health professionals;
• Handling of radiation incidents and accidents in imaging departments;
• Equipment performance and safety in diagnostic radiology; and
• Strengthening, organizing and establishing a QA program for medical exposures.

The lecture on “Justification of medical imaging and use of referral guidelines in Africa” drew a lot of attention from the participants. Many were not aware of the need for application of referral guidelines to strengthen justification and the requirements set by the new BSS to ensure justification of medical imaging exposures through referral guidelines use.

Participants desired more information and training on the use of guidelines and to be availed the WHO - IRQN guidelines for use when they are ready. It was also noted that the referring physicians countrywide should be made aware of the use of these guidelines in ensuring radiation safety.

(Article courtesy of Professor Michael Kawooya, Secretary General, African Society of Radiology)
PAHO Radiological Quality and Safety Activities

Founded in 1902, the Pan American Health Organization (PAHO) is the world’s oldest international public health agency. Its essential mission is to strengthen national and local health systems and improve health outcomes for all people in the Americas. It enjoys international recognition as part of the United Nations system, serving as the Regional Office for the Americas of the World Health Organization, and as the health organization of the Inter-American System. PAHO is based in Washington, D.C., and has experts at its headquarters, in its 28 country offices, and its four scientific centers. It also partners with nearly 200 PAHO/WHO Collaborating Centers in 15 countries of the Americas and many NGOs.

The Radiological Health Program at PAHO/WHO was established in 1960 and has essentially remained as a unit with activities revolving around assessment, incorporation, regulation, management, and utilization of appropriate health technologies in medical imaging and radiotherapy services, and on radiation protection for the public, workers, patients and the environment in Latin America and the Caribbean.

As part of the efforts to improve quality on imaging services, the Radiological Health Program has responded to local needs in the Region by providing various educational and training activities to improve the delivery of radiology procedures and interpretation of studies. Many radiology health workers have had formal training either in their countries or abroad, however continuing education has been limited in the region. Continuing education in radiology is crucial to keeping radiology health workers well versed and maintains excellence in the services they render to the public. This allows them to remain current in keeping with the radiological advancements as radiology is forever evolving.

In collaboration with partners, the Radiological Health Program has been offering Webinar series on computed tomography, vascular and obstetric sonography as well as physics and pathology in radiography. The Webinar topics are tailored to the needs of the health workers in the region and aim to provide immediate information to improve the performance in the selected subjects. Around 150 participants benefited from this activity. Upon completion of the Webinar series, PAHO / WHO and partners have offered workshops in Jamaica in February 2014 on computed tomography and obstetric sonography (Fig. 5) to supplement the educational activity including hands-on training. Also, a workshop was offered in Haiti for radiographers in April 2014 (Fig.6).

Further training activities included a course on breast biopsy in Grand Cayman, and a workshop on computed tomography and obstetric sonography in Trinidad and Tobago, both in December 2014. A digital radiology course in Nicaragua has been planned for March 2015.

Additionally, PAHO / WHO in collaboration with partners has undertaken activities to improve the capacity of radiology educational centers, such as the University of West Indies in Jamaica, the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT), and the University of Guyana, by donating textbooks (Fig. 7), and in some cases assessing the curricula and providing external lectures.

(Article courtesy of Dr. Pablo Jimenez, Pan American Health Organization)
International Conference on Occupational Radiation Protection

An international conference on “Occupational Radiation Protection: Enhancing the Protection of Workers — Gaps, Challenges and Developments” was organized by the IAEA and co-sponsored by ILO, in co-operation with 15 organizations (EC, ICRU, ICRP, IRPA, ISR, ISRR, UNSCEAR, WHO, and others). It was held in Vienna between 1 to 5 December 2014.

The first occupational radiation protection (ORP) conference was held in 2002. This conference enabled the stakeholders to review and discuss future ORP actions based on the evolving trends including the ICRP recommendations, and the new International and European Basic Safety Standards.

Four hundred and seventy delegates from 79 Member States, representing regulatory authorities and international organizations attended.

The program consisted of an introductory session, 12 dedicated sessions and a concluding session together with ~100 presentations and 100 posters. The conference started by an evaluation of the impact of the 2002 call for action and the conference started by an evaluation of the presentations and 100 posters. The concluding session together with ~100 attended.

The program consisted of an introductory session, 12 dedicated sessions and a concluding session together with ~100 presentations and 100 posters. The conference started by an evaluation of the impact of the 2002 call for action and the topics covered the whole range of ORP.

Some important general points were:

- ORP combines science with social / political values and with experience
- The higher sensitivity of the lenses of the eye to ionizing radiation has been the reason for lower annual exposure limits
- Radiogenic cataract is now termed “tissue reaction”; the threshold, if it exists at all, is below 500 mSv
- The rationale for staying with the LNT hypothesis below 50-100mSv
- It is not legitimate to estimate radiation exposure risk by simply multiplying very large numbers of individuals by very low doses
- Effective dose was introduced for populations, not for individuals
- Higher than previously assumed biological effect of radon and its impact on ORP and the combined, much higher risk of Rn and smoking
- Lessons from Chernobyl and Fukushima accidents
- Air crews represent around 10% of occupationally exposed persons but receive around 75% of the total occupational dose (medicine in comparison 70% and 15%, respectively)
- ALARA networks and their activities, success and financial difficulties
- The medical session and roundtable discussion concentrated on optimizing ORP in medicine: education and training of health professionals in ORP; ORP in interventional procedures; perspectives of the professional bodies, regulators, and industry; and safety culture.

Nine areas of focus

After five days of presentations and intensive discussions, the attendees identified nine key areas of focus that require global attention going forward (http://www.iaea.org/newscenter/news/next-frontier-worker-radiation-protection). The list of actions summarized in Table 2 shall direct ORP activities in the coming years.

The conclusion of the conference referred to the role of professional organizations, such as the ISR and ISRR. There is need for ongoing collaboration between stakeholders. ILO representative Shengli Niu said “. . it is the follow-up activities . . and the collaboration among organizations and professional bodies that’s most important and beneficial . . . “.

(Article courtesy of Professor Peter Vack, International Commission on Radiological Quality and Safety ORP Working Group member and ISR delegate)

Table 2: Nine Areas of Focus for Follow-Up

I. Implementing the existing international safety standards to enhance occupational protection of workers, including assisting Member States in facilitating implementation and encouraging a holistic approach for worker protection.

II. Developing and implementing new international safety guidelines for occupational radiation protection in different exposure situations, including advanced accelerator facilities and interventional radiology.

III. Enhancing assistance to Member States with less developed programmes for occupational radiation protection to support practical implementation of international safety standards.

IV. Promoting exchange of operating experience, particularly for industrial radiography and medical radiology, and including appropriate consideration for human factors, not just among Member States and regulatory authorities, but also among operators, radiation protection officers and vendors.

V. Enhancing training and education in occupational radiation protection to equip workers with the necessary knowledge, skills and competencies to implement protection measures for workers, including periodic refresher training in radiation protection and practical measures to reduce exposures.

VI. Improving safety culture among workers who are exposed to ionizing radiation, including promotion of safety culture by regulatory authorities through outreach and education.

VII. Developing young professionals in the area of radiation protection, particularly for developing nations, through communication, networking, training, research, hands-on experience and participation in technical meetings and conferences.

VIII. Applying the graded approach of the IAEA Radiation Protection and the Safety of Radiation Sources: International Basic Safety Standards (BSS) in protecting workers against exposures to elevated levels of naturally occurring radiation or radioactive materials, including flight crews, miners and other workers.

IX. Convening an appropriate international forum to exchange additional information and analysis of worker protection in different exposure situations, including during nuclear emergencies, to identify lessons learned, implement plans for the protection of workers and helpers, enhance worker preparedness, guide the development of measures for the rapid transition from planned exposure to emergency response, and improve radiation protection in emergencies.
Patient Safety and Error in Medical Imaging

Estimates show that in developed countries as many as one in 10 patients admitted to hospitals is harmed while receiving care. Of every hundred hospitalized patients, 7 in developed and 10 in developing countries will acquire healthcare-related infections. The WHO published “10 facts on patient safety” to highlight this serious public health issue (Table 3).

The stakeholders have increasingly recognized the importance of improving patient safety. In 2002, WHO Member States agreed on a World Health Assembly resolution on patient safety.

Errors occur before, during or after a medical imaging procedure. An incident in isolation would not necessarily result in harm, but deficiencies in the barriers could lead to actual harm.

Incidents and adverse events while inevitable are preventable. The aim is to identify the potential risks, understand the contributing factors and develop and implement controls and corrective actions.

The Australian Patient Safety Foundation organizes biennial conferences focusing on error in medical imaging to raise awareness and facilitates improvement in patient safety in medical imaging. The conference resulted from work conducted through the Radiology Events Register (RuER), an incident reporting and learning system supported by the Royal Australian and New Zealand College of Radiologists.

The first two conferences focused on interdisciplinary communication and the role of human factors. The third conference was held in Adelaide in November 2014. The theme was ‘Making imaging safer’ through information technology, informatics, human factors and systems approaches, and quality improvement.

Table 3: 10 facts on patient safety

1. Patient safety is a serious global public health issue
2. One in 10 patients may be harmed while in hospital
3. Hospital infections affect 14 out of every 100 patients admitted
4. Most people lack access to appropriate medical devices
5. Unsafe injections decreased by 88% from 2000 to 2010
6. Delivery of safe surgery requires a teamwork approach
7. About 20%–40% of all health spending is wasted due to poor-quality care
8. A poor safety record for health care
9. Patient and community engagement and empowerment are key
10. Hospital partnerships can play a critical role

The two days event featured lectures by stakeholders from different disciplines and included three concurrent workshops. By invitation Drs. Maria Perez (WHO), Ola Holmberg (IAEA) and Lawrence Lau (ICRQS), were invited to give a presentation on “Radiation Safety Adverse Events - Reporting and Learning in Health Care”

The WHO Patients for Patient Safety London Declaration advocated “…patients be partners . . . to prevent avoidable harm in health care . . . reduce healthcare errors a basic human right . . .”

Minimization of adverse events in medical use of radiation is specifically mentioned in the new BSS, Bonn Call-for-Action, and WHO Global Initiative on Radiation Safety in Health Care Settings.

Incident reporting and learning systems collect data, classify incidents, develop controls and advocate use. Examples of radiology specific systems were mentioned in the last edition of Quality News. The WHO Information Model for Patient Safety (IMPS) and Minimum Information Model (MIM) are inter-cluster initiatives and could potentially serve as the basis for a more comprehensive incident reporting system.

Patient safety is a joint responsibility. Team members in medical imaging facilities reduce incidents and adverse events by adopting safety culture, use reporting and learning and apply risk controls in everyday practice. Stakeholders in healthcare systems collaborate to develop IT, informatics and system-based solutions to reduce incidents. Improvement opportunities include strengthening awareness, access and use of risk controls and harmonizing reporting and learning.

Sir Liam Donaldson, Chair, World Alliance for Patient Safety said “It is the action we take in response to reporting – not reporting itself – that leads to change”.  

1 www.who.int/features/factfiles/patient_safety/en/  
www.ausconfonerrorinmedicalimaging.com.au  
www.who.int/patientsafety/patients_for_patient/pdfs/london_declaration_2010_en.pdf
Patient engagement for radiation safety in medicine is an important priority for the WHO Patients for Patient Safety (PFPS) Programme of the Service Delivery and Safety (SDS) Department.

Better-informed patients and practitioner-patient communication empower patients and facilitate more informed decision. These are some of the key strategies used to minimize unjustified or unnecessary use of medical imaging procedures, especially as a result of demands from uninformed patients.

In December 2012, Margaret Murphy, a PFPS champion from Ireland presented patients’ perspective at the International Conference on Radiation Protection in Medicine held in Bonn, Germany. Since then, PFPS has actively contributed to activities under the WHO Global Initiative on Radiation Safety in Health Care Settings, which is led by the Department of Public Health, Environmental and Social Determinants of Health (PHE), with Dr. Maria Perez as the focal point. PFPS brings the patient’s voice to the discussions and raises awareness of radiation safety among patient and provider networks.

PFPS participated in the International Consultation on the Global Initiative on Radiation Safety in Healthcare Settings, held in September 2013, in Geneva. Birgitte Holmark, a PFPS champion from Denmark was the patient’s voice on behalf of the PFPS Global Network at this high-level consultation.

PFPS’s participation in a multi-stakeholder meeting on justification of individual exposures, held on 26th September 2014 in Brussels, was another example of integrating patient engagement into efforts to improve radiation safety in medicine (Fig. 8).

PFPS champions have played an important role in advocating patients’ and healthcare users’ perspectives to healthcare providers and policy-makers. The presentation by Katrine Kirk, a PFPS champion from Denmark, at the 34th meeting of the IAEA Radiation Safety Standards Committee meeting in July 2013, was hailed as “an eye opener” by the high-level policy-makers. Katrine’s keynote presentation at the 4th European Regional IRPA Congress held on 25th June 2014 in Geneva, advocated the importance of patient engagement for radiation safety at global level.

The recent WHO International Consultation on “Justification of the Use of Computed Tomography (CT) for Individual Health Assessment (IHA) of Asymptomatic People”, held on 15-17 October 2014, in Munich, Germany was another example of how healthcare providers and policy-makers have embraced the patients’ voice into efforts for improving the safety and quality of medical imaging. Stephanie Newell, a PFPS champion from Australia, participated in this event and provided the patient’s perspective to this issue. She delivered a presentation on risk communication and shared decision-making and served as a rapporteur for one of the work groups. The call for engaging patients to promote constructive dialogue between patients and healthcare providers, thus enabling both to make informed decisions, was reiterated.

Meaningful engagement of patients, their families and the communities and empowering them to be knowledgeable and as informed partners are key to promoting safe, high quality and responsive healthcare services, including radiation medicine.

In October 2014, the PFPS Programme hosted an Expert Consultation towards the development of a WHO Framework on Patient and Family Engagement which will further guide such meaningful engagement. In the discussions, Dr. Maria Perez emphasized the importance of patient and family engagement in efforts to improve radiation safety in medicine. We look forward to continuing this collaboration.

(Article courtesy of Nittita Prasopa-Plaizier, WHO Patients for Patient Safety Programme. Credits: Dr. Maria Perez, Margaret Murphy, Katrine Kirk, Stephanie Newell, Birgitte Holmark, Katthyana Aparicio, and Dr. Ed Kelley)
The American College of Radiology has recently established a Quality Management Committee, charged with harmonizing and strengthening the efforts of the many excellent quality and performance-improvement portfolios that exist under the ACR’s umbrella. Chaired by Jonathan Kruskal, MD, PhD, Chairman of Radiology and Professor of Radiology at Harvard Medical School, the committee comprises recognized leaders representing such diverse areas as quality and value metrics, peer review, point-of-care quality enhancing tools, Practice Quality Improvement methodology, informatics, safety, and education.

The emergence of a new value paradigm in the provision of healthcare in the United States directly links the quality of care, including appropriateness, to efforts at reducing costs. Healthcare reform changes in the United States are refocusing and linking future reimbursement to the provision of value-added care, to customer satisfaction and to the global contribution to population health.

One timely focus of the committee will be to identify, disseminate and benchmark relevant value metrics that are able to reflect the contribution of radiologists to each patient’s episode of care. This will require a shift and expansion from the use of traditional process and outcomes metrics to those that reflect the real impact and contribution of diagnostic and image-guided procedure services to the health of each patient, and to the population as a whole. This will require development and dissemination of enabling point of care tools.

Many current process metrics provide a narrow perspective of practice performance, and the emerging metrics will need to reflect the larger more meaningful contributions of radiologists (Figure 9).

Two additional goals of the committee will be a) to help practices develop effective quality infrastructures through the training and even certification of Radiology Quality Officers (RQO’s), and b) to facilitate training and completion of effective Practice Quality Improvement (PQI) projects, a requirement for radiologist Maintenance of Certification in the United States.

No on-going mentored peer or team-training opportunities currently exist for helping to develop future quality leaders in our field, and this timely opportunity is one the committee is looking forward to embracing. The requirement for satisfactory completion of PQI projects is finally causing radiologists to embrace the basics of effective improvement efforts, and to begin to actively participate in such projects. Figure 10 illustrates how project ideas can be identified and translated into effective improvement.

The Quality Management Committee looks forward to working with our colleagues around the world to share best practices, and to learn from your expertise.

(Article courtesy of Dr. Jonathan B. Kruskal, Chair, ACR Quality Management Committee)
ESR EuroSafe Imaging – Current and Pending Activities

EuroSafe Imaging, the European Society of Radiology’s (ESR) flagship radiation protection campaign, was launched at the European Congress of Radiology 2014 to support and strengthen medical radiation protection following a holistic, inclusive approach. To put this mission into action, the EuroSafe Imaging Steering Committee issued the 12-point EuroSafe Imaging Call for Action in September 2014.

The EuroSafe Imaging Call for Action (Figure 11) is designed to support the implementation of the Bonn Call-for-Action and the ESR’s mission of improving quality and safety in medical imaging.

Significant progress has been made on several of these items (Figure 12):

- Action 1: Conceived as a campaign to increase awareness of radiation protection, EuroSafe Imaging has already published articles in journals and newsletters, issued press releases, and created a promotional video (https://www.youtube.com/watch?v=jinJ3nwYDCU).

- Action 2: The development of the ESR's clinical audit tool will be completed for its launch at ECR 2015 (Action 2), and action on diagnostic reference levels (Action 3) is under way since the ESR assumed the lead of a European Commission project on paediatric DRLs.

- Action 6: Education and training to improve radiation protection (Action 6) is of particular importance to the ESR, demonstrated through the inclusion of 12 modules on radiation protection in its e-learning platform 'Education on Demand'.

Implementation of Action 7 started with the launch of the Is your Imaging EuroSafe? survey series in November 2014 (http://www.eurosafeimaging.org/survey). The aim of these surveys is to build a European repository based on DRLs for those clinical indications most helpful for self-benchmarking.

Implementation of Action 8 started with the launch of the Is your Imaging EuroSafe? survey series in November 2014 (http://www.eurosafeimaging.org/survey). The aim of these surveys is to build a European repository based on DRLs for those clinical indications most helpful for self-benchmarking.

Joining forces with other stakeholders is an essential part of the structure of EuroSafe Imaging. Not only does the campaign directly incorporate external stakeholders through the EuroSafe Imaging Steering Committee, it also actively engages with related radiation protection initiatives such as Image Wisely or Image Gently (Action 12). The ESR also cooperates with the research platform MELODI (Multidisciplinary European Low Dose Initiative) and other medical associations to develop a strategic research agenda for radiation protection (Action 7).

The ESR also enhanced its cooperation with patients (Action 11), as the Patient Advisory Group of Medical Imaging, founded in 2013, developed a 'driver diagram of patient-centered care'.

EuroSafe Imaging will also feature prominently again at ECR 2015 (http://www.eurosafeimaging.org/wp/wp-content/uploads/2014/10/EuroSafe-Imaging_ECR-2015-activities_A5.pdf) where activities will include a dedicated poster exhibition, six scientific sessions and an information booth.

To support the ESR and EuroSafe Imaging in improving radiation protection in Europe, please sign up to become a Friend of EuroSafe Imaging (http://www.eurosafeimaging.org/friends-of-eurosafebeeld/vrienden) and show your commitment to quality and safety for Europe’s patients!

Go to www.eurosafeimaging.org for more information on EuroSafe Imaging.

(Article courtesy of Professor Guy Frija, Chair, ESR EuroSafe Imaging Steering Committee)
As a key stakeholder and global voice for the radiographic community, President, Fozy Peer felt it is an important strategy and priority for the International Society of Radiographers and Radiological Technologists (ISRRT) to create an action plan in response to the “Bonn Call-for-Action” document.

The meeting “International Conference on Radiation Protection in Medicine - Setting the Scene for the Next Decade” was held in Bonn, Germany, 3 - 7 December 2012 to identify stakeholder responsibilities and priorities in relation to radiation protection in medicine for the next decade.

As a result an ISRRT subcommittee was created from the current board, comprising of Donna Newman, Director of Professional Practice, Stewart Whitely, Treasurer and Alain Cromp Director of Public Relations.

The sub-committee’s tasks were to review ISRRT’s current involvement and previous activities and create an action plan with key strategies and priorities that the ISRRT could participate in and commit to the strengthening of outcome of the Bonn Call-for-Action (Fig. 13).

The sub-committee reviewed and grouped the relevant activities that were related to the Bonn Call-for-Action and the New Basic Safety Standards that the ISRRT is currently participating in or had participated since the 2012 Bonn conference.

Through this exercise, the ISRRT sub-committee members identified the key areas that the ISRRT had already contributed or is currently contributing to aspects of the Bonn Call-for-Action. With this information the sub-committee developed recommendations, strategies and actions that were needed to enhance radiation protection in medicine globally. Examples of the ideas that the ISRRT will focus on in the next year and beyond include:

**Action 1**: Enhance the implementation of the principle of justification - the ISRRT will develop a decision tool on the role of the radiographer in justification as part of the healthcare team. This will be posted on the ISRRT website and presented to the HERCA for consensus along with other relevant stakeholders.

**Action 2**: Enhance the implementation of principle of optimization of protection and safety - the ISRRT will continue to promote and fund workshops in the developing countries focusing on optimization and the use of DRL’s, and contribute to funding research to establish the dose range for specific examinations and dose recording.

**Action 4**: Strengthen radiation protection education and training of health professionals - the ISRRT is working on a new policy and guidance documents to support the development of simple training documents for radiographers in different languages.

**Action 10**: Strengthen the implementation of safety requirement globally - the ISRRT is working to produce a policy document which supports and advocates the implementation of the new BSS through publications, webpages and workshops.

While the ISRRT has proposed a range of projects for each one of the 10 Bonn Call-for-Action items, only selected examples are described in this edition of Quality News. More details are found in a document entitled: “ISRRT Action Plan in Response to the Bonn Call-for-Action”, which is available from: www.isrrt.org/.

(Article courtesy of Donna Newman Director Professional Practice ISRRT, Stewart Whitley Treasurer ISRRT, and Alain Cromp Director of Public Relations ISRRT)
UNSCEAR’s Global Survey on Medical Radiation Usage and Exposure: Bonn Call-for-Action Update

The General Assembly of the United Nations (UN) established the Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) in 1995 to assess and report the levels, effects and risks of exposure to ionizing radiation from all sources, including that is used in medicine.

It is known today that medical radiation exposure is by far the largest artificial source of radiological exposure in many countries and it continues to increase considerably.

Information on the use of radiation for treatment and diagnosis and the associated doses is obtained by reviewing the scientific literature and through population-based surveys. Over the past 30 years, UNSCEAR has regularly assessed the levels and trends of medical exposures globally and has carried out surveys to collect the required information from UN Member States. These surveys are also used to identify gaps in radiation treatment capabilities and possible unwarranted dose variations for similar radiological procedures.

UNSCEAR launched a new Global Medical Exposure Survey in 2014 by inviting the UN Member States to submit data on medical radiological exposure from diagnostic and interventional radiology, nuclear medicine and radiation therapy. The Committee deploys a dedicated online platform (Fig. 14 www.survey.unscear.org) to facilitate secure submission, exchange and archival of data. The World Health Organization (WHO) supports this new UNSCEAR survey, considering the data on radiological exposure in medicine as public health relevant.

UNSCEAR’s surveys and evaluations have provided the scientific foundation to improve our understanding of the levels of radiation to which individuals are exposed to and of the possible radiation-induced health effects.

In the past, UNSCEAR’s findings have been used to establish frameworks for radiation protection activities in medicine such as the International Action Plan for the Radiological Protection of Patients established by the International Atomic Energy Agency (IAEA) in 2002 and WHO’s Global Initiative for Radiation Safety in Health Care Settings launched in 2008. More recently, UNSCEAR has been collaborating closely with the IAEA and WHO to implement Action 6 of the 2012 Bonn Call-for-Action (Fig. 15), which advocates increased availability of improved global information on medical and occupational exposures in medicine.

UNSCEAR and WHO jointly with the International Radiation Protection Association (IRPA) organized workshops in 2014 during the three IRPA Regional Congresses in Malaysia, Switzerland and Morocco to raise awareness about UNSCEAR’s new survey and to increase the number of Member States providing data on the use of radiation in medicine. In this context, Member States were invited to nominate national contact persons (NCPs) and to register subsidiary technical experts on the UNSCEAR online data collection platform.

(Article courtesy of Dr. Ferid Shannoun, Scientific Officer, United Nations Scientific Committee on the Effects of Atomic Radiation)
QUALITY NEWS

European Radiographers Working Together to Promote Best Practice in Medical Imaging

I would like to start by thanking the ICRQS for this initiative and for continuously promoting networks between the medical imaging and radiotherapy communities.

November is by definition a month dedicated to medical imaging around the world, with several initiatives to celebrate Roentgens’ discovery. The 8th of November of 2014 was a very intense day for the European radiographers. Representatives from National Societies and Universities came together for a meeting in Coimbra, Portugal.

The European Federation of Radiographer Societies (EFRS), during its Annual General Assembly (AGM), elected a new Board for the period 2014-2017 (Fig. 16). The new EFRS President Csaba Vandulek, from Hungary, left a clear message, that together with his team, EFRS will continue to promote and develop the radiographer profession in Europe, to improve the delivery of quality care to the patients.

following the AGM, the EFRS representatives participated in an outstanding session focusing on “Patient Safety in Medical Imaging” at the CIR conference, organized by the Coimbra Health School. The participants learned the different aspects of patient safety in medical imaging from an international expert panel (Fig. 17) consisting of Dr. Maria Perez (WHO), Dr. Ola Holmberg (IAEA), Dr. Georgi Simeonov (DG-ENER, EC) and Dr. Lodewijk Van Bladel (FANC).

A very important discussion took place relating to the implications of the implementation of new European Directive 2013/59/EURATOM in European Member States, namely the issues regarding education and training of health professionals in radiation protection.

The EFRS is committed to and strongly advocates the adoption of KSC (Knowledge, Skills and Competences) in radiation protection into radiographer training curriculum across Europe. These elements were defined in the MEDRAPET Guidelines and published by the European Commission in RP#175.


As a final message, I would like to stress that the development and implementation of a patient safety culture in medical imaging and radiotherapy department is necessary to improve the professional standards of practice, implement lifelong learning programs and build a teamwork document by defining the roles and responsibilities of medical doctors, radiographers and medical physicists.

(Article courtesy of Professor Graciano Paulo, Coimbra Health School, Immediate Past President, EFRS)
QUALITY NEWS

USEFUL LINKS

The following is a collation of the links mentioned in this edition of Quality News. These links are correct at the time of publication.

Many links provide useful and downloadable training material.

- 3rd Australasian Conference on Error in Medical Imaging
  http://www.ausconfonerrorinmedicalimaging.com.au

- 4th African Regional IRPA congress 2014
  http://afrirpa04.com

- Alliance for Radiation Safety in Pediatric Imaging (Image Gently Alliance)
  http://www.imagegently.org

- Annuals of the ICRP
  http://www.icrp.org/publications.asp

- Bonn Call-for-Action brochure

- EuroSafe Imaging
  http://www.eurosafeforg.org

- EuroSafe Imaging Call for Action
  http://www.eurosafeforg.org/about/call-for-action

- European Congress of Radiology 2015


- Friends of EuroSafe Imaging
  http://www.eurosafeforg.org/friends-of-eurosafeforg.org

- IAEA International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers – Gaps, Challenges and Developments 2014

- IAEA Radiation Protection of Patients training material
  http://rpdp.iaea.org/RPOP/RPsP/Content/AdditionalResources/Training/1_TrainingMaterial/Radiology.htm

- IAEA Safety Reports Series
  http://www-pub.iaea.org/books/IAEABooks/Series/73/Safety-Reports-Series

- ICRP Educational Downloads
  http://www.icrp.org/page.asp?id=35
QUALITY NEWS

USEFUL LINKS

- ICRP Paediatric Radiology Posters
  http://www.icrp.org/page.asp?id=13
- Image Gently in Dentistry Campaign
  http://www.imagedigitally.org/Procedures/Dental.aspx
- International Action Plan for the Radiological Protection of Patients
- International Conference on Occupational Radiation Protection - Nine Action Items
- Is your imaging EuroSafe?
  http://www.eurosafeimaging.org/survey
- ISRRT Action Plan in response to Bonn Call-for-Action
  http://www.isrrt.org/isrrt/default.asp
- Joint Position Statement on the IAEA Patient Radiation Exposure Tracking
- Medical Physics International
  http://mpijournal.org/content_currentissue.aspx
- Medical Radiation Protection Education and Training (MEDRAPET)
  http://www.eurosafeimaging.org/medrapet
- PAHO Radiology Educational Webinars
- Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (BSS) 2014
  http://www-ns.iaea.org/standards/review-of-the-bss.asp
- UNSCEAR Global Survey Platform
  www.survey.unscear.org
- World Congress on Medical Physics and Biomedical Engineering 2105
  http://wc2015.org
- WHO 10 facts on patient safety
  http://www.who.int/features/factfiles/patient_safety/en/
- WHO Patient Safety
  http://www.who.int/patientsafety/en/
- WHO Patients for Patient Safety Programme
  http://www.who.int/patientsafety/patients_for_patient/en/
- WHO Patients for Patient Safety London Declaration
  http://www.who.int/patientsafety/patients_for_patient/pfps_london_declaration_2010_en.pdf?ua=1

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