

Session II: Ensuring the infrastructure for a safe use of radiation in medicine

The vision of the IAEA



IAEA

International Atomic Energy Agency

The use of radiation in medicine

Issues when using radiation in medicine (1: Benefits)

- The use of radiation in medicine has brought and continues to bring tremendous **benefits to the global population**
- UNSCEAR 2008 Report: More than **10 million procedures** using ionizing radiation in medicine **per day** for diagnostics, interventions and treatment
- Impacting directly on citizens of **all MS**
- Access to this technology continues to grow globally

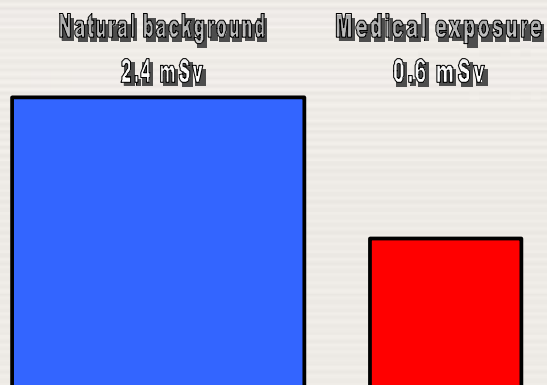


The use of radiation in medicine

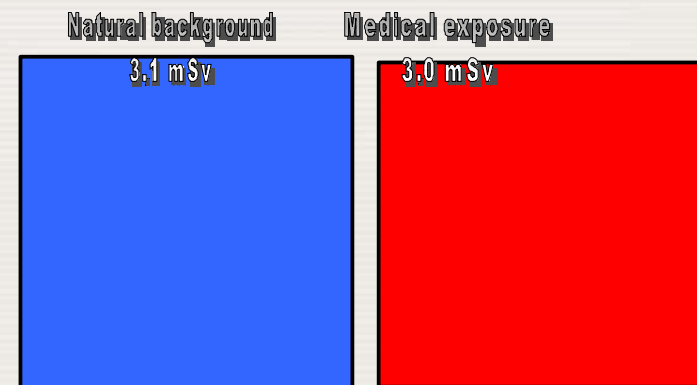
Issues when using radiation in medicine (2: Increasing exposure)

- Global annual per capita **effective dose is increasing rapidly**, nearly exclusively due to the increasing medical exposure, and is now equal to or exceeding that from natural background in some countries
- **Medicine accounts for more than 99.9%** of the per capita effective dose from man-made sources
- Evidence shows that a substantial percentage of medical procedures using ionizing radiation is **lacking in justification and optimization**
- A substantial fraction of the effective dose per capita from medical exposure is unnecessary, bringing an **unnecessary radiation burden** to the global population

UNSCEAR 2008
Global annual per caput effective dose



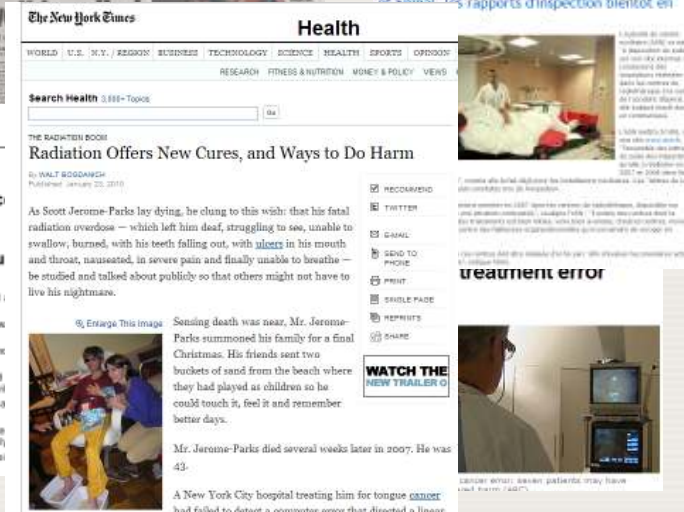
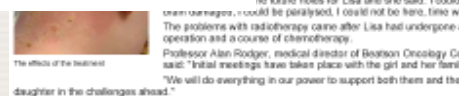
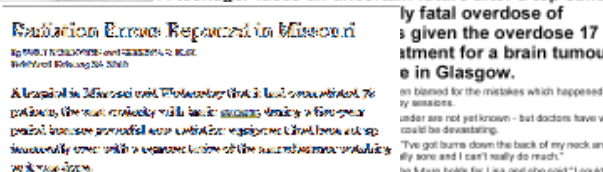
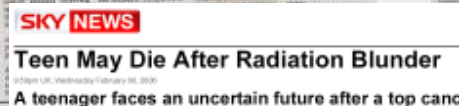
NCRP160 2009
U.S. annual per caput effective dose



The use of radiation in medicine

Issues when using radiation in medicine (3: Radiation accidents)

- Radiation accidents involving medical uses have accounted for more acute **radiation deaths than any other source**, including Chernobyl
- Over the last three decades, at least 3000 patients have been affected by radiotherapy incidents and accidents (estimated by WHO)
- Accidents do not only affect patients directly (e.g. harm and death), but might also undermine the **public's confidence** in benefiting from radiation in medicine, and preventable medical errors overall also **cost** countries billions of dollars each year



The use of radiation in medicine

Issues when using radiation in medicine (4: Occupational exposure)

- Number of **occupationally exposed workers** much greater in medicine than due to any other source or practice (>2.5 million monitored workers in medicine compared to 0.8 in industry and 0.3 as a result of military uses)
- Collective dose estimated to 850 manSv in medicine compared to 289 in industry and 45 from military uses
- Individual occupational exposure **varies widely** among those involved in medical care, and **high doses can be incurred** e.g. by those doing fluoroscopically-guided interventional medical procedures



Response to issues

Radiation protection in medicine is prioritized, as seen by ...

- **Strengthening of International BSS** in relation to medical exposures, e.g.:
 - **New requirements on responsibilities** of governments and regulatory bodies, such as ensuring establishment of DRLs, and ensuring that key personnel have appropriate education, training and competence in patient radiation protection
 - Responsibility on the licensee for the patient to be informed, as appropriate, of the potential benefit of the radiological procedure as well as radiation risk
 - Justification required for asymptomatic individuals – intended for early detection of disease
 - **Clearer terms and definitions**, such as distinguishing the roles of the “Referring medical practitioner” and the “Radiological medical practitioner”
 - New accompanying **Safety Guide** for medical practices, with more details, will be next step



Response to issues

Radiation protection in medicine is prioritized, as seen by ...

- Efforts in activities related to the **International Action Plan for Radiation Protection of Patients**



Response to issues

Radiation protection in medicine is prioritized, as seen by ...

- Efforts in activities related to medical workers in the **Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)**
 - The Working Group in Interventional Cardiology is:
 - gathering an overview picture of the situation concerning occupational exposures and radiation protection of staff in interventional cardiology all over the world
 - identifying both good practices and shortcomings, and defining actions to be implemented for assisting regulatory bodies, health professionals, dosimetry service providers and manufacturers, in improving occupational radiation protection.
 - proposing recommendations for harmonising monitoring procedures



Vision of the IAEA

To enhance safe use of radiation in medicine, it is necessary to

- Support **strengthening of infrastructure** at the levels of regulatory authorities and health authorities as well as end-users
- Ensure **effective communication between all stakeholders**, also including professional organizations, manufacturers and public/patients
- Systematically address issues relating to both **optimization and justification** of medical exposure
- Work towards **sustained capacity** in Member States through education, training, advice, guidance, assessments, missions, ...
- Continue to **build awareness** on these issues in Member States
- Optimize **communication methods** to reach not only regulatory authorities but also health professionals directly with guidance and up-to-date information
- Ensure communication is **timely** in this rapidly changing field of activity