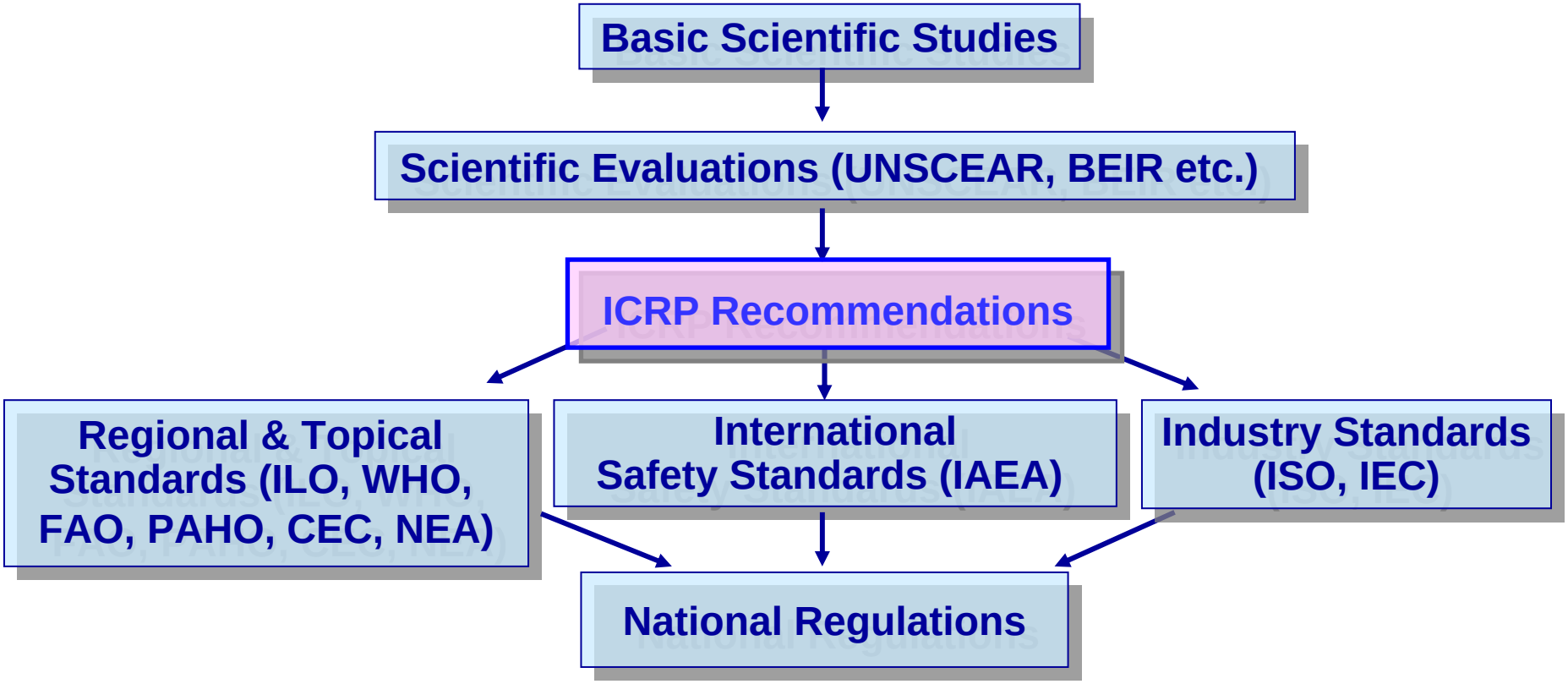
Internationale Aktivitäten zur sicheren Anwendung von Strahlen in der Medizin

Ferid Shannoun

Arbeitsgemeinschaft der Deutschen Röntgengesellschaft

Physik und Technik
in der bildgebenden Diagnostik

International Radiation Protection



International key players in radiation safety

- UNSCEAR, ICRP
- IAEA
- WHO, AMRO/PAHO

- International Professional Societies (IOMP, ISR, ASTRO, ESTRO, etc)
- others

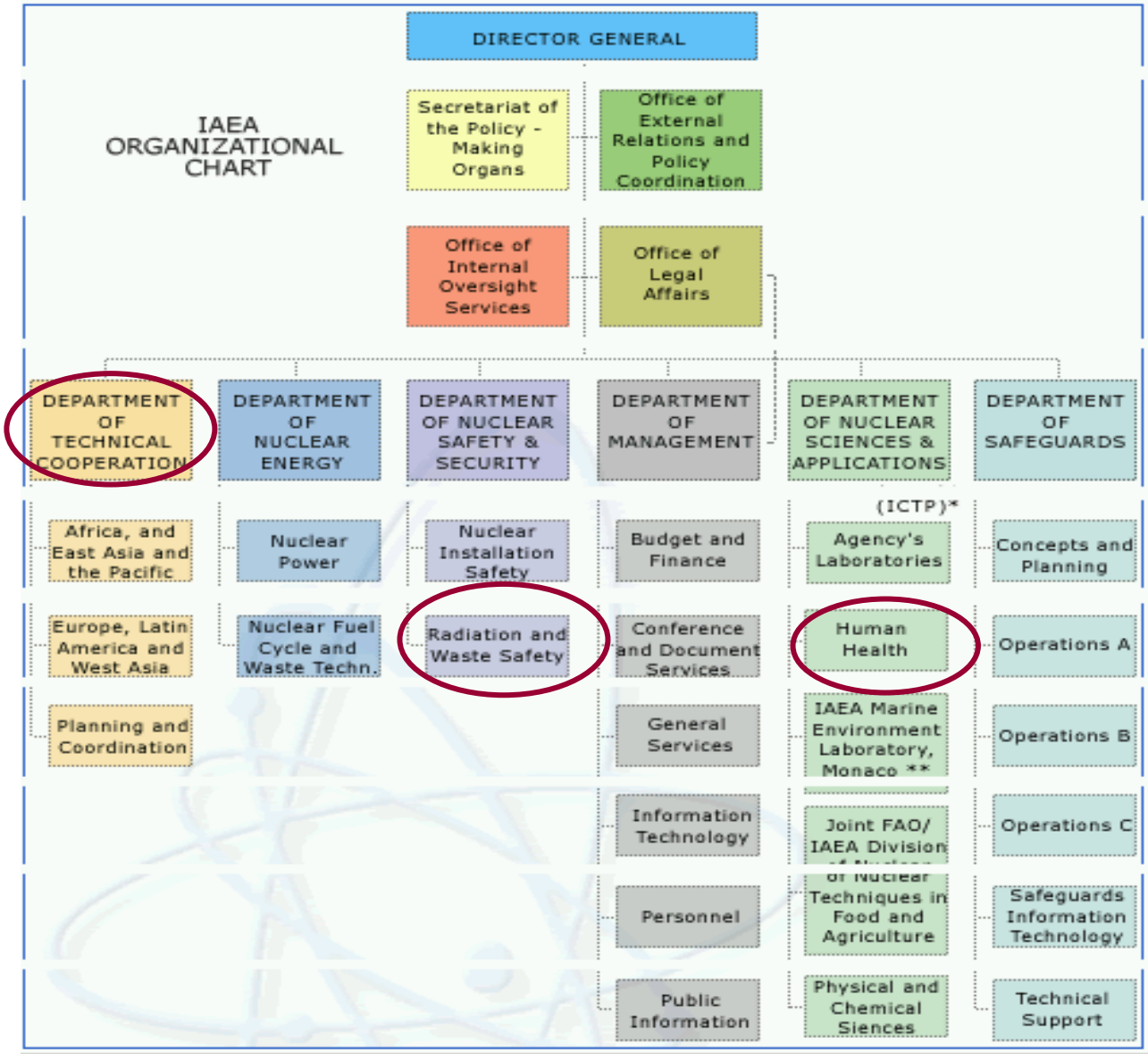
IAEA

Set up as the world´s "Atoms for Peace" Organization in **1957**.

2200 multi-disciplinary professionals

The IAEA has **146** Member States.
18 countries wait for ratifications.

IAEA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DEPARTMENT OF MANAGEMENT
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Nuclear Power
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(ICTP)*
Agency's Laboratories
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Operations C
Safeguards Information Technology
Technical Support

http://rpop.iaea.org

Radiation Protection of Patients - Microsoft Internet Explorer provided by WHO

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Nucleus

IAEA | Radiation Protection of Patients (RPoP)

Search RPoP: GO

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Be Informed About the *Safe Use* of Ionizing Radiation in Medicine

Information to help health professionals achieve safer use of radiation in medicine for the benefit of patients

Information For
Health Professionals
Member States
Patients

Additonal Resources
Publications
International Standards
Training

Special Groups
Pregnant Women
Children

Member Area
Member States Area
Drafts Management Area

Actions to Protect Patients In:
- Radiology
- Radiotherapy
- Nuclear Medicine
- Interventional Radiology
- Interventional Cardiology
- Other Specialities & Imaging Modalities

Latest Literature

Ford, E.C., Gaudette, R., Myers, L., Vanderver, B., Engineer, L., Zellars, R., Song, D.Y., Wong, J., Deweese, T.L.,
Evaluation of safety in a radiation oncology setting using failure mode and effects analysis, Int. J. Radiat. Oncol. Biol. Phys. **74** 3 (Jul. 2009) 852-858.

Law, M., Liu, R., Ng, S., Luk, M.Y., Leung, T.W., Au, G.K.,
Radiation dose measurements for personnel performing 90Y-ibritumomab tiuxetan administration: A comparison between two injection methods for dose reduction, Br. J. Radiol. **82** 978 (Jun. 2009) 491-496.

Einstein, A.J.,
Medical imaging: The radiation issue, Nat. Rev. Cardiol. **6** 6

Did You Know That...

17. Only very few patients undergoing interventional procedures are expected to have skin injuries and need to report back for a check-up

« Prev Next »

Latest News

Proton therapy promises reduced risk of second cancer in paediatric patients
Children receiving radiation therapy for cancer have great improvements in survival rates

Training material on Radiation Protection in PET/CT online now
The approved training material on Radiation Protection in PET/CT is now available online for free download

All News

Upcoming Events

Addressing Overutilization of Medical Imaging, Washington, 6-7 August 2009
American Board of Radiology Foundation in collaboration with ABR & NIBIB is holding a summit

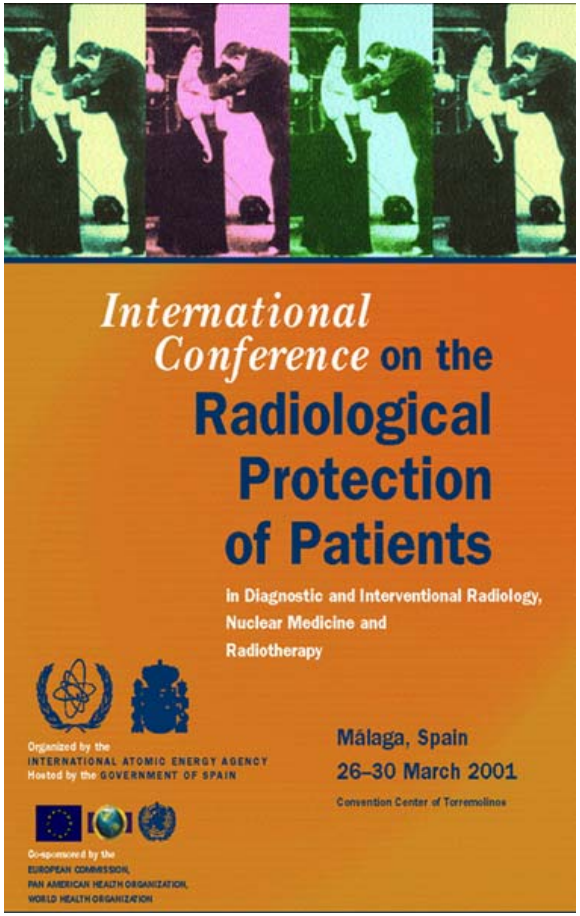
International Workshop on Justification of Medical Exposure in Diagnostic Imaging, Brussels, Belgium, 2-4 September 2009
A workshop on justification of Medical Exposure in Diagnostic Imaging

/RPOP/RPoP/Content/index.htm Internet

Start D:\My Document... D:\May Meeting ... 9 Microsoft Offi... Radiation Prote... FR 00:28

The International Action Plan for the Radiation Protection of Patients

- Oct 1999 IAEA GC Resolution
  - To organize, in close collaboration with WHO, an international meeting on the radiological protection of patients for the purpose of:
    - An exchange of information
    - Development of recommendations the RP of patients
- March 2001 Malaga Conference
  - Hosted by Government of Spain
  - Co-sponsored by:
    - IAEA, WHO, PAHO, EU
  - Organized in co-operation with:
    - UNSCEAR, ICRP, IOMP, IRPA, ISRO, ISRRT, ISR, WFNMB
  - Many recommendations for radiation protection of patients



The International Action Plan for the Radiation Protection of Patients

- Following the Malaga conference
  - IAEA Technical Meeting, **2002**
    - Experts from 16 Member States
    - Representatives from
      - WHO, PAHO, EU, UNSCEAR, ICRP, ICRU, ISO, IEC, IOMP, ISRO, ISRRT, ISR, WFNMB
    - Using the findings of the Malaga Conference
    - Recommended the *International Action Plan for the Radiological Protection of Patients*
- International Action Plan approved by IAEA Board of Governors, **2002**
- Steering Panel established **2003**
  - To review the implementation and to give guidance on a continuing basis

The International Action Plan for the Radiation Protection of Patients

Objectives

To make progress in radiation protection of the patient as a whole, which includes:

- Recognizing the benefits of & the need for medical radiation
  - Promoting RPoP but without limiting the medical benefits
  - Ensuring that RPoP is an integral part of medical practice
  - Ensuring the level of RP is commensurate with the risk
- Collaboration with international organizations and professional societies
- Using mechanisms including education & training, technical assistance, research and information exchange
- Addressing new and evolving technologies

Example training CD

Approved Training Package

IAEA Training Material on
Radiation Protection in Nuclear Medicine

READY FOR A NEW PATIENT

King Faisal Specialist Hospital and Research Center, Riyadh

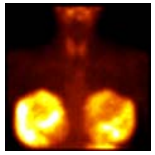
Shall the patient be hospitalized?

Can the patient leave?
Any restrictions?

PREGNANCY AFTER THERAPY

Radiopharmaceutical	All activities up to (MBq)	Avoid pregnancy (months)
Au-198 colloid	10000	2
I-131 iodide (thyroid ca)	5000	4
I-131 iodide (thyrotoxicosis)	800	4
I-131 MIBG	5000	4
P-32 phosphate	200	3
Sr-89 chloride	150	24
Y-90 colloid (arthritic joints)	400	0
Y-90 colloid (malignancy)	4000	1

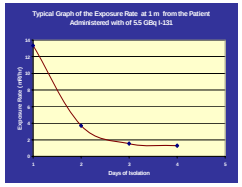
BREASTFEEDING



SAFE ADMINISTRATION

Avoid mis-administration

PATIENT SURVEY



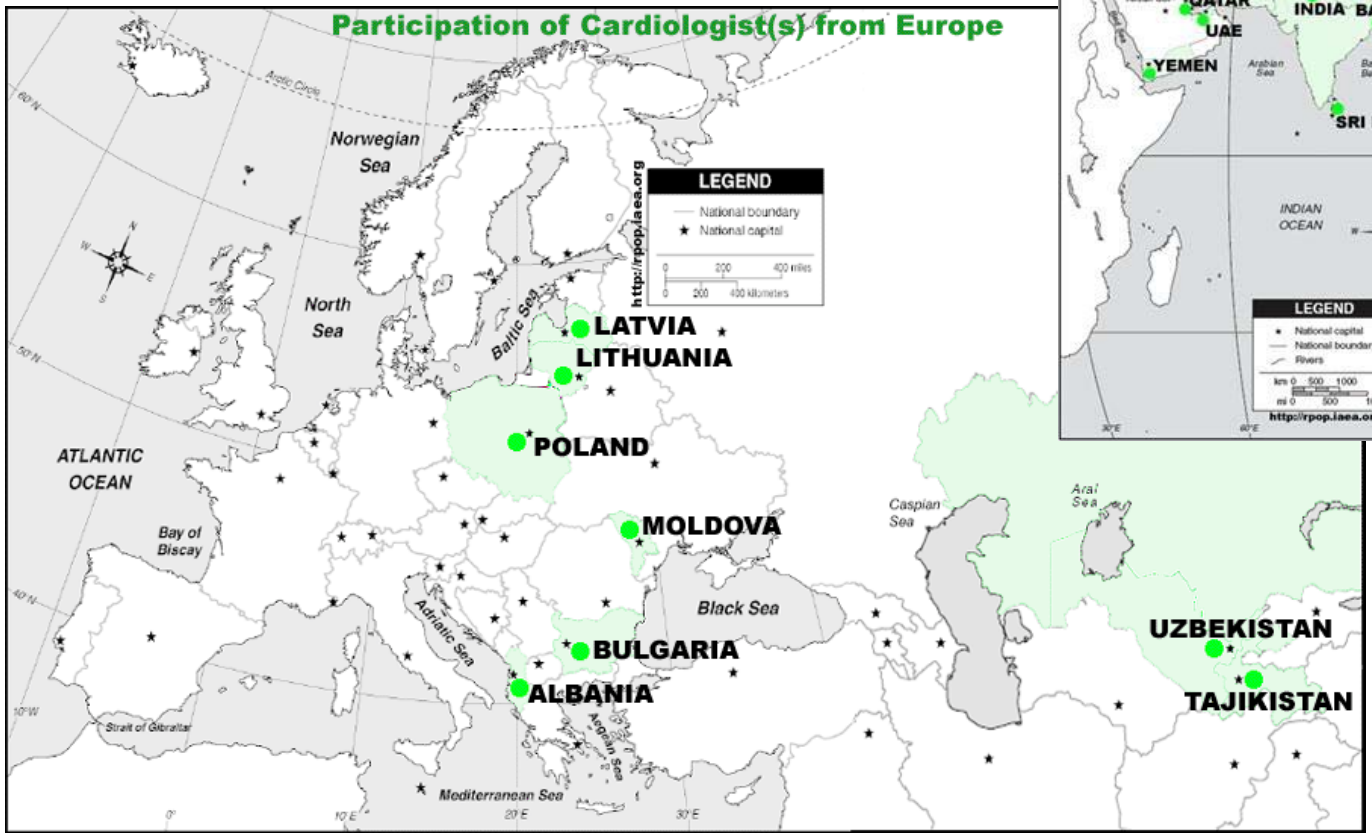
Abdalla Al-Haj

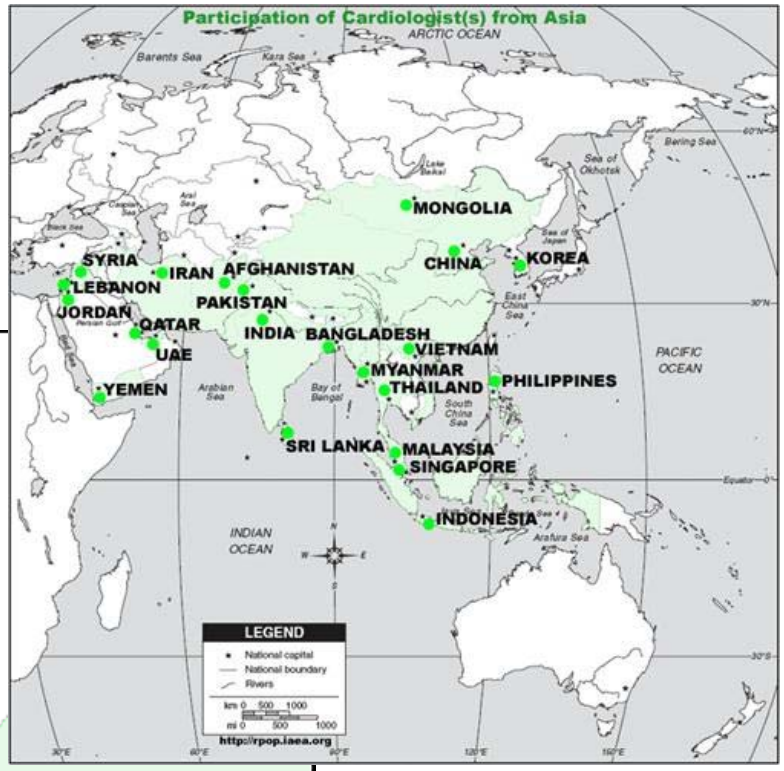
in collaboration with

Version: January 2005 (reprint August 2007)

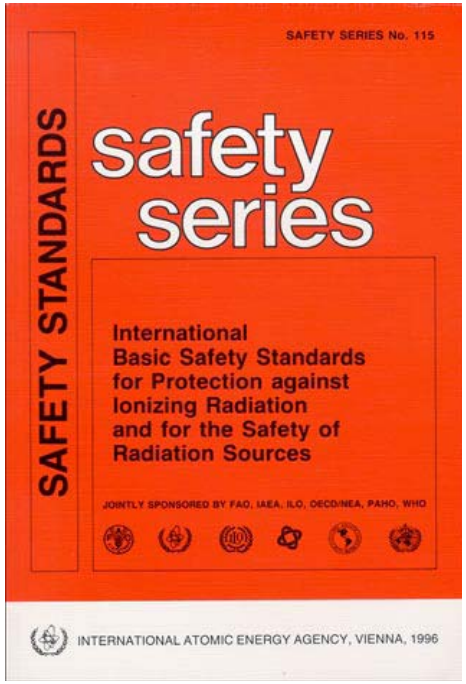
http://rpop.iaea.org

Cardiology Training Courses





Basic Safety Standards – BSS 115



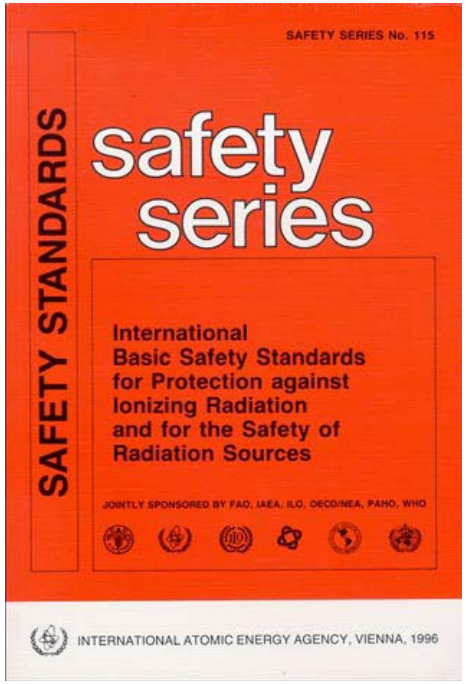
International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources

Published 1996

A “Requirements” level standard

International Cooperation
IAEA, WHO, PAHO, FAO, ILO, OECD/NEA

Basic Safety Standards – BSS 115



- BSS – gives requirements
  - Under revision
  - Medical exposures section
    - Drafted by WHO, PAHO & IAEA
    - Reflects recommendations from IAP and subsequent Steering Panel meetings
- Review 2006
- Revision commenced 2007
- Draft v2.0 July 2009

IAEA/PACT

Placing cancer on the global health agenda

Improving cancer survival in developing countries

Programme of Action for Cancer Therapy
IAEA | PACT
Atoms for Peace: The First Half Century 1957–2007

pact@iaea.org

Help expand radiotherapy capacity in developing countries to address the huge disparities that exist in cancer care services by:

- Establishing a well coordinated IAEA cancer programme with **harmonised strategy**
- Integrating IAEA's radiotherapy assistance into **public health** and **cancer control systems**
- Advocating a country level **bottom-up approach**

WHO-IAEA Joint Programme for Cancer Control

ACCESS TO RADIOTHERAPY

pact@iaea.org

Radiotherapy is an essential part of the treatment of cancer

Over 30 African and Asian countries have no access to radiotherapy

There is a shortfall of over 5000 radiotherapy machines in the developing world

IAEA has initiated PACT to comprehensively address this urgent problem

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Availability of treatment

Number of people served by a single radiotherapy centre (*latest available data 1995–2003*)

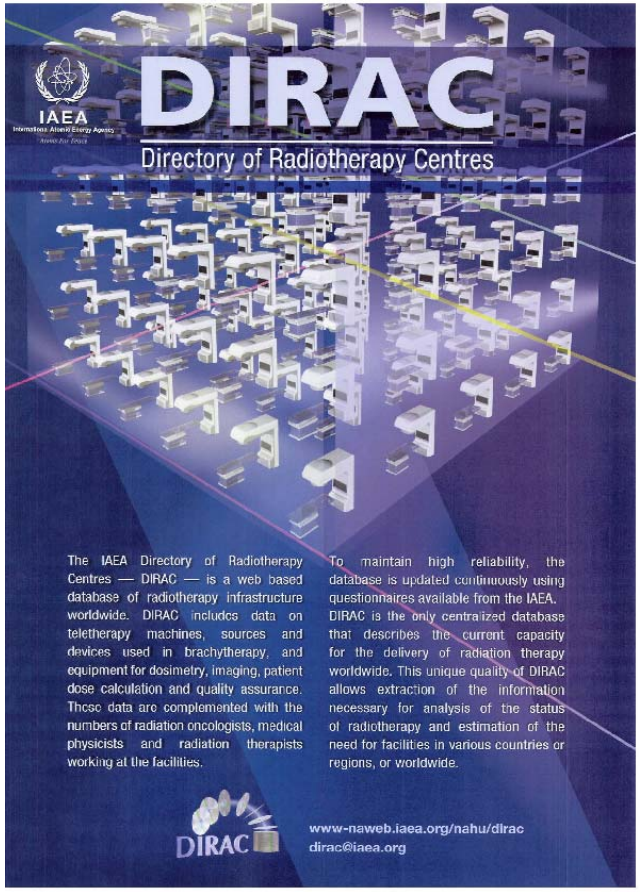
- below 500 000
- 500 000–999 999
- 1–4.9 million
- 5–9.9 million
- 10–19.9 million
- 20 million and above
- no centre
- no data

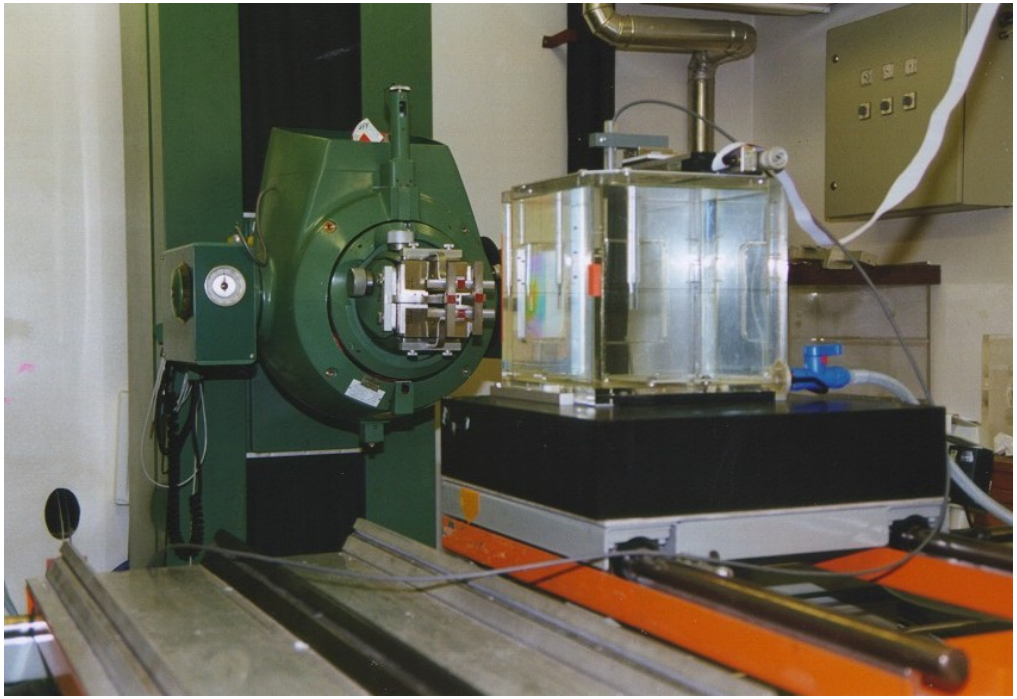
IAEA | Programme of Action for Cancer Therapy PACT

Atoms for Peace: The First Half Century 1957–2007

IAEA & WHO collaboration

- Secondary Standards Dosimetry Laboratories (SSDL)
- Directory of Radiotherapy Centers (DIRAC)





WHO Structure

193 Member States
Ministries of Health

Headquarters Geneva

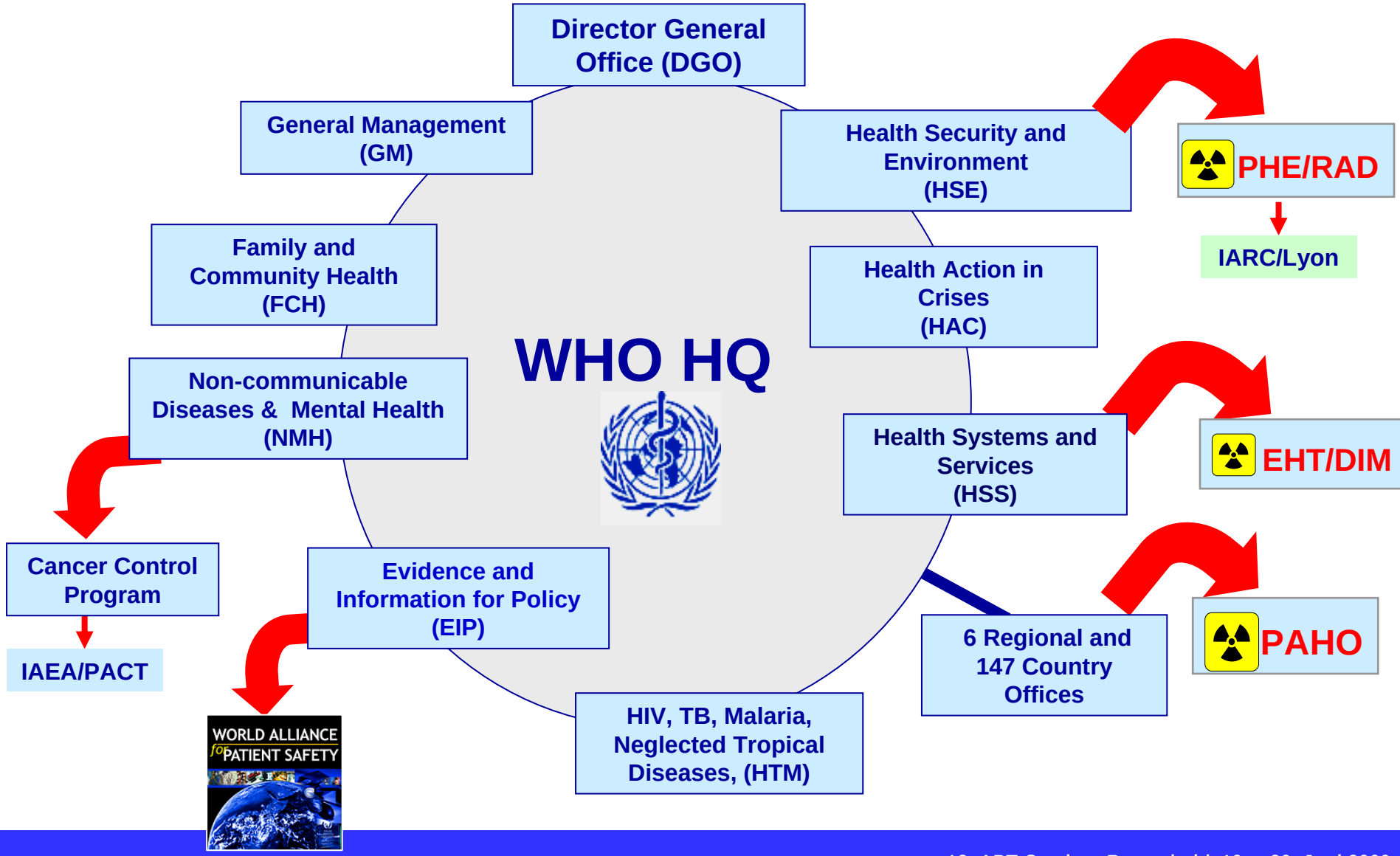
6 Regional Offices

147 Country Offices

+ IARC

WHO Regional and Country offices

WHO Radiation and Health

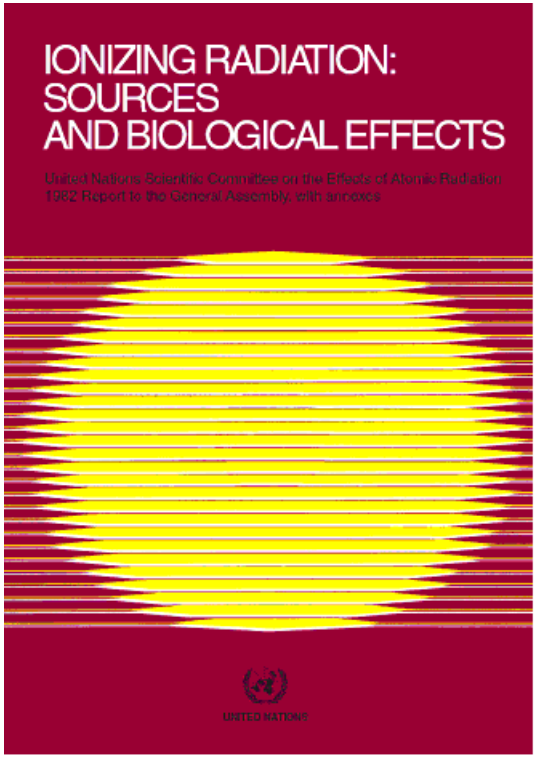


WHO Radiation and Health

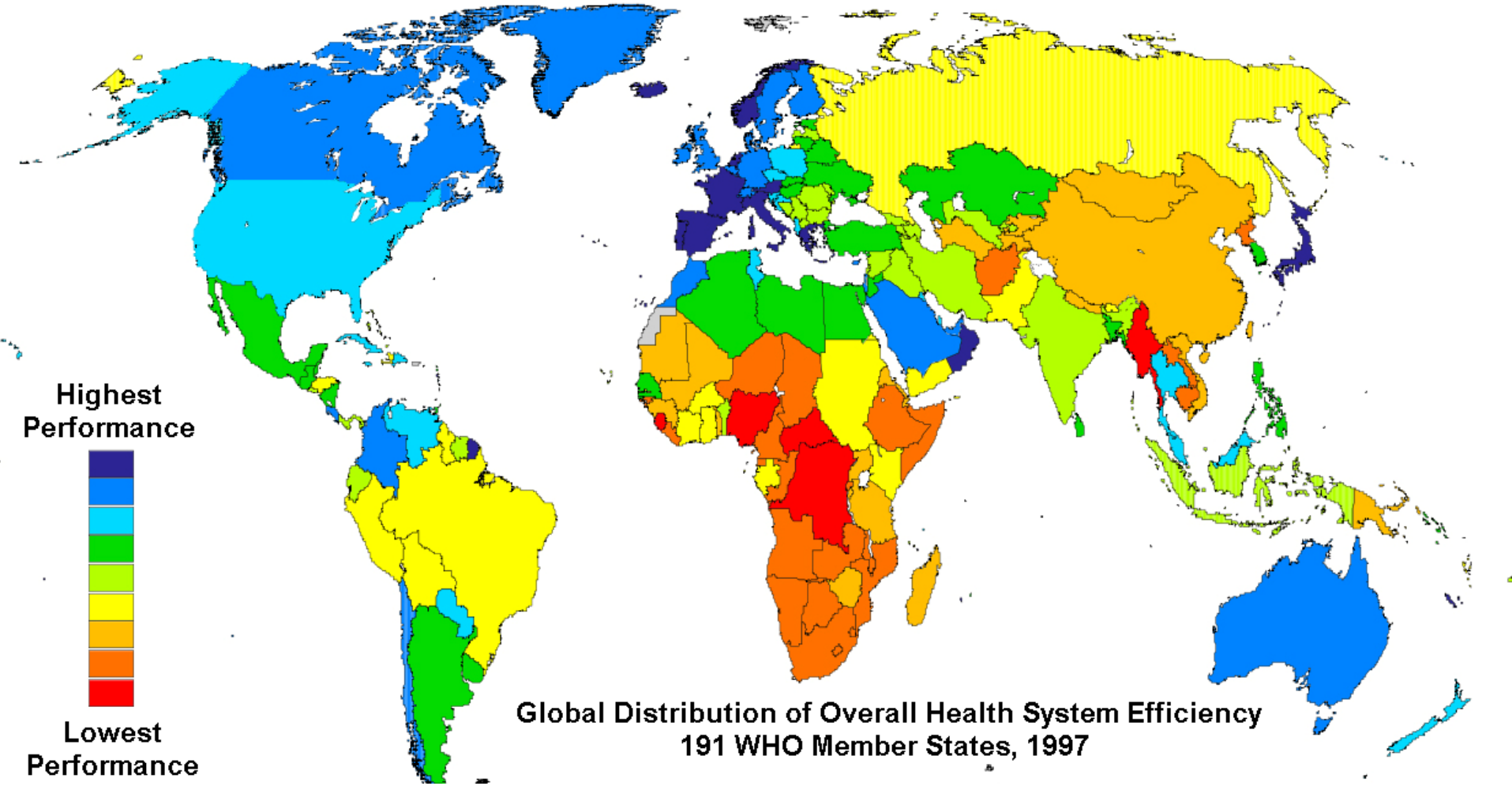
1972:

WHA 25.57 resolution to assist MS in promotion to radiation medicine and to cooperate with IAEA and UNSCEAR

1982:
UNSCEAR/WHO joint survey on radiological equipment and frequency of diagnostic and therapeutic procedures



Diagnostic Imaging Worldwide



WHIS-RAD System

Global Steering Group for Education and Training in Diagnostic Imaging

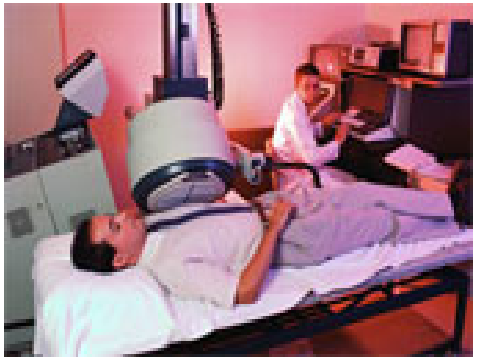
- Established 1999
- 'Train the trainers'
- Local 'centres of excellence'
- Representatives from major global and regional societies and organizations:
  - Permanent members: ISR, ISRRT, WFUMB, WFNMB
  - Regional societies: ESR, CIR, RSNA, MASU, AFSUMB, AOSR, SFR, ACR, ARRS
  - Temporary members: related to activities

WHO's Global Initiative

The use of radiation in health care is by far the largest contributor to the exposure of the general population from artificial sources

Annually worldwide

3,600 million X-ray exams (> 300 million in children)



37 million nuclear medicine procedures

7.5 million radiation oncology treatments

WHO's Global Initiative

ACTIONS ON

Diagnostic radiology

Interventional radiology

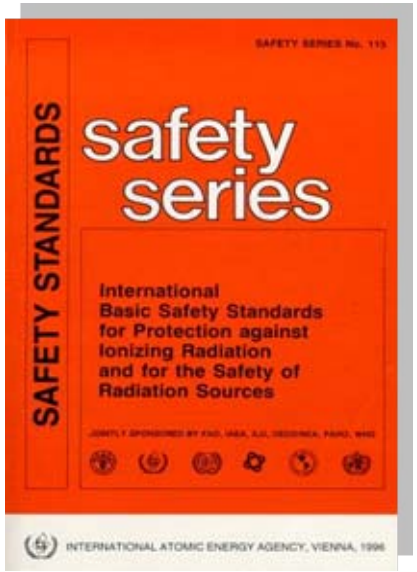
Radiotherapy

Nuclear Medicine

Focusing on Public Health aspects related to the risks and benefits of the use of radiation in health care

WHO's Global Initiative

- The Global Initiative aims to improve implementation of BSS in medical settings, and to mobilize the health sector towards **safer** and **effective** use of radiation in medicine



The Global Initiative seeks to complement the International Action Plan for Radiological Protection of Patients established by the IAEA

WHO's Global Initiative

Risk assessment	• *Collect and share information on the use of radiation in health care, including surveys on population dose distribution .* • *Shape and promote a research agenda on adverse health effects of medical radiation exposure (focusing on children)*
Risk management	• *Reduction on unnecessary radiation exposures through justification of medical procedures (i.e. use of referral guidelines) and optimization of protection* • *Advocacy tools and guidance for health authorities and policy makers (including regulatory aspects)* • *Clinical audit and quality improvement* • *Occupational health in radiological medical facilities* • *Capacity building (education, training)* • *Strategy to address staffing needs (medical physicists, radiographers, radiation technologists)* • *Harmonization of error reporting systems and severity scale grades*
Risk communication	• *Communication strategy for information and awareness raising (including risk communication to patients)*

WHO's Global Initiative

- *Develop proposal*
- *Internal/external consultation*
- *Identify/consult stakeholders*
- *Build partnership*

Step 1

Outline of the strategy

- *Platform*
- *Terms of reference*
- *Projects/activities*
- *Working groups*
- *Task Coord. Team*
- *Budget, fundraising*

Step 2

Development of the work plan

- *Priorities*
- *Pilot experience*
- *Task execution*
- *Working groups operating*

Step 3

Implementation of the GI

- *Monitor implementation*
- *Evaluate the impact*
- *Feedback and results communication*

Step 4

Monitoring, evaluation

Dec. 2008 — *June 2009* — *June 2011* — *Dec. 2011*

We are here now

http://www.who.int/ionizing_radiation

WHO | Medical radiation exposure - Microsoft Internet Explorer provided by WHO

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Ionizing radiation

WHO > Programmes and projects > Ionizing radiation > About Ionizing Radiation

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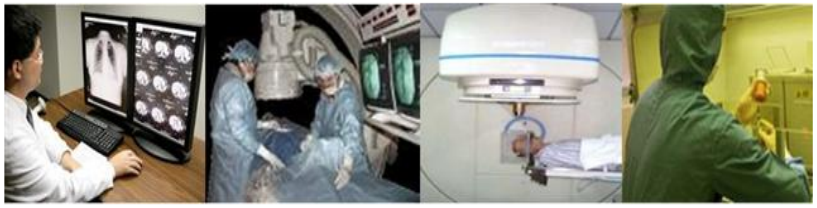

Medical radiation exposure

The use of radiation in medicine has led to major improvements in the diagnosis and treatment of human diseases. Annually, worldwide, more than 3,600 million X-ray examinations are performed, 37 million nuclear medicine procedures are carried out, and 7.5 million radiotherapy treatments are given. As the benefits for patients gain recognition, the use of radiation in medicine increases.

WHO Global Initiative on Radiation Safety in Health Care Settings

BACKGROUND
MEETING DOCUMENTATION
USEFUL LINKS

While the development of modern health technology makes new applications safer, their inappropriate use can lead to unnecessary or unintended radiation doses, and can cause potential health hazards for patients and staff.

WHO is responsible for recommending evidence-based public health policy to protect health and reduce radiation risks and for the provision of technical support and capacity building on radiation protection and health.

Medical radiation exposure: 1,2 | Next page

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PAHO/AMRO

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Interventional Radiology
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Mammography
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Nuclear Medicine
DPC/CD
DPC/NC
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Linear Accelerators
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Patients Safety
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Public Safety
Planning
Purchase
Maintenance
Cost Analysis
Infrastructures
Human Resources
Professional Societies
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ALFIM
CIR
ALATRA
ISRRT
IRPA
WHO
PHE/RAD
EHT/DIM
CHP/CPM
PAHO/WHO Collaborating Centers
Breast Imaging
Ultrasound
Biological Effects of EMF
Radiological Emergencies
IAEA
TC
NAHU
NSRW
PACT
International Partners
IACRS, IARCNA, RASSC
IAP for RP of Patients
Joint Emergency Plan
BSS Secretariat

Training courses for Medical Physicists and Radiation Oncologists

- 1992 Cuba
- 1998 Ecuador
- 2002 Colombia
- 2004 Uruguay (Clinical QA)
- 2005 Brazil
- 2007 Cuba
- 2007 Colombia
- 2008 Mexico (Clinical QA)

IAEA cooperation with PAHO/WHO

EL FÍSICO MÉDICO:
Criterios para su Formación Académica, Entrenamiento Clínico y Certificación

REPORTE del Proyecto ARCAL LXXXIII

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Scientific Secretaries:
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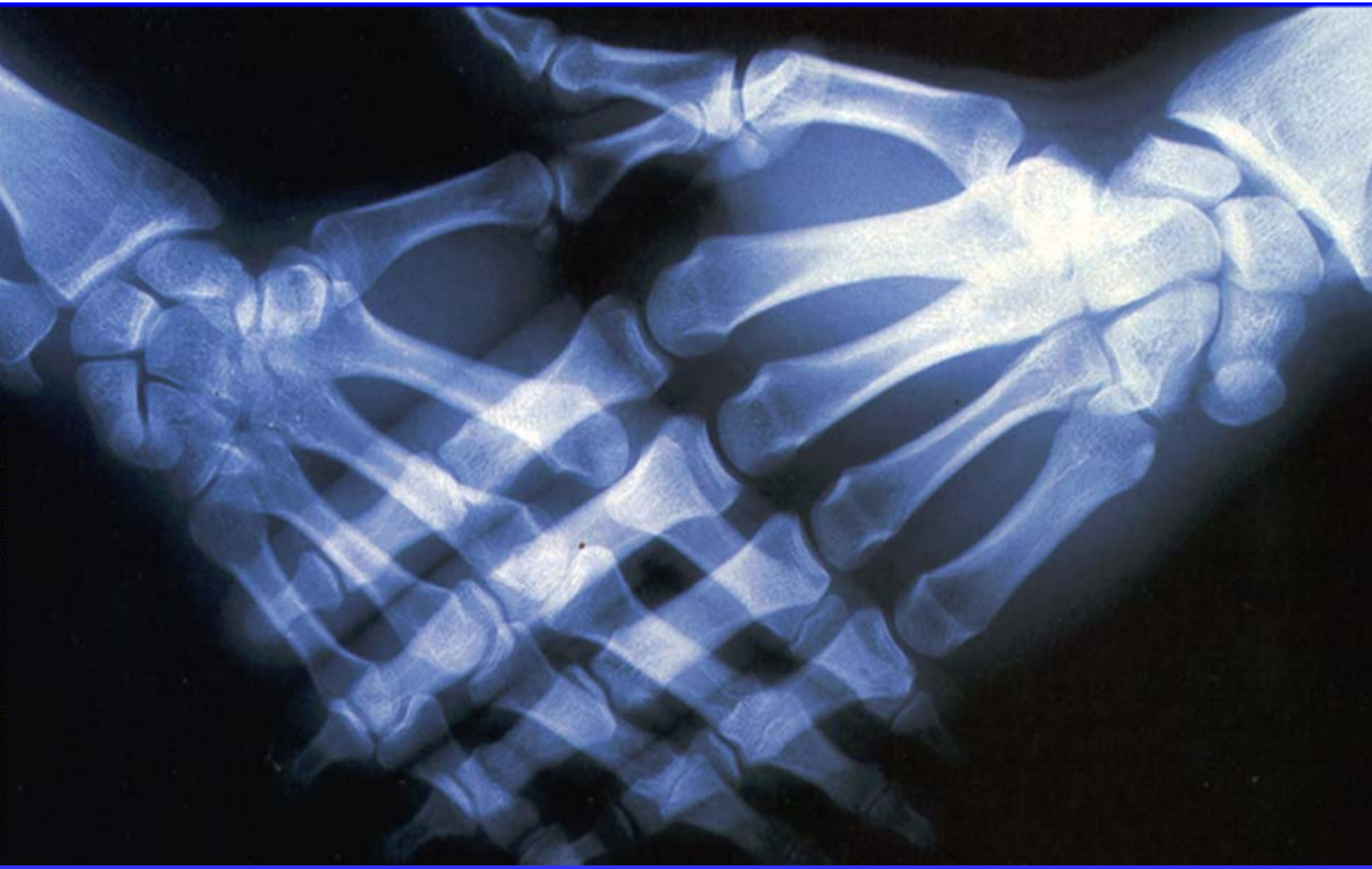
P Jimenez (PAHO)

INTERNATIONAL ATOMIC ENERGY AGENCY IAEA

- Strengthening the Performance in the Area of Medical Physics for the Professional Staff in Latin America
- Expand the experience to other parts of the world
- Translate and disseminate this report to as much as possible languages and countries in the world

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