Radiation Risk Communication
in Paediatric Imaging

Global Initiative on Radiation Safety in Health Care Settings

Workshop Report

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Delegates at the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Bonn, Germany on 2nd December 2012 for the WHO Radiation Risk Communication in Paediatric Imaging Workshop

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Radiation Risk Communication in Paediatric Imaging Workshop

Global Initiative on Radiation Safety in Health Care Settings

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1. Executive summary

The World Health Organization (WHO) is conducting a Global Initiative on Radiation Safety in Health Care Settings (GIRSHCS) and radiation protection of children is one of the initiative’s priorities. Children are considerably more sensitive to the effects of radiation than adults; have a longer life span to develop long-term radiation-induced effects; and could receive a higher dose than necessary if adult parameters are used in paediatric imaging. However, awareness of radiation risks and radiation exposures in paediatric imaging procedures amongst referrers, patients and the public is low. There is a need to develop and implement a risk communication tool to underpin Good Medical Practice and educate the health care professionals. The targeted messages should be clear, concise and tailored to a specific stakeholder group. Message mapping is important. Risk communication in paediatric imaging is a team action. Professional experts contribute by crafting and tailoring evidence-based key messages and communication experts enhance these by fine-tuning the language and delivery to meet different end-user needs. As key stakeholders, patients and carers, in addition to health care professionals must be involved and represented in all processes, preferably at an early stage. This Radiation Risk Communication in Paediatric Imaging Workshop aims to review the emerging issues and trends, identify the gaps and needs, develop and improve key messages for different stakeholder groups, and evaluate feedback for a drafted communication tool. Based on the Workshop findings, the communication tool will be finalized. This tool together with other Global Initiative and other related actions would contribute to improvements paediatric imaging practice.

2. Rationale

2.1 Global Initiative on Radiation Safety in Health Care Settings

In 2008, the WHO launched a Global Initiative on Radiation Safety in Health Care Settings (GIRSHCS) and it is currently conducting activities under three areas of work:

- Risk assessment: to assess risks and potential impacts;
- Risk communication: to engage and communicate with the stakeholders; and
- Risk management: to implement policies and health interventions.

The WHO advances medical radiation and health related activities by facilitating the adoption and application of regulations; evaluating radiation medicine and medical imaging procedures; facilitating workforce educating and training; providing advice for the incorporation of appropriate technologies; and publishing, co-sponsoring and disseminating guidance tools and technical documents.
2.2 Objectives

The objectives of Global Initiative are to mobilize the health sector towards safer and more effective use of radiation in health and to improve patient care by identifying Member States (MS) needs and improving capacity, determining WHO’s roles, identifying priorities, and defining how best to complement other international, regional and national actions to improve radiation safety in health care settings. These objectives will be achieved by developing and facilitating the implementation of evidence-based guidance tools, recommendations, and policies; and providing technical support to and facilitating capacity building of MS by focusing on the public health aspects and considering the risks and benefits of the use of radiation in health. It aims to improve MS capacity to: assess risks and potential impacts; develop and implement policies that take into account of the potential health impacts, costs and benefits; monitor and evaluate the effectiveness of policies and interventions; and engage and communicate with stakeholders.

2.3 Risk communication in paediatric imaging

Health professionals generally have a low awareness of the exposures involved in radiologic procedures and the magnitude of radiation-related health risks. An area of particular concern is the unnecessary use of radiation when clinical evaluation or alternative imaging not using ionizing radiation could provide an accurate diagnosis.

Radiation protection of children is one of the Global Initiative’s priorities. Risk communication is an exchange of views between those responsible for assessing, minimizing and controlling radiation risks and those who may be affected. Children are considerably more sensitive to radiation than adults; have a longer life span to develop long-term radiation-induced health effects like cancer; and could receive a higher dose than necessary if adult parameters are used in paediatric imaging.

Procedure justification, optimization of radiation protection and diagnostic data and error minimization of radiologic procedures are particularly critical in paediatric practice. There is a need to promote a focused educational campaign to empower health professionals, patients and families to make informed decisions about the use of radiation for medical imaging procedures. The aim is to raise awareness with a positive message; improve communication on the benefits and risks; and strengthen advocacy towards a safer and more appropriate use of radiation in health care and risk prevention. One of the key measures is by the development and use of guidance tools tailored to improve radiation risk communication.

Building on the momentum from a workshop on radiation risk communication held in the WHO Headquarters in 2010, a second Workshop on Radiation Risk Communication in Paediatric Imaging was conducted on 2nd December 2012 in Bonn, Germany. The main objectives of this Workshop are:
To test a tool for radiation risk communication in paediatric imaging;
To identify gaps and needs and collect stakeholders feedback; and
To improve informational, motivational and persuasive messages tailored to different end-users for effective radiation risk communication of radiation benefits and risks.

3. Radiation Risk Communication in Paediatric Imaging Workshop

3.1 Participants

56 participants, consisting of individual experts from 19 MS and representatives from 12 international organizations, UN agencies, professional organizations, scientific societies, academic institutions, research institutions, patient advocacy organizations, regulatory authorities and Health Ministries attended the Workshop. A list of the delegates is appended in Appendix 1 of this report.

3.2 Format

The Workshop was held on 2nd December 2012 and hosted by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in Bonn. The Workshop agenda is presented in Appendix 2 of this report.

The one-day program started with an overview of issues and trends, covering: health risks of radiation exposure early in life, making the right choice in paediatric imaging and practice improvement by a radiation protection culture. The challenges and opportunities in radiation risk communication in paediatric imaging were presented, including public health, patient, carer, and health care provider perspectives.

Small groups were assigned to discuss good practices, map key messages, and review experience and lessons from recent radiation risk communication actions. The message mapping process aimed to identify and discuss practical tips, traps, and pitfalls, i.e. what to say, how to explain, and how to tailor message to a specific audience. A summary of these discussions and a preliminary feedback for the radiation risk communication tool were then presented.

4. Proceedings

4.1 Setting the scene: issues and trends

4.1.1 Health risks of radiation exposure early in life

The balance of evidence from epidemiologic, animal and mechanistic studies favor a simple
proportionate relationship at low doses between radiation exposure and cancer risk. However, there are challenges when attributing health risks to medical radiation exposure due to uncertainties associated with risk assessment at low doses, and insufficient statistical power in epidemiological studies. Based on the “EPA radiogenic cancer risk projections for the United States”, the major sources of uncertainty include: sampling error, applying risk from life span studies to the U.S. population, dose and dose-rate effectiveness factor, and age / temporal dependence. Laboratory studies suggest other factors that could influence cancer risks, e.g. adaptive response, bystander effect, and genomic instability etc. The significant of these elements in human carcinogenesis is unclear. The radiation risks in children are higher but this lifetime attribute risk decreases with age. For example, as a result of the same exposure, the incidence of cancer is approximately double for the newborn when compared to a 10-year-old child.

4.1.2. Pediatric imaging today: making the right choice

The principles of radiation protection include justification and optimization. Imaging modalities not employing ionizing radiation should be selected first if and when appropriate. To minimize unjustified procedure and exposure, the referrers should consider a number of questions before requesting the procedure:

- Has the procedure been done already?
- Will it affect patient management and do I need it?
- Do I need it now?
- Is it the best procedure?
- Have I explained clearly to the radiologist why it is needed?

The availability of evidence-based referral guidelines and the promotion of their use by education and audit are encouraged.

4.1.3. Paediatric imaging today - procedures, doses, child-sizing initiatives

Imaging is frequently used in children and this is increasing. The radiation doses in children can be high and variations are large. Effective radiation protection in paediatric imaging must include education. The Imaging Gently (Alliance for Radiation Safety in Paediatric Imaging) Campaign aims to improve paediatric imaging and to change practice by increasing awareness of the opportunities to promote radiation protection in the imaging of children. It provides information in paediatric imaging procedures including translations and recommends child-size protocols. The procedures employing ionizing radiation are targeted, covering CT, fluoroscopy, nuclear medicine, and dental radiology. It advocates and collaborates with other stakeholders for an appropriate use of procedures and the application of child-size exposures. Judged by the visits to the website and the result of surveys, the
campaign is very effective, leading to a change in practice and a lowering exposure to more than half of those surveyed.

4.1.4. A culture shift to improve practice: radiation protection culture

The Four T’s of Leadership: truth, trust, teamwork and training, and the Five Rights of Imaging: right test, right order, right way, right report and right follow-up action are used to improve practice performance and radiation protection culture.

4.1.5. Discussion

There are uncertainties when attributing health risks at low levels. The media often publish negative information. It is desirable for health professionals to have the necessary media skills to underpin effective communication of the key issues in a way the public understands. Communication involves different stakeholders. There is a need to strengthen the education and training of health professionals including general practitioners.

4.2 Creating a dialogue in paediatric health care, opportunities and challenges

4.2.1. Risk communication in public health

In a 2011 Gallup International survey on communication between doctors and patients, doctors’ performance trended downwards basing on patient perception, trust, satisfaction, and their compliance to medical advice. There is an increasing dependence on web-based health advice. Patient-centred communication is best because it yields diagnostic information, builds rapport and indicates to the patients that they are being listened to and what they have to say is important. Some practical tips to successful risk communication in public health are:

- Defining the desired outcome;
- Knowing the audience and being aware of the active resisters (blockers) and passive resisters (avoiders) compare to the active supporters (champions) and passive supporters (silent boosters);
- Choosing the right strategy and acknowledging patient perceptions;
- Tailoring the message to the stakeholder;
- Understanding emotions and managing these accordingly to achieve the desired outcome; and
- Being aware of the communication gap between doctors and patients and by closing this gap.

4.2.2. Communication between referrers and radiological practitioners

From a regulator's perspective, risk communication is pivotal and complex, and has to address different scenarios and interactions. The scenarios cover healthcare, biomedical research, and prenatal and medico-legal exposures. The interactions involve patients, medical practitioners, biomedical researchers, radiological practitioners, medical radiation technologists, medical physicists, and Ethics
Committees.
The stakeholders for communication on procedure justification are the patient, referrer, and radiological practitioner; and optimization are the radiological practitioner, radiological technologist, and medical physicist. In biomedical research, there is no specific justification for an individual volunteer; instead the exposure has to be justified "generically". It should be in accordance to the Helsinki Declaration and is subjected to the approval of an Ethics Committee or a body assigned to fulfill this task. In biomedical research, the researcher communicates radiation risks to the Ethics Committee or the institutional body on the one hand and discusses these risks with the patient and radiological practitioner on the other.
The elements underpinning successful risk communication include: accepting and involving the counterpart as a legitimate partner; being honest, frank and open; speaking clearly and with compassion; coordinating and collaborating with other credible sources; and meeting the need of the media.

4.2.3. Role of family doctors

Family doctors look after four times as many patients when compared to doctors from academic institutions. They play important roles, because family doctors are the first and last point of patient contact in an episode of care. Countries with a poor family doctor system have poorer health outcomes. The diseases seen in family practice could at times be complex and time consuming. One of the challenges in family practice is the access to and application of evidence-based recommendations and tools. It is important for the patients and family doctors to be actively involved in guideline development. The importance of relationship building and effective communication was stressed.

4.2.4. Role of other health care providers

Radiographers and radiological technologists are front line practitioners in paediatric imaging and play key roles in radiation reduction by acting as family and patient advocates; using child size protocols and appropriate technique; and ensuring diagnostic images are obtained. In practice, this includes appropriate use of immobilization devices, distraction tools, short exposure time, limited views, collimation, lead shielding and ALARA. In CT, it is important to adjust the dose to patient size; to use automatic dose reduction; to standardize and regularly review protocols; to analyze exposures; and to participate in quality and accreditation programs.
Radiographers collaborate with radiologists and medical physicists as a team to ensure radiation protection by justification and optimization. For procedure justification, these include the use of referral guidelines and the communication of benefits and risks to patient and parent. The optimization of radiation protection and diagnostic data include contributions to equipment commissioning,
maintenance, quality control and quality assurance programs. The importance of continuing professional development was stressed by keeping up-to-date with international guidelines in optimization and best practice for dose reduction. Radiation protection is a shared responsibility; a team approach will ensure dose-optimized and diagnostic images are obtained in pediatric imaging.

4.2.5. The view of patients and parents

Some of the issues for patients or carers include low awareness, knowledge and understanding in radiological procedures including the benefits and risks; and variations in the choice and performance of procedures including exposure. There is a need to improve: access to information; practitioner education; and communication to facilitate informed discussion and choice of options.

Public debate has generated disproportionate anxiety about radiation risks and it is important to ensure communication is factual, evidence-based and not alarming. Education addresses information deficit, removes misconceptions, and allows informed consent or refusal. The joint decision, consent or refusal, should be documented in the medical record.

Supporting actions to patients and general practitioners include: access to medical records, exposure tracking and dose record for patients; education and means to support gatekeeper role for general practitioners; and information sharing for both including better use of discharge summaries. The identification and implementation of measures to improve reporting and learning; partnership and collaboration; openness and transparency; and engagement of the stakeholders are the ways forward.

For example, recognition of patients’ role and participation in policy development is encouraged.

4.2.6. Discussion

When developing guidance tools, it is useful to take into account of the social setting and the issues that are of interest or concern to the end-users. Good communication is specific and individually tailored. A useful communication tool should be simple to use and practical. It is important to consider the recipient’s emotions. A challenge relating to equipment manufacturers and vendors is the need for a standardized terminology. The concern on exposures associated with the use of second hand equipment was raised.

4.3 Case studies

The purpose is to share experience and lessons from recent communication projects in health care, focusing on radiation benefits and risks and paediatric imaging. This is a review of what has been done in response to a particular challenge and will be a useful guide to future actions.

4.3.1. Radiologists, referrers, patients and carers: The RCR experience

The Royal College of Radiologists (RCR) has been providing guidance to radiologists, referrers,
patients, carers, and regulators on an appropriate use of radiologic imaging for many years. The approaches include: publication of referral guidelines and other inter-collegiate guidance documents; hosting a public information section in the RCR website; provision of education and training to radiologists, e.g. in justification and optimization; and advocacy in the drafting of related legislations and regulations.

Radiologists communicate to different stakeholders. For the patients, the examples include procedure information with appointment letter, web-based information, and direct discussions with patients and patient liaison groups. For the referrers, the examples include direct discussions, referral guidelines, clinical meetings, educational message in reports, web-based information and interaction with professional groups.

The collaboration with and participation of other stakeholders in the development of guidance tools, e.g. referral guidelines is important. Following the release of referral guidelines, the overall referrals fell by 13%. Randomized trial of educational message in reports was effective by reducing use by up to 20% without affecting the quality of referrals.

The strengths supporting the use of referral guidelines in the UK include a relatively uniform National Health Service system, the acceptance of radiological advice by the referrers, and the advice is provided by a trusted source for over 20 years. The challenges are resource-intense guideline development, guidelines dissemination, implementation, and uptake. The opportunities include sharing knowledge and resources, implementing electronic requesting system, monitoring by national clinical audits, and strengthening collaborations with referrers, regulators, professional organization, and patient groups.

4.3.2. Dialogue between scientists and the public

Following the Fukushima nuclear power plant accident, the issues that the public has concern about and expects reliable information from the scientific leaders and authorities include: radiation protection, including dose measurements; exposure estimation and accuracy, including external exposure, internal exposure and dosimetry; cancer risk estimation; and the impacts of the accident to daily life. The common queries on everyday routine include food and water contamination and decontamination; outdoor activities for children; and the justification for radiologic procedures etc. Scientific information is delivered to the public via the Internet, public lectures, seminars, and telephone consultations. This communication is bi-directional between the scientists and the public: about anxiety and unknown risks on the one hand and trustworthy scientific information on radiation effects, risks and protection on the other. The challenge is limited resources for an individual institution. Apart from attending scientific lectures or surfing the Internet the public obtains information from the
media and friends. However some of such information may not be scientifically robust. Individuals have different points of view and sense of value.

4.3.3. Dialogue between paediatric radiologists and referrers and parents

Following the aftermath of the Fukushima accident, there is increasing public awareness and anxiety on radiation risks and radiation-related health effects. There is a reduction in the use of CT due to deceased request, and patient refusal or cancellation. This “over” reaction and emerging trend could be a barrier to the use of appropriate and justified radiologic procedures. To overcome patient concern, anxiety, refusal and cancellation, the referring physicians in paediatric clinics are well placed to directly explain the benefits and risks to those involved at the first instance.

4.3.4. Dialogue between pediatricians and parents – a regional experience

A survey was recently conducted in five South America countries to assess the perception of radiation risk from paediatric imaging procedures and the communication between parents (mothers) and medical practitioners; and to determine the range and use of existing tools and strategies. The practitioners’ awareness and knowledge of radiation exposure in procedures is low; their awareness of public health risk communication campaign and the need for communication with other health professionals is low; and the recording of procedure exposures in children is poor. For the mothers, the benefits and risks from and the exposure delivered in procedures were not provided and mothers were unaware of the need for or did maintain a record of procedure exposures. The challenges therefore include: awareness and knowledge; means to keep the doctors informed; public and doctors access to reliable information in a local language; communication with patients and families; maintenance of procedure exposures in medical record and by patients; and range of available tools.

It is encouraging noting the interest in, and involvement and participation of the key stakeholders in this survey, including the Societies of Paediatric and others. To overcome low awareness among decision makers and leaders, capacity building is urgently needed by the training of trainers, educators and leaders. Strategic partners from different sectors should be engaged to develop and disseminate evidence-based information and education tools and to create and promote dialogue between the end-users. The WHO plays a leadership and coordinating role by facilitating inter-sectorial stakeholder engagement and dialogue covering a range of emerging health issues.

4.3.5. The IAEA experience on communicating radiation risks and benefits in pediatric imaging

The International Atomic Energy Agency hosts a Radiation Protection of Patient’s website for health professionals; member states; patients; and public, including special groups, e.g. pregnant women and children. Resources are freely available covering questions and answers on common radiation protection issues, publications, standards, training material, presentations, and posters many of which
are available in translations. These resources are developed in collaboration with other stakeholders and in paediatric imaging the Image Gently Campaign. Link is provided to the Image Gently and other sites for more resources on paediatric imaging, radiation protection in children and radiation risk communication.

The key messages for paediatric imaging are the provision of concise, comforting and reassuring points focusing on: benefits, risks and procedure justification; discussion with doctors; consideration of non-ionizing procedures; and good record keeping. Knowing when and how to deliver a positive message stressing that medical radiation procedure is safe is important. Given the large variations in exposures for paediatric CT procedures across facilities, there is a need to educate providers and improve optimization.

The lessons learnt are to keep the messages simple when consensus with experts is required; and to evaluate feedback and impact to improve the content and use of these resources.

4.4 Message mapping

The goals for risk communication are to enhance knowledge and understanding; build trust and credibility; and encourage positive attitudes, behaviors and beliefs. Effective communication will ensure consistency between spokespersons, collaborators, advocates, i.e. “speaking with one voice”; ensure consistency across different communication outlets; and prevent omission of facts or misstatements. Success hinges on adequate preparation and messages targeted to a specific stakeholder group. These include identifying the key questions for a certain groups, mapping the key messages, testing and trialing, and applying graphics and visual aids as necessary. The evidence suggests that “simple” is best, i.e. keeping 9 words per message on the average. The challenge is how to make the message simple and appropriate.

The delegates were assigned into small groups to discuss and identify the practical tips and pitfalls on what to say, how to explain, and to develop tailored messages for a particular group of audience. The key messages are summarized in Table 1.
Table 1: A summary of the key messages on CT procedures for the different stakeholder groups.

<table>
<thead>
<tr>
<th>Key message 1</th>
<th>Key message 2</th>
<th>Key message 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groups A: Key messages for patients, parents and carers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT is a widely used and very effective test using x-rays</td>
<td>It is the best test to inform further actions, if any</td>
<td>The benefits greatly exceed the risks (for you)</td>
</tr>
<tr>
<td><strong>Groups B: Key messages for patients, parents and carers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT is more appropriate for your condition</td>
<td>The risk is small compared with the benefits</td>
<td>If it was my own child, I will go for it</td>
</tr>
<tr>
<td><strong>Group C: Key messages for referrers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wait, observe and consider alternatives (after reviewing the clinical findings, previous investigations and provisional diagnosis)</td>
<td>Assess the impact of procedures on management, consult guidelines and radiologist, consider dose</td>
<td>Provide information to parents by a simple way, involve parents in decision, inform consent</td>
</tr>
<tr>
<td><strong>Group D: Key messages for referrers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain proper clinical history and examination, including pregnancy and previous CT</td>
<td>Use guidelines, consider alternatives, write informative referral, and communicate with radiological practitioner if necessary</td>
<td>Risk communication to patients on the benefits and risks is indicated and includes broad estimation for dose and risk</td>
</tr>
<tr>
<td><strong>Group E: Key messages for radiological medical practitioners</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation risk from CT is low</td>
<td>Guidelines support the appropriate use of CT</td>
<td>Dose and risk are reduced by optimizing techniques</td>
</tr>
<tr>
<td><strong>Group F: Key messages for nurses and other health care providers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT is the best choice for this particular case</td>
<td>The risk is low and paediatric protocols minimize exposures</td>
<td>Inform the parents, compare risks and stay calm</td>
</tr>
<tr>
<td><strong>Group G: Key messages for administrators, policy makers, regulators and authorities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assign roles and responsibilities in the justification process</td>
<td>Ensure paediatric protocol is available and used</td>
<td>Audits of facilities must be performed</td>
</tr>
<tr>
<td><strong>Group H: Key messages for communicators, media and press</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There could be a life threatening situation</td>
<td>CT is preferred for detecting life threatening injuries</td>
<td>CT can be performed safely</td>
</tr>
</tbody>
</table>
4.5 Feedback on the communication tool

A draft tool on radiation risk communication in paediatric imaging was circulated prior to the Workshop. The feedback that was presented during the Workshop was based on the preliminary responses received and these include:

- The messages should be concise, clear, simple, understandable and user-friendly;
- One tool doesn’t fit all and the tailoring to a specific end-user group is needed;
- Avoid providing excessive detail or using technical terms;
- This resource when structured accordingly, could be included in the curricula of undergraduate and postgraduate programs for health professionals;
- An awareness of the factors affecting patients’ and carers’ comprehension of these messages at the point of care and the need for tailoring the content and delivery is needed;
- For the public, the information should start at a basic level, but more detailed information should be available through trustworthy websites; and
- To meet the needs of different settings, translation into a local language by employing expressions commonly used by the community and considering the cultural issues will improve uptake.

The practice of paediatric imaging should be “optimized” and the art of communication should be strengthened. The aim is to develop a tool to fill this gap. Effective communication is challenging and this tool should be an example of a good communication tool. Teamwork will deliver a better tool and lead to better outcome, e.g. clinical and scientific experts to assemble the facts; communication experts to fine-tune the message in co-operation with patient representatives; and graphic designers to enhance the interface.

4.6 Conclusion

The concluding and take home points are summarized as follows:

1. The importance of risk communication in paediatric imaging is stressed in view of the radiation sensitivity in children and their long life span for future manifestation of the biological effects;
2. Awareness of radiation risks and radiation doses in paediatric imaging procedures amongst referrers, patients and the public is low;
3. It is important to tailor the messages to specific stakeholders - message mapping is useful;
4. Professional experts contribute by crafting and tailoring evidence-based key messages and communication experts enhance these by fine-tuning the language and the delivery to meet the needs of different end-users;
5. The patients and carers must be involved and represented in all processes, preferably at an early
6. Risk communication in paediatric imaging is a team action. In practice, this will often involve the front line professional, i.e. the radiographer. The contribution from a medical physicist is needed for higher risk situations; and

7. A risk communication tool is important and useful. This should be used for education. The targeted messages should be clear and concise.

5. **Deliverables and the next step**

The deliverables include a Workshop Report and a communication package consisting of advocacy messages and a radiation risk communication tool for health professionals, patients, family and the public. These resources provide the stakeholders with evidence-based information and trustworthy advice to improve their understanding and communication of radiation risks in paediatric imaging. The next steps are to inform the stakeholders of the availability of this communication tool, to disseminate and advocate its use in practice.
6.  Appendix 1: List of participants

Radiation Risk Communication in Paediatric Imaging Workshop
Global Initiative on Radiation Safety in Healthcare Settings
2\textsuperscript{nd} December 2012, Bonn, Germany

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7. Appendix 2: Workshop Agenda

WORKSHOP AGENDA

**09:00 Opening session**
Welcome addresses:
Presentation of facilitator/s, chairpersons and meeting rapporteurs

Chairperson/s:

Meeting co-rapporteurs:

Co-facilitators morning sessions:

Co-facilitators afternoon sessions:

Scope and purpose of the workshop, working procedures
Draft tool evaluation form (distribution and explanation)

**09:30 Setting the scene: numbers, facts, trends, issues**
Health risks of radiation exposure early in life
Paediatric imaging today - making the right choice
Paediatric imaging today - procedures, doses, child-sizing settings
A culture shift to improve practice - radiation protection culture
Q&A, discussion

**10:30 Coffee break**

**11:00 Creating a dialogue in pediatric health care: opportunities and challenges** (Panel discussion)
Risk communication in public health
Communication between referrers and providers / radiological practitioners
Role of family doctors
Role of other health care providers
Patients / parents information, informed consent vs. informed decision-making process?
Q&A, discussion

Preparation for the afternoon breakout session: establishing groups, explaining/distributing tasks, nominating rapporteurs.

Proposed WG Rapporteurs:

**12:30 Lunch**
13:30 Plenary + breakout sessions (2 hours - testing the radiation risk communication tool)

1) **Buzz session** small groups discussion  
   Gaya Gamhewage (WHO)

2) **Building on lessons learned**: 4 case studies, 45 minutes to discuss and identify good practices, lessons learned

   1. UK experience: the experience of the RCR in the dialogue between radiologists and referrers, dialogue with patients and parents (role of radiologists as gatekeepers, tools to communicate radiation risks and benefits) 
      Denis Remedios (RCR, UK)

   2. JAPAN experience: dialogue between scientists and the public; dialogue between paediatric radiologists and referrers & parents. To discuss whether / how Fukushima Daiichi nuclear accident had implications perception & communication of risks and benefits in paediatric imaging? 
      Keiichi Akahane (NIRS/ Chiba)
      Osamu Miyazaki (National Children’s Hospital, Tokyo)

   3. REGIONAL experience: the perception & communication of radiation risks – the dialogue between/with pediatricians, parents, public, tools, methods, gaps, needs 
      Lilian Corra (International Society of Doctors for the Environment, ISDE)

   4. GLOBAL experience: the IAEA experience on communicating radiation risks and benefits in pediatric imaging (RPoP website; messages for parents, public, referrers; cooperation with Image Gently) 
      Madan Rehani (International Atomic Energy Agency, IAEA and ICRP C3)

3) **Message mapping exercise to communicate radiation risks in paediatric imaging** 
   Vince Holahan (NRC), Pek-Lan Kong, John Parrish-Sprowl and co-facilitators

   50 minutes to identify / discuss practical tips, traps, pitfalls: what to say, how to explain it, tailoring messages to a target audience.

**15:30 Group photo - Coffee Break**
Draft tool evaluation forms (collection of hardcopies)

**16:00 Reports of the breakout groups rapporteurs**

To discuss the results of the breakout sessions from the perspective of:
- Patients & parents;
- Referrers (pediatricians, general practitioners, family doctors);
- Radiological practitioners (radiologists, radiographers, medical physicists);
- Other health care providers;
- Educational institutions, medical students;
- Competent authorities, health policy makers;
- Scientists, researchers;
- Communication experts; and
- Other/s?

**Final discussion**

Summary of Panel conclusions
Outcome of the breakout sessions
Feedback on the radiation risk communication tool (short briefing on evaluation forms)
Next steps, take home messages

**16:50 Closing remarks**

**17:00 End of Workshop**
## Appendix 3: A list of useful links

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website</th>
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<tr>
<td>Bundesamt für Strahlenschutz, Germany (BfS)</td>
<td><a href="http://www.bfs.de">www.bfs.de</a></td>
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<td>Department of Radiation Protection, Luxembourg</td>
<td><a href="http://www.ms.etat.lu">www.ms.etat.lu</a></td>
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<td>European Commission (EC)</td>
<td><a href="http://ec.europa.eu">ec.europa.eu</a></td>
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<td>European Federation of Radiographer Societies (EFERS)</td>
<td><a href="http://www.efrs.eu">www.efrs.eu</a></td>
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<td>Federal Agency for Nuclear Control, Belgium (FANC)</td>
<td><a href="http://www.fanc.fgov.be">www.fanc.fgov.be</a></td>
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<td>Image Gently Campaign - Alliance for Radiation Safety in Pediatric Imaging</td>
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<td>International Atomic Energy Agency (IAEA)</td>
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<td>International Commission on Radiological Protection (ICRP)</td>
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<td>International Organization for Medical Physics (IOMP)</td>
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<td>International Radiation Protection Association (IRPA)</td>
<td><a href="http://www.irpa.net">www.irpa.net</a></td>
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<td>International Radiology Quality Network (IRQN)</td>
<td><a href="http://www.irqn.org">www.irqn.org</a></td>
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<td>International Society of Radiology (ISR)</td>
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<td>International Society of Radiographers &amp; Radiological Technologists (ISRRRT)</td>
<td><a href="http://www.isrrt.org">www.isrrt.org</a></td>
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<td>National Institute of Radiological Sciences, Japan (NIRS)</td>
<td><a href="http://www.nirs.go.jp/">www.nirs.go.jp</a></td>
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<tr>
<td>National Nuclear Energy Commission, Brazil</td>
<td><a href="http://www.cnen.gov.br">www.cnen.gov.br</a></td>
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<td>Norwegian Radiation Protection Authority (NRPA)</td>
<td><a href="http://www.nrpa.no">www.nrpa.no</a></td>
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<td>Nuclear Regulatory Authority, Argentina</td>
<td><a href="http://www.arn.gov.ar">www.arn.gov.ar</a></td>
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<tr>
<td>Pan American Health Organization (PAHO)</td>
<td><a href="http://new.paho.org">new.paho.org</a></td>
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<td>UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)</td>
<td><a href="http://www.unscear.org">www.unscear.org</a></td>
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<tr>
<td>World Health Organization (WHO)</td>
<td><a href="http://www.who.org">www.who.org</a></td>
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9. **Appendix 4: A list of abbreviations**

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<tr>
<th>Abbreviation</th>
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<tr>
<td>AAPM</td>
<td>American Association of Physicists in Medicine</td>
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<td>ACR</td>
<td>American College of Radiology</td>
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<tr>
<td>ACS</td>
<td>American cancer Society</td>
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<td>ALARA</td>
<td>As low as reasonably achievable</td>
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<td>AMRO</td>
<td>WHO Regional Office for the Americas</td>
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<td>AOSR</td>
<td>Asian &amp; Oceanian Society of Radiology</td>
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<td>ARPANSA</td>
<td>Australian Radiation Protection and Nuclear Safety Agency</td>
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<td>ASN</td>
<td>Autorité de Sureté Nucléaire (France)</td>
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<td>ASTRO</td>
<td>American Society for Therapeutic Radiology and Oncology</td>
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<tr>
<td>BfS</td>
<td>Bundesamt für Strahlenschutz (Federal Radiation Protection Agency, Germany)</td>
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<td>BSS</td>
<td>Basic Safety Standards</td>
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<td>CIRSE</td>
<td>Cardiovascular and Interventional Radiological Society of Europe</td>
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<td>CRPPH</td>
<td>Committee on Radiation Protection and Public Health</td>
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<td>CT</td>
<td>Computed Tomography</td>
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<td>DR</td>
<td>Digital Radiology</td>
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<td>DR TREN</td>
<td>Directorate General for Energy and Transport</td>
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<td>DRLs</td>
<td>Diagnostic Reference Levels</td>
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<td>EMAN</td>
<td>European Medical ALARA Network</td>
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<td>Federal Agency for Nuclear Control (Belgium)</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>FORO</td>
<td>Ibero-American Forum of Radiological and Nuclear Regulatory Agencies</td>
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<td>GMP</td>
<td>Good Medical Practice</td>
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<td>GI</td>
<td>Global Initiative</td>
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<tr>
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<td>ISO</td>
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<td>Information System on Occupational Exposure</td>
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<td>ISR</td>
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<tr>
<td>PACT</td>
<td>Program of Action for Cancer Therapy</td>
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