IAEA activities in Medical Physics

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IAEA - International Atomic Energy Agency
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Division of Human Health
Dosimetry and Medical Radiation Physics Section
Medical Physics in Cancer Treatment
Supporting Women’s Health

The IAEA celebrates the International Day of Medical Physics
7 November 2017
IAEA activities in Medical Physics

Harmonization of Medical Physicists’ Education and Training

Development of Educational and Training Resources

• Medical Physics educational resources on the Human Health Campus website

Clinical Medical Physics Publications and Guidelines

The Dosimetry Laboratory in Seibersdorf

Competency Building and Training through Technical Cooperation Programme

Research Activities in Medical Physics
Harmonization of Academic Education and Clinical Training
Definition of a Clinically Qualified Medical Physicist

Define roles and responsibilities of a Clinically Qualified Medical Physics in the 3 sub-specialties (radiotherapy, diagnostic and interventional radiology, nuclear medicine)

Contribution to harmonization of education and clinical training

Promote the recognition of medical physics as a profession internationally

Recommendations for accreditation, certification and registration

Promoting and supporting Continuing Professional Development (CPD)
Academic education

guidelines for the establishment of an internationally harmonized postgraduate academic education programme in medical physics

achieve harmonized standards of competence worldwide
Clinical training

Standardized guidelines for implementation of clinical training in every medical physics sub-specialty

- Modular in structure
- Competency-based

ALSO AVAILABLE IN FRENCH AND SPANISH
Medical Physics
Education and training resources:
Handbooks
Education and training: handbooks

Comprehensive and freely downloadable handbooks, providing the basis for the education of medical physicists. Endorsed by major medical physics societies.
Handbooks’ slides

Since June 2016 the handbook slides are available for free download also in PowerPoint, after compilation of a form.

http://www-naweb.iaea.org/NAHU/DMRP/handbooks/DMRPWebForm.asp

After about 1 months > 750 downloads
Medical Physics resources for professionals: Human Health Campus website
Human Health Campus

Educational resources for professionals

Selected links to publications and scientific articles

Video tutorials

IAEA Human Health Campus

Web based e-learning material

Concise explanations of scientific topics

Includes different disciplines related to human health

links to IAEA publications
Human Health Campus

Resources and Learning for Health Professionals
The IAEA online information resource for health professionals working in nuclear medicine, radiation oncology, medical physics, and nutrition, providing insight into the different aspects of modern clinical practice.
more »

In the Spotlight
International Conference on Advances in Radiation Oncology #ICARO2; Vienna, Austria; 20-23 June 2017
The conference will give health care professionals an opportunity to review the current developments in clinical applications in the fields of radiation oncology, radiation biology and medical physics, with a view to addressing the challenge of cancer management in Member States. It will also critically examine the pivotal role of emerging radiotherapy techniques in tackling the health challenges common to many Member

What's New
New (open source) paper published in the JNM on, Standardization of administered Activities in Pediatric Nuclear Medicine
Fifth Newsletter of Nutritional & Health-Related Environmental Studies Section
Cardiovascular: ASNC Guidelines and Standards
Radiotherapy in Children
A Guide To FDG PET/CT In Clinical Oncology

https://humanhealth.iaea.org
Web-based e-learning material for medical physics
Clinical medical physics: guidelines and technical documents
Scientific and technical guidelines

Comprehensive clinical audit guidelines

Guidance on how to safe transition to new technologies

Professional Medical Physics publications
Endorsed by major medical physics professional societies

Support for best practice

How to plan and set up radiation facilities

Quality Assurance

Clinical Dosimetry

Free download
Radiotherapy publications
Diagnostic Radiology publications

Freely downloadable
Nuclear Medicine Physics Publications

Many other publications available, please visit iaea.org
Support to clinical medical physics: The Dosimetry Laboratory
Dosimetry Laboratory in Seibersdorf

Central Laboratory of the IAEA/WHO SSDL Network

Dosimetry audits

Calibration services to Member States

Education and research activities in dosimetry

Dissemination of best practices in dosimetry
IAEA / WHO Network of SSDLs

Calibration facilities at the IAEA dosimetry laboratory, central laboratory for the IAEA/WHO Network of SSDL

support in the correct application of guidelines and dosimetric measurements for applications in radiotherapy, diagnostic radiology and radiation protection
Beams produced by radiotherapy machines need to be calibrated, since the quality and effectiveness of the medical radiation therapy relies on their accuracy. The IAEA Dosimetry Lab helps participating Member States:

- checking regularly their radiotherapy facilities
- providing feedback on their quality procedures
- alerting in case of a problem
- offering a follow-up programme for quality improvement
- organizing on-site visits by local or international experts
Support to end-users in dosimetry:
Verification of clinical beam calibration

postal dose verification of radiotherapy beam outputs
Support to clinical medical physics: Expert missions, fellowships, training courses, scientific visits, workshops - Technical Cooperation Programme
Overview of TC programme

Through the Technical Cooperation (TC) programme, the IAEA helps Member States to build, strengthen and maintain capacities in the safe, peaceful and secure use of nuclear technology in support of sustainable socioeconomic development.

The TC programme:

- operates in four geographic regions: **Africa**, **Asia and the Pacific**, **Europe** and **Latin America**
- supports human resource capacity building through **expert missions** and **meetings**, **fellowships**, **scientific visits**, **special training courses** and **workshops**
- can offer **procurement of equipment** often accompanied by training

Map courtesy of Presentation Magazine website
Human Health, including Medical Physics related activities, has a predominant role in the TC core activities.

Some projects are related to medical physics only, e.g. initiating a national medical physics education program, whereas others involve collaborations with other clinical areas, including radiation safety.

During project implementation of human health projects, the IAEA Technical Officers (TO) work with TC programme managers for equipment procurement, fielding of experts, training of fellows and provide advice on the design of facilities in human health and QA/QC programmes.
Medical Physics support through Technical Cooperation

- Technical advice on appropriate technologies
- Competence building
- Expert missions
- Transfer of know-how
- Medical Physics in Technical Cooperation projects
- Scientific Visits
- Procurement of equipment
- On-the-job training
- Training courses
- Fellowships
- Customized support to Member States
- Workshops
- Dissemination of best practices
- Meetings
- Comprehensive audits of clinical radiation facilities
Support to Member States through the TC programme

Member States can receive different types of direct support and training through the IAEA Technical Cooperation (TC) programme.

**Human Health** has a predominant role in the TC core activities.

- **Training course on small field dosimetry**
- **Radiotherapy installation**
- **Expert Missions**
- **Fellowships**
- **Regional Training Courses**
- **Procurement**
Example of training - national TC projects

Upgrading the Quality Assurance and Quality Control Programme in Diagnostic Radiology for a National Breast Screening Programme (Montenegro, started in 2012).

Support through:

- 2 project meetings
- 1 expert mission for QA and acceptance testing
- Expert mission to support commissioning of the newly installed mammo/tomo/stereo units
- 9 fellowships
- 1 workshop on National Workshop on Early Breast Cancer Detection and Diagnosis
- 1 PhD in medical physics

Procurements:

- Digital mammography / Tomosynthesis
- Stereotactic biopsy unit
- Advanced QA set for digital mammography
- Consumables for breast biopsy
Collaboration is ongoing with the Master's Programme in Medical Physics (MMP), run jointly by ICTP and the University of Trieste. The programme helps address the scarcity of specialized and trained medical physicists in many countries.
Research Activities in Medical Physics
Medical Physics support through coordinated research

Knowledge exchange

Fostering scientific collaboration

Scientific meetings

Creating scientific networks

Medical Physics in CRP

Publishing results

Sharing results with Member States
International Conferences

21 CME credits for Medical Professionals
32 CPD credits for Medical Physicists

• Radiation oncologists
• Radiobiologists
• Medical physicists
• Technologists

❖ 400 participants
❖ 49 sessions
❖ 169 oral presentations
❖ 181 e-posters

Videos and slides available on the Human Health Campus
IAEA activities Medical Physics

Publications
- Handbooks
- Technical documents
- Guidelines for professionals
- Guidelines for the harmonization of education and training of medical physics
- Topics and information for professionals
- Link to selected articles and publications

Human Health Campus
- E-learning

Dosimetry Laboratory
- Dosimetry and calibration services for Member States
- Audit services

Activities through Technical Cooperation
- Competency building
- Expert Missions
- Support on the field
- Transfer of know-how

Training courses
- Fellowships
- Procurement

Research activities
- Research networks
- International scientific collaboration
Thank you!

More information and material available on
https://www.iaea.org/
https://humanhealth.iaea.org