Implementation of international basic safety standards (BSS) for the use of radiological medical imaging devices
International Radiation Basic Safety Standards (BSS)

- Global benchmark for radiation safety, cosponsored by 8 international organizations.
- The safety requirements in new International BSS and in the new EURATOM BSS are consistent.
- In both - the new international and EURATOM BSS - the safety requirements on medical exposures have been substantially expanded.
- A key challenge today: to implement the new BSS in medical uses of radiation.
All the BSS requirements for medical exposures are relevant for the use of medical devices

- R. 34: **Authorizations** to relevant parties to assume roles/ responsibilities
- R. 35: **Education, training and competence** of health professionals.
- R. 36: Appropriate **referral, protection & safety, information** to patients.
- R. 37: All medical exposures shall be **JUSTIFIED**
- R.38: Protection & safety shall be **OPTIMIZED** for each medical exposure
- R.39: Protection of **pregnant** and **breast-feeding** patients
- R.40: **Release of patients** after radionuclide therapy
- R.41: Prevention of **unintended and accidental medical exposures**
- R.41: Radiological **reviews** performed and **records** maintained
BSS and the optimization of protection & safety for the use of medical devices

- **Design** considerations (medical radiological equipment and software)

- **Operational** considerations (cooperation between rad. medical practitioner, medical physicist and rad. technologist to ensure that appropriate equipment/software, and appropriate techniques/parameters are used)

- **Particular considerations** (children, research, health screening, pregnancy, breastfeeding, high-dose procedures).

- **Patient dosimetry** performed and documented and diagnostic reference levels (**DRLs**) established and periodically reviewed

- **Quality assurance** by, or under the supervision of a medical physicist (acceptance of the equipment, commissioning prior use, maintenance, installation of new software, verifications, calibrations, records, …)
Some challenges for the implementation of the BSS radiation safety requirements

- **Low level of awareness** about radiation doses and risks among health professionals, and about their roles and responsibilities in radiation safety of medical devices.

- **Lack of integration** of radiation safety into healthcare policies, medical device regulations and health technology assessments (HTAs).

- **Limited dialogue/cooperation** between health authorities, medical device regulators and radiation protection regulators.

- **Huge disparities in access** to health services, technologies, human and financial resources between (and within) regions/countries.
Joining efforts to engage the health sector in the implementation of BSS

Bonn Call for Action

10 actions to improve radiation protection in medicine

jointly published by the IAEA and WHO

1. Enhancing implementation of justification of procedures
2. Enhancing implementation of optimization of protection and safety
3. Strengthening manufacturers’ contribution to radiation safety
4. Strengthening RP education and training of health professionals
5. Shaping & promoting a strategic research agenda for RP in medicine
6. Improving data collection on radiation exposures of patients and workers
7. Improving primary prevention of incidents and adverse events
8. Strengthening radiation safety culture in health care
9. Fostering an improved radiation benefit-risk-dialogue
10. Strengthening the implementation of safety requirements (BSS) globally

International Conference on Radiation Protection in Medicine - Achieving Change in Practice

- To be held at the IAEA HQ, Vienna, Austria, 11–15 December 2017
- Organized by the IAEA
- Co-sponsored by WHO and PAHO

http://www.who.int/ionizing_radiation/about/med_exposure/en
https://rop.iaea.org/RPOP/RPopP/Content/News/bonn-call-for-action-print-position-statement.htm
Implementation of international basic safety standards (BSS) for the use of radiological medical imaging devices

The role of the International Organization for Medical Physics

Prof. Dr. Magdalena Stoeva

Chair IOMP Medical Physics World Board
Edit In-Chief IOMP MPW
Deputy Editor Health & Technology
The International Organization for Medical Physics

- WHO NGO
- Founded in 1963
- Members:
  - 86 National Member Organizations
  - 6 Regional Organizations
  - Corporate members
- Representing ca. 25,000 Medical physicists worldwide
IOMP’s Objectives

- Organize international cooperation in medical physics and allied subjects
- Contribute to the advancement of medical physics in all its aspects, especially in developing countries
- Encourage and advise on the formation of national organizations of medical physics in those countries which lack such organizations.
How to Interact with IOMP

- Become a member of any of the Committees of IOMP, usually at the start of the term every 3 years and through Chair of one of the Committees.
- Get elected to the management team of IOMP. Next election is at the end 2017 for the term 2018-2021.
- Be aware about IOMP awards (Marie Skłodowska-Curie Award, Harold Johns Medal, John Mallard Award, IDMP Award, IUPAP Young Scientist Award in Medical Physics).
- Implement actions in member countries through existing committees.
- Avail travel support for participation in WCs and ICMPs.

Submit a manuscript to the Medical Physics International (MPI) journal.

Contribute articles to eMPW on topics of wider interest.

Promote your products in medical physics field through IDMP website and publications and become corporate member of IDMP.*

Contribute to the IDMP Women Subcommittee.

Take advantage of sponsorship/funding for organizing scientific, educational and professional meetings.

Organize or join an event to celebrate the International Day of Medical Physics on November 7. www.iomp.org/idmp

Participate in World Congresses (WCs) held every 3 years and International Conference on Medical Physics (ICMPs) in between two WCs.
IOMP Promoting Safety via Education

IOMP Publications

Medical Physics World
Medical Physics International
Physics in Medicine and Biology
Physiological Measurement
Medical Physics
Journal of Applied Clinical Medical Physics
Health & Technology
Medical Physics and Biomedical Engineering Series
IOMP Promoting Safety via Education

- **IOMP Educational Initiatives**
  
  *Education in Medical Physics – Key to Success*
  Workshops  
  IOMP School – 42 mini-simposia  
  IOMP libraries program – 36 libraries, 27 countries  
  EMITEL encyclopedia of medical physics – ca. 3200 terms  
  Multi-lingual dictionary of terms – 29 languages

- **IOMP Educational Centers/Programs**

  Collaboration with IAEA, UNESCO, ICTP
IOMP Initiatives on Regional and National Levels

- **IOMP NMOs**
  86 National Member Organizations

- **IOMP ROs**
  6 Regional Organizations
  EFOMP. AFOMP. SEAFOMP. MEFOMP, ALFIM, FAMPO
IOMP Initiatives on Regional and National Levels

IOMP: Global Organization with 6 Federations + 86 National societies

IOMP: 86 countries ~24,000 members

USA+Canada 8300
EFOMP 8400
ALFIM 800
FAMPO 400
MEFOMP 600
SEAFOMP 500
AFOMP 4600

Fig. 2. Approximate number of medical physicists in the world in 2016 – IOMP data per Federation/Regional Organizations.
IOMP Initiatives on Regional and National Levels

- IOMP Regional Coordination Board
IOMP Initiatives Related to Bonn Call for Action

● IOMP collaborates with IAEA

● **International Conference on Radiation Protection in Medicine: Achieving Change in Practice, 11-15 December 2017, IAEA HQ, Vienna Austria**

● **Review actions taken and results achieved in radiation protection in medicine since the 2012 ICRPM, Bonn, Germany**

● **Focused on the actions proposed in the Bonn Call for Action**
Strong Demand for Medical Physicists

“…by 2035, the global number of newly trained medical physicists will be of the order of: 17,200 (for High income countries); 12,500 (for Upper-middle-income countries); 7,200 (for Lower-middle-income countries); 2,400 (for Low-income counties). Adding the needs of Medical Imaging will result in approximately tripling the number of medical physicists in the coming two decades (2015-2035).”

A concerted effort of the IOMP, its NMOs and Ros, together with international organizations, WHO and IAEA, is essential to implement the recommendations of the BSS, in which the role, responsibilities and qualification of medical physicists are defined.

IOMP could also provide guidance and support to member organizations on development of formal infrastructure for education and training, establishment of professional certification, and planning of medical physics manpower requirements.
THANK YOU!
Implementation of international basic safety standards (BSS) for the use of radiological medical imaging devices

A Radiographers Perspective

A Stewart Whitley

Treasurer, ISRRRT
ISRRT’s Identity

- Was founded in 1962
- Has 94 Member Societies
- Has over 500,000 Society members and
- Is in excess of 5000 Associate Members.
- Has Officially recognized as Non-Government Organisation by the WHO.
- Is the only organization representing all disciplines of Radiographers and Radiological Technologists internationally
ISRRT – what we do (1)

- Annual workshops in middle to low income countries – in corporation with various agencies
- WHO initiatives, surveys and handbooks on QA
- Disseminates information from IAEA and developments occurring in member countries
- Promotion of best practices
- Promoting Research
- Collaborative “Dosewise Radiographer of the year” competition with Philips Healthcare
- Promoting awareness of the public through celebrating World Radiography Day – 8th Nov
ISRRT – what we do (2)

- ISRRT World Congresses – Travel Fund & relevant subjects
- Image Gently programme
- Sends experts to study the system in developing nations and recommends action plans
- Provides advice to national societies & governmental bodies
- Provides text books / printed materials where necessary
- Produces Newsletter three yearly - translation into Spanish & French - articles on radiation protection
- Disseminates information on developments occurring in member countries
Implementation of international basic safety standards (BSS)

Key points

- Diagnostic equipment based in Government funded hospitals and health clinics including national screening programmes
- Private sector
- Image Guided radiotherapy (IGRT)
- Imaging outside the Diagnostic Imaging Dept.:-
  - Urology
  - Orthopaedics
  - Vascular
  - Gastroenterology
  - Others – for interventional guidance
  - Breast clinics
Implementation of international basic safety standards (BSS)

ISRRT Focus

- Bonn Call for Action
- Justification
- Optimisation
- Diagnostic Reference Levels
- Referral Guidelines
- Protocols and Procedures to guide Justification and Authorisation of Medical Exposures
# ISRRT focus on Bonn Call for Action 1

## Justification

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action 1: Enhance the implementation of the principle of justification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Introduce and apply the 3A’s (appropriateness, awareness, and audit), which are seen as tools that are likely to facilitate and enhance justification in practice;</td>
<td>(a) IAEA workshop justification Asia and Pacific region</td>
<td>(b) Promote and fund justification workshops in Developing countries.</td>
</tr>
<tr>
<td>b) Develop harmonized evidenced-based criteria to strengthen the appropriateness of clinical imaging, including diagnostic nuclear medicine and non-ionizing radiation procedures, and involve all stakeholders in this development;</td>
<td>(b) Currently (2014) funding research in the ISRRT radiography community worldwide on the theme “The Role of the Radiographer in the Justification of Medical Exposure”</td>
<td>(b) Produce a policy/guidance document to support radiographer justification.</td>
</tr>
<tr>
<td>c) Implement clinical imaging referral guidelines globally, keeping local and regional variations in mind, and ensure regular updating, sustainability and availability of these guidelines;</td>
<td>(c) Stakeholder in the development of the WHO, ICRN Referral Guidelines Project</td>
<td>(b) Do a review of the literature on the theme of justification and evidenced-based imaging procedures</td>
</tr>
<tr>
<td>d) Strengthen the application of clinical audit in relation to justification, ensuring that justification becomes an effective, transparent and accountable part of normal radiological practice;</td>
<td>(d) ISRRT involvement in IAEA justification workshops and forthcoming HERCA Working Group on Medical Applications</td>
<td>(c) Produce and support the development of audit guidelines, especially around patient dosimetry</td>
</tr>
<tr>
<td>e) Introduce information technology solutions, such as decision support tools in clinical imaging, and ensure that these are available and freely accessible at the point-of-care;</td>
<td>(e) Add a section on the website to promote and post information justification and the contribution of the radiographer</td>
<td>(c) Assist in the adaptation and use of referral guidelines which have been disseminated by WHO &amp; ICRN to the 6 WHO regions</td>
</tr>
<tr>
<td>f) Further develop criteria for justification of health screening programmes for asymptomatic populations (e.g. mammography screening) and for medical imaging of asymptomatic individuals who are not participating in approved health screening programmes (e.g. use of CT for individual health surveillance).</td>
<td>(f) Develop decision tool on justification role of radiographer in the healthcare team; house on ISRRT website</td>
<td>Continue international corporation with IAEA, WHO, ICRQNS and other Professional bodies</td>
</tr>
</tbody>
</table>
ISRRT Justification and Authorisation of Medical Exposures
Flow Chart
Radiographer/Radiological Technologist
(Medical Radiation Technologist) involvement
A typical process following receipt of a request for exposure
to ionizing radiation

- Check medical records for duplicate request
  - NO
  - Yes
  - Does the benefit outweigh the risks?
    - NO
    - YES
    - Does the completed request comply with local protocols, i.e., clinical information align with the request and policies, request form signed?
      - NO
      - YES
      - Is the request appropriate — will the outcome affect the patient’s management?
        - NO
        - YES
        - Is there an alternative modality?
          - NO
          - YES
          - Modify examination — reason added to the patient’s notes

- Radiological practitioner (radiologist or delegated radiographer/technologist) resolves request with the referrer
  - Modify — Cancel — Continue
  - Cancel the examination reason added to the patient’s notes
  - Continue with the examination

Note: Referrer = referring medical practitioner.
Radiological medical practitioner = radiologist or approved medical radiation technologist (radiographer/technologist) acting under agreed protocols.
General Principles and working examples

When authorising and justifying an exposure, there are a number of considerations for healthcare professionals to take into account. For example will the exposure contribute to or change the individual’s healthcare management, what previous imaging is available and are there alternative techniques that will answer the question but do not involve ionizing radiation?

Justification is an intellectual activity and is the primary role of the radiological medical practitioner. When justifying an exposure, appropriate weight must be given to matters outlined in the table below.
General Principles and working examples – Things to consider

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| a | The specific objectives of the exposure | What is to be gained by carrying out the exposure?  
How may the outcome affect the management of the patient? |
| b | The characteristics of the individual involved | Such as previous imaging, medical history, age or pregnancy status of the patient, body habitus. |
| c | The potential diagnostic or therapeutic benefits to the individual from the exposure | What is the expected benefit of the medical exposure?  
Will the patient’s treatment be altered? |
<p>| d | The detriment the exposure may cause | What is the possible detriment from the associated radiation dose? |
| e | The efficacy, benefits and risk of alternative techniques having the same objective but involving no or less exposure to ionising radiation | What other alternative imaging modalities are available that could answer the diagnostic question but involve less or no radiation? |</p>
<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Action 2: Enhance the implementation of the principle of optimization of</td>
<td><strong>(Specific sub-actions identified highlighted)</strong></td>
<td>*(a) Promote and fund workshops in Developing countries which focus on Optimisation and DRLs. *(a &amp; d) Fund DRL research to establish the range of dose being applied for specific examinations and dose recording *(b) Produce a policy/guidance document to support radiographer DRLs. Have this document in English, French and Spanish if feasible Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies</td>
</tr>
<tr>
<td>protection and safety**</td>
<td>*(a) ISRRT have contributed to a number of IAEA &amp; WHO conferences and initiatives on optimisation. *(b) ISRRT has funded a number projects worldwide in developing countries which address this action *(c) has produced in the past a QA handbook specific to film/chemistry based systems *(d) WHO and IAEA SMART CARD participated Joint statement for support and development of project *(e) Workshop in Seoul October 2016 at World Congress</td>
<td></td>
</tr>
<tr>
<td>a) Ensure establishment, use of, and regular update of diagnostic reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>levels for radiological procedures, including interventional procedures,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in particular for children;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Strengthen the establishment of quality assurance programmes for medical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>exposures, as part of the application of comprehensive quality management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Implement harmonized criteria for release of patients after radionuclide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>therapy, and develop further detailed guidance as necessary;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Develop and apply technological solutions for patient exposure records,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>harmonise the dose data formats provided by imaging equipment, and increase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>utilization of electronic health records.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISRRT focus on Bonn Call for Action 3

#### Safety regime

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action 3: Strengthen manufacturers’ role in contributing to the overall safety regime</strong></td>
<td><strong>(Specific sub-actions identified highlighted)</strong></td>
<td><strong>(f) Foster new and existing contacts with manufacturers</strong></td>
</tr>
<tr>
<td>a) Ensure improved safety of medical devices by enhancing the radiation protection features in the design of both physical equipment and software and to make these available as default features rather than optional extra features;</td>
<td>This is an area which has not involved ISRRT on a formal basis.</td>
<td>Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies in developing links with manufacturers.</td>
</tr>
<tr>
<td>b) Support development of technical solutions for reduction of exposure of patients, while maintaining clinical outcome, as well as of health workers;</td>
<td>However senior officers have established contacts at senior level with a number of manufacturers and are involved to a certain degree in assessing developments.</td>
<td></td>
</tr>
<tr>
<td>c) Enhance the provision of tools and support in order to give training to users that is specific to the particular medical devices, taking into account radiation protection and safety aspects;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Reinforce the conformance to applicable standards of equipment with regard to performance, safety and dose parameters;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Address the special needs of health care settings with limited infrastructure, such as sustainability and performance of equipment, whether new or refurbished;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Strengthen cooperation and communication between manufacturers and other stakeholders, such as professionals and professional societies;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Support usage of platforms for interaction between manufacturers and health and regulation authorities and their representative organizations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISRRT focus on Bonn Call for Action 4: Education and Training

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action 4: Strengthen radiation protection education and training of health professionals</strong></td>
<td>(Specific sub-actions identified highlighted)</td>
<td>(Specific sub-actions identified highlighted)</td>
</tr>
<tr>
<td>a) Prioritize radiation protection education and training for health professionals globally, targeting professionals using radiation in all medical and dental areas;</td>
<td>(a) ISRRT has not been directly involved in this action apart from partnering with WHO, IAEA, PAHO and other agencies</td>
<td>(a&amp;d) Produce a new policy / guidance document to support development of simple training documents that can be handed out by radiographers in English, French and Spanish.</td>
</tr>
<tr>
<td>b) Further develop the use of newer platforms such as specific training applications on the Internet for reaching larger groups for training purposes;</td>
<td><strong>d) WHO Western Pacific Regional Office Representative</strong> on issues related to universal health care and international health regulations</td>
<td>Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies in developing links with health professionals and updating literature.</td>
</tr>
<tr>
<td>c) Integrate radiation protection into the curriculum of medical and dental schools, ensuring the establishment of a core competency in these areas;</td>
<td><strong>e) WHO Second Global Forum on Medical Devices in developing nations</strong></td>
<td></td>
</tr>
<tr>
<td>d) Strengthen collaboration in relation to education and training among education providers in health care settings with limited infrastructure, as well as among these providers and international organizations and professional societies;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Pay particular attention to the training of health professionals in situations of implementing new technology.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ISRRT focus on Bonn Call for Action 5

#### Research

**Bonn Actions**

<table>
<thead>
<tr>
<th>Action 5: Shape and promote a strategic research agenda for radiation protection in medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Explore the re-balancing of radiation research budgets in recognition of the fact that an overwhelming percentage of human exposure to man-made sources is medical;</td>
</tr>
<tr>
<td>b) Strengthen investigations in low-dose health effects and radiological risks from external and internal exposures, especially in children and pregnant women, with an aim to reduce uncertainties in risk estimates at low doses;</td>
</tr>
<tr>
<td>c) Study the occurrence of and mechanisms for individual differences in radiosensitivity and hyper-sensitivity to ionizing radiation, and their potential impact on the radiation protection system and practices;</td>
</tr>
<tr>
<td>d) Explore the possibilities of identifying biological markers specific to ionizing radiation;</td>
</tr>
<tr>
<td>e) Advance research in specialized areas of radiation effects, such as characterization of deterministic health effects, cardiovascular effects, and post-accident treatment of over-exposed individuals;</td>
</tr>
<tr>
<td>f) Promote research to improve methods for organ dose assessment, including patient dosimetry when using unsealed radioactive sources, as well as external beam small-field dosimetry.</td>
</tr>
</tbody>
</table>

**Current Actions**

(Specific sub-actions identified highlighted)

<table>
<thead>
<tr>
<th>ISRRT has an annual research budget with the latest addressing the Role of the Radiographer in the Justification of Medical Exposure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISRRT needs to explore how it embraces all of the sub actions</td>
</tr>
</tbody>
</table>

**Suggested Actions still required**

(Specific sub-actions identified highlighted)

<table>
<thead>
<tr>
<th>(e) Continue ISRRT funded targeted annual research projects into radiation protection in medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>(f) Work with research bodies and target research into one or more of the specific sub-actions.</td>
</tr>
<tr>
<td>(f) Consider partnering with MELOD1 – the Multidisciplinary European Low Dose Initiative or other similar organisations</td>
</tr>
<tr>
<td>(e) Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies in developing links with health professionals in advancing research</td>
</tr>
</tbody>
</table>
### ISRRT focus on Bonn Call for Action 6

**Global Information**

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
</table>
| **Action 6 – Increase availability of improved global information on medical exposures and occupational exposures in medicine**  
  a) Increase collection of dose data and trends on medical exposures globally, and especially in low- and middle-income countries, by fostering international co-operation;  
  b) Improve data collection on occupational exposures on medicine globally, also focussing on corresponding radiation protection measures taken in practice;  
  c) Make the data available as a tool for quality management and for trend analysis, decision making and resource allocation  | **ISRRT is a partner of the Alliance for Radiation Safety in Paediatric Imaging and associated with various campaigns (Image Gently, Image Wisely, Step Lightly and Image Gently for Dentistry) and with European member organisations linked through EFRS to the EuroSafe Imaging Strategy.**  
  a) participate in Smart Card project IAEA and WHO  | (a)Partner or lead an initiative for collection of dose data in developing countries or in a specific Region – perhaps as a pilot.  
  (a)Partner with the Alliance for radiation safety in Paediatric Imaging  
  (a)Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies in supporting and developing research projects |
<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action 7: Improve prevention of medical radiation incidents and accidents</strong></td>
<td>(Specific sub-actions identified highlighted)</td>
<td>(Specific sub-actions identified highlighted)</td>
</tr>
<tr>
<td>a) Implement and support voluntary educational safety reporting systems for the purpose of learning from the return of experience of safety related events in medical uses of radiation</td>
<td>Currently no direct action in terms of the sub-actions</td>
<td>(a &amp; d) Produce a policy/guidance document to support development of reporting system and risk analysis tool kit.</td>
</tr>
<tr>
<td>b) Harmonize taxonomy in relation to medical radiation incidents and accidents, as well as related communication tools such as severity scales, and consider harmonization with safety taxonomy in other medical areas;</td>
<td></td>
<td>(c) Continue to promote Saphron (the Reporting tool from WHO on safety reporting for radiation therapy) by having a permanent link on web</td>
</tr>
<tr>
<td>c) Work towards inclusion of all modalities of medical usage of ionizing radiation in voluntary safety reporting, with an emphasis on brachytherapy, interventional radiology, and therapeutic nuclear medicine in addition to external beam radiotherapy;</td>
<td></td>
<td>Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies in developing tools and mechanisms to improve prevention of incidents and accidents.</td>
</tr>
<tr>
<td>d) Implement prospective risk analysis methods to enhance safety in clinical practice;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Ensure prioritization of independent verification of safety at critical steps, as an essential component of safety measures in medical uses of radiation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**ISRRT focus on Bonn Call for Action 8**

**Safety culture**

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action 8: Strengthen radiation safety culture in health care</strong></td>
<td>(Specific sub-actions identified highlighted)</td>
<td>(a,g)&amp;g Produce a policy document that addresses patient safety, closer co-operation on safety protection and the enhancement of information exchange among peers. (b) Improve the links with the ISRP to improve cooperation and joint projects (c) Promote Image Gently, Image Wisely, Step Lightly and Image Gently for Dentistry campaigns and all campaigns on safety including the Patient Safety Quality in Medical Imaging: The Radiological Technologist’s Role white paper of the ASRT as an example.</td>
</tr>
<tr>
<td>a) Establish patient safety as a strategic priority in medical uses of ionizing radiation, and recognize leadership as a critical element of strengthening radiation safety culture;</td>
<td>(a) ISRRT has funded a number of projects worldwide in developing countries which address radiation safety but this has been focused on the role of the radiographer. (b) Links with the ISRP are established but needs to be fostered to improve cooperation and joint projects.</td>
<td></td>
</tr>
<tr>
<td>b) Foster closer co-operation between radiation regulatory authorities, health authorities and professional societies;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Foster closer co-operation on radiation protection between different disciplines of medical radiation applications as well as between different areas of radiation protection overall, including professional societies and patient associations;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Learn about best practices for instilling a safety culture from other sources, such as the nuclear power industry and the aviation industry;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Support integration of radiation protection aspects in health technology assessment;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Work towards recognition of medical physics as an independent profession in health care, with radiation protection responsibilities;</td>
<td>(g) Participate represent global technologist voice in WHO meeting with other international organization and governmental organizations to mobilize health sector towards safe and effective use of radiation in medicine.</td>
<td></td>
</tr>
<tr>
<td>g) Enhance information exchange among peers on radiation protection and safety-related issues, utilizing advances in information technology</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ISRRT focus on Bonn Call for Action 10

### Global outreach

<table>
<thead>
<tr>
<th>Bonn Actions</th>
<th>Current Actions</th>
<th>Suggested Actions still required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action 10: Strengthen the implementation of safety requirements globally</td>
<td>(Specific sub-actions identified highlighted)</td>
<td>(Specific sub-actions identified highlighted)</td>
</tr>
<tr>
<td>a) Develop practical guidance to provide for the implementation of the</td>
<td>(a) Directly involved at International level with Draft writing group for Safety</td>
<td>(a) Produce a policy document which supports and influences the implementation of the BSS</td>
</tr>
<tr>
<td>International Basic Safety Standards in health care globally;</td>
<td>Guide supplement to the Basic Safety Standard’s: Chapter 5 (DS399)</td>
<td>(b) Promote the publication written articles in “News and Views” which addresses this issue.</td>
</tr>
<tr>
<td>b) Further the establishment of sufficient legislative and administrative</td>
<td>Nuclear medicine section revision meeting Vienna Austria and Chapter one and</td>
<td>(a) Continue as an organisation to respond to requests for comments and feedback for various</td>
</tr>
<tr>
<td>framework for the protection of patients, workers and the public at</td>
<td>two of the Radiation Safety Guide in Medical Uses of Ionizing Radiation in Vienna</td>
<td>draft documents and participation in relevant international meetings – using feedback from</td>
</tr>
<tr>
<td>national level, including enforcing requirements for radiation</td>
<td>IAEA Aug 19-23, 2013</td>
<td>experts in the field.</td>
</tr>
<tr>
<td>protection education and training of health professionals, and</td>
<td>(b) May 2013 IAEA RS-G13 Safety Series Drafting group for the update of Medical</td>
<td>(b) Continue international cooperation with IAEA, WHO, ICRQS and other Professional bodies and</td>
</tr>
<tr>
<td>performing on-site inspections to identify deficits in the application</td>
<td>Exposure in Diagnostic and Interventional Radiology to accompany BSS</td>
<td>particular individual countries in furthering the establishment of legislative and administrative</td>
</tr>
<tr>
<td>of the requirements of this framework.</td>
<td>a) June 2014 Provide Feedback as stakeholder on IAEA Draft Safety guide DS453</td>
<td>frameworks.</td>
</tr>
<tr>
<td></td>
<td>on Occupational Radiation Protection</td>
<td></td>
</tr>
</tbody>
</table>
Implementation of international basic safety standards (BSS) for the use of radiological medical imaging devices.
Implementation of international basic safety standards (BSS) for the use of radiological medical imaging devices

From the perspective of a radiology NGO

Miriam N. Mikhail, M.D.
Nikita Consul, B.S.
Affiliated with WHO
   - RAD-AID can help countries as part of a formal collaborative workplan with the WHO, through MoH counterparts, and with other partners

Onsite programs in 25 countries

Founded 2008

>6100 volunteers from 100 countries (team approach)

53 university-based chapters

Annual global health and radiology conference at PAHO
Mission: in-country radiology improvement including implementation of BSS

Where We Work: RAD-AID’s Global Outreach
RAD-AID has programs in 25 countries, designed to assist the implementation, improvement and optimization of radiology and radiation therapy. Sign up for e-news alerts about events and international opportunities to serve on an outreach team.
How can we help support the BSS?
Example in-country programs

Rad-AID South Africa

RAD-AID is launching a new program for radiology development in South Africa, which will be spearheaded by the RAD-AID University of Maryland Chapter. The program began in early 2016 with a Radiology-Readiness assessment performed at multiple health institutions in the Cape Town region of South Africa. Thorough assessments were completed in the Western Cape with a future trip planned to being work with colleagues in the Eastern Cape. Results will facilitate the development of radiology, radiation safety measures, quality-optimization, and information technologies for imaging in South Africa.

Quality and dose optimization (including methods for dose reduction)

Radiation Safety

World Health Organization
Supporting actions 1 and 2 through regional campaigns: Justification and Optimization

AFROSAFE
Image Gently
Image Wisely
Latinsafe
Eurosafe
Arabsafe
Choosing Wisely

RAD-AID Kenya

Under the leadership of Sara Iosifescu, RAD-AID Director of Health Finance, RAD-AID conducted a Radiology-Readiness assessment in Kenya in 2013 with support from the ASRT Foundation to design educational outreach efforts for technologists in Nairobi. Ms. Iosifescu is designing a microfinance support program for individuals interested in receiving radiology technologist training in Kenya.

In 2014, RAD-AID collaborator, Dr. Woojin Kim, returned to Kenya to lead multiple training workshops on clinical radiology and digital imaging technologies. Dr. Kim works with the Pan African Congress on Radiology and Imaging (PACORI). He is part of a collaborative initiative called AFROSAFE which involves PACORI, Image Gently, and the International Atomic Energy Agency to focus on radiation protection in Africa. In his work with the Aga Khan University Hospital in Nairobi, Dr. Kim works with local partners to provide continuous medical education and lectures via web presentations.

In 2016, RAD-AID’s Radiation Oncology Program will travel to Kenyatta National Hospital and Moi Hospital in conjunction with the University of Nairobi to do educational lectures and hands-on sessions. Please sign-up to volunteer with RAD-AID Radiation Oncology.

Imaging for Radiation Therapy Planning
Promotion of appropriate imaging: other ways RAD-AID can help Member States

– Capacity building
  • In-country teaching, including sharing broadly available RP resources for patients like RadiologyInfo.org
  • Promotion of clinical imaging referral guidelines:
    – RC iRefer, CAR National Practice Guidelines, ACR appropriateness criteria/ACR Select, WA Diagnostic Imaging Pathways…
    – Clinical Decision Support (CDS) integrated w/in image requisition process
  – Strengthen system capacity for retrieval of outside imaging
  – Promote patient dose recording in the electronic medical record
    • Cumulative dose tracking
### RCR: Abdominal pain in children

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Dose</th>
<th>Recommendation [Grade]</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>None</td>
<td>Indicated [B]</td>
<td></td>
</tr>
<tr>
<td>AXR</td>
<td></td>
<td>Specialised investigation [C]</td>
<td>AXR is rarely of value and is best performed under specialist guidance. Generally AXR is not undertaken before US.</td>
</tr>
<tr>
<td>CT</td>
<td>![Radiation Symbol]</td>
<td>Specialised investigation [B]</td>
<td>Although CT is more sensitive than US for the diagnosis of appendicitis, specificities are similar and the strategy for imaging should take into account radiation dose and clinical features.</td>
</tr>
<tr>
<td>MRI</td>
<td>None</td>
<td>Indicated only in specific circumstances [B]</td>
<td>Following abdominal US, when TVUS is not feasible, MRI is occasionally helpful for evaluating pelvic masses in girls.</td>
</tr>
<tr>
<td>P21: Intussusception in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P22: Ingested foreign body in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P23: Blunt abdominal trauma in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P24: Projectile vomiting in infants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P25: Recurrent vomiting in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P26: Persistent neonatal jaundice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P27: GI bleeding (per rectum) in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P28: Acute abdominal pain in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P29: Constipation in children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P30: Palpable abdominal/pelvic mass in children</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Merci!

Contact us at info@rad-aid.org
https://www.rad-aid.org
WFUMB’s Role in Ultrasound Safety

Professor Jacques S. Abramowicz, MD

WFUMB and University of Chicago
World Federation for Ultrasound in Medicine and Biology

WFUMB helps bring sustainable ultrasound programs to the underserved areas of the world to improve global healthcare through collaboration, communication, and education.

**Member organizations**

- AFSUMB: Asian Federation of Societies for Ultrasound in Medicine and Biology
- AIUM: American Institute of Ultrasound in Medicine
- ASUM: Australasian Society for Ultrasound in Medicine
- EFSUMB: European Federation of Societies for Ultrasound in Medicine and Biology
- FLAUS: Federación Latinoamericana de Sociedades de Ultrasonido en Medicina y Biología
- MASU: Mediterranean and African Society of Ultrasound

**Statistics**

- 6 Member organizations
- 89 Countries
- 51,155 Individual members
WFUMB runs 13 COEs

Bangladesh Society of Ultrasonography (BSU), Bangladesh, established in 2004
Uganda Association of Sonography (UGASON), Uganda, established in 2004
Sociedad Venezolana de Ultrasonido en Medicina (AVUM), Venezuela, established in 2005
Romanian Society of Ultrasound in Medicine and Biology, Romania, established in 2007
Indonesian Society of Ultrasound in Medicine, Indonesia, established in 2011
Kenya Society of Ultrasound in Medicine and Biology (KESUMB), Kenya, established in 2013
Mongolian Society of Diagnostic Ultrasound (MSDU), Mongolia, established in 2013
Nigerian Society of Ultrasound Practitioner (NSUP), Nigeria, established in 2013
Societe Togolaise D'Ultrasonographie Medicale, Togo, established in 2013
Ethiopian Ultrasound Society, Ethiopia, established in 2014
Sociedad Paraguaya de Ecografia, Paraguay, established in 2015
Khartoum, Sudan, accepted to establish in 2017
Chisinau, Moldavia, accepted to establish in 2017
WFUMB’s Role in Ultrasound Safety (1)

- Safety Committee (J. S. Abramowicz, USA, Chair; D. E. Evans, UK; Brian Fowlkes, USA; Gail terHaar, UK; K. Marsal, Sweden)

- WFUMB's Safety Committee periodically releases statements and recommendations on various internationally-relevant safety issues.

- Ultrasound Bioeffects and Safety Literature reviews

- Response to lay press “alarm” articles
WFUMB’s Role in Ultrasound Safety (2)

- WFUMB/ISUOG statement on the safe use of Doppler Ultrasound
- WFUMB/ISUOG policy statement on souvenir imaging of the fetus
- WFUMB recommendations on non-medical use of ultrasound
- Scanning at commercial exhibitions document
- Clinical safety statement for diagnostic ultrasound: an overview
- Guidelines for cleaning transvaginal ultrasound transducers between patients.
- WFUMB Statement on ultrasound exposure in the first trimester and autism spectrum disorders

http://www.wfumb.org/safety-statements/
WFUMB’s Role in Ultrasound Safety (3)

- Dissemination of information
- Education of members
- Education of trainees
- Cooperation with ultrasound manufacturers
- Participation in National and International workforces (such as WHO)
Non-ionizing radiation

Ionizing Radiation

Acoustic fields

https://thebrainstimulator.net/brain-stimulation-comparison/
The Ionizing Radiation Paradigm

Scientific basis
Effects, risks, sources, levels, trends, ...

Recommendations
System of RP (philosophy, principles, dose criteria, ...)

Standards
(safety requirements, regulatory language, ...)

National regulations
The Non-Ionizing Radiation Landscape

Scientific basis  
Effects, risks, sources, levels, trends, ...

Recommendations  
System of RP (philosophy, principles) limits, ...

Standards  
(safety requirements, regulatory language,..)

National regulations