


AAPM2015  
REINVIGORATING  
SCIENTIFIC EXCELLENCE

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# IAEA Support to Medical Physics in Africa and Latin America: achievements & challenges

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Head, Dosimetry & Medical Radiation Physics



IAEA  
International Atomic Energy Agency

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## Presentation objectives

To learn about:

1. IAEA activities in dosimetry and medical radiation physics
2. IAEA technical assistance mechanisms
3. Challenges facing medical physicists working in Latin America and Africa
4. IAEA support provided to medical physicists in Africa and Latin America



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## Scope of the presentation

This presentation is focussed on medical **radiation** physics, which is limited to the the use of radiation in

- Radiation oncology
- Nuclear Medicine, and
- Diagnostic and interventional radiology

including radiation protection aspects.



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## IAEA activities in medical physics



**CLINICAL MEDICAL PHYSICS**  
Development and harmonization  
of guidance on physical and  
technical aspects of QA to  
support safe and effective use of  
radiation in medicine



IAEA Technical Reports Series No. 438

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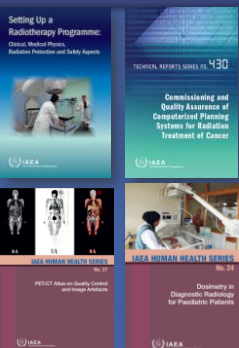
## IAEA activities in medical physics

### Guidelines

- Radiotherapy
- X-ray diagnostic & interventional radiology
- Nuclear Medicine



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## IAEA activities in medical physics

### Dosimetry Codes of Practice

- Radiotherapy
- X-ray diagnostic & interventional radiology
- Nuclear Medicine



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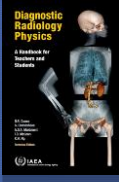

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# IAEA activities in medical physics

## Education and Training material

- Example of MSc programme
- Clinical training guides
- Handbooks

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# IAEA co-ordinated research: MP topics

- Advanced dosimetry in diagnostic and interventional radiology
- Paediatric imaging in diagnostic radiology and nuclear medicine
- Quantitative nuclear medicine imaging for patient specific targeted radionuclide therapy
- Dosimetry audits for advanced radiotherapy techniques
- Accuracy and uncertainties in radiotherapy
- Doctoral CRPs
  - ✓ Radiotherapy physics (6 Ph.D. students)
  - ✓ Advanced imaging modalities (6 Ph.D. students)






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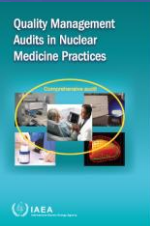
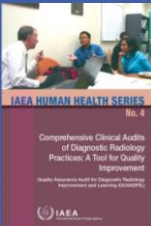
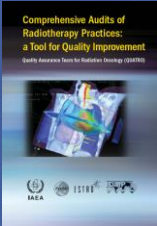
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# IAEA audits: RT, DR and NM

- ✓ All-inclusive guidelines for self-appraisal and external audit
- ✓ Includes data collection sheets to facilitate the audit process
- ✓ Aiming at quality improvement




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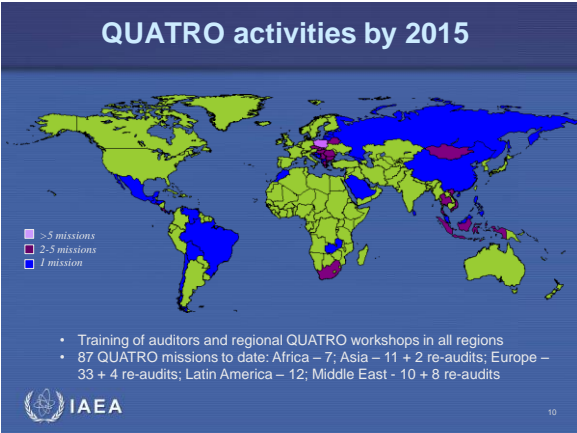
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### IAEA activities in medical physics

**DOSIMETRY SERVICES  
CALIBRATIONS & AUDITS**  
Dosimetry Laboratory  
and QA Networks

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### IAEA Dosimetry Laboratory

**Calibration services (labs)**  
IAEA/WHO SSDL Network (86 labs in 69 countries)

- ✓ Dosimetry calibrations
- ✓ Inter-laboratory comparisons
- ✓ Proficiency tests

**Dose assurance services (hospitals)**

- ✓ 2000 hospitals, 130 countries
- ✓ IAEA/WHO TLD audit services
- ✓ Support to national audit networks
- ✓ Used after commissioning of new machines.

**Main focus: dosimetry services to countries with no national infrastructure**

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## Overview

- The IAEA technical cooperation (TC) programme is **the main mechanism** through which the IAEA delivers its support to its Member States.
- All Member States are eligible for support, although TC activities focus on **the needs and priorities of low & middle income countries.**



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## Overview

- TC programme is developed and managed **jointly** by the Member States and the IAEA Secretariat.
- TC Programme is based on **requests** from the Member States
- The IAEA technical Departments are responsible for the technical integrity of the TC program.
- Yearly budget of about €120 million

About €32 million (~26%) are spent on Human Health (largest component)

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## Overview- IAEA Tech Coop Activities

- 125 countries/territories receive support from the IAEA
- Per year
  - ✓ ~ 3200 expert missions fielded
  - ✓ ~ 1600 fellowships and scientific visits
  - ✓ ~ 3200 participants in training courses
  - ✓ ~ 190 training courses
  - ✓ ~ 2500 Purchase Orders



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## Scope of IAEA support in medical physics

- Planning/Setting up new centres/Upgrades/QA
- National education programmes
- Fellowships for education and training
- Experts (equip. commissioning, on-site training, etc.)
- Procurement of equipment
- Regional training courses
- Comprehensive audits



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## Impact of IAEA support

### Direct impact: improved patient care through

- Trained staff
- Availability of equipment
- Strengthened QA, etc.

### Indirect impact: recognition of the importance and role of medical physicists

- Medical physicists are project counterparts
- Importance of multi-disciplinary team work



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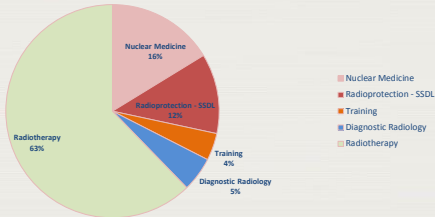
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DMRP activities in Technical Cooperation 2010-2015

Total number of projects: 345

Number of Countries: 112

DMRP activities by subject 2010 - 2015



Support to TC

July 2015

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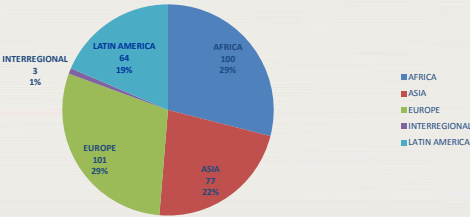
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DMRP activities in Technical Cooperation 2010-2015

Total number of projects: 345

Number of Countries: 112

Projects per Region



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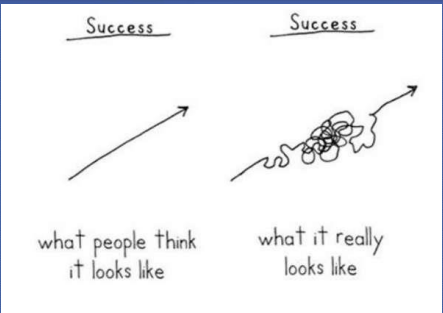
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Main challenges in Latin America and Africa



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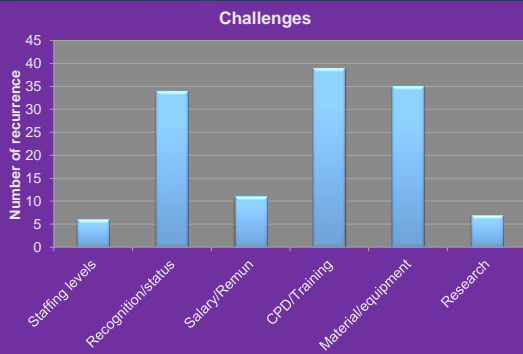
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## Main challenges in Latin America and Africa

1. Lack of professional recognition by health authorities and hospital managers, especially in imaging
2. Lack of understanding of the role and responsibilities of medical physicists in clinical environments, especially by some imaging specialists
3. Lack of medical physics education programme, especially structured and supervised clinical programmes, continuous professional developments, and accreditation and certification

[illegible]

## IAEA Survey- Status of Med Phys in Africa, June 2015



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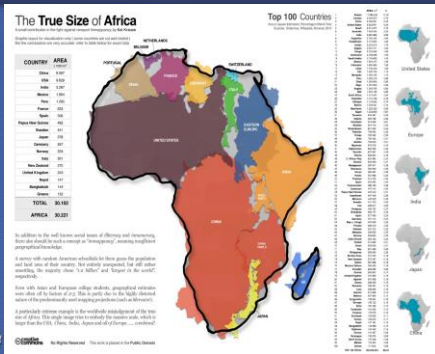
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## IAEA support to medical physics in Africa



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## IAEA support to medical physics in Africa



Countries with national projects which have a medical physics component



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Countries participating in a regional project on medical physics

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## Example of IAEA support, RAF6044

Project aiming specifically at supporting medical physics  
Duration, 2012-2016, with a total budget of 1.466.000 €

- QA/QC equipment
- Training courses
- Expert mission (commissioning, QA, etc.)



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## Dar es Salaam recommendations 2014

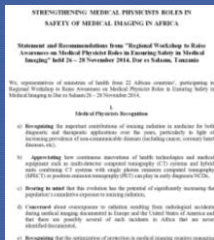
**WHO – IAEA meeting on MP in diagnostic radiology, Ministries of Health from 22 African countries**  
**Dar es Salaam recommendations 2014**

recommend that Member States:

- recognize Medical Physicists as health professionals with specialist education and training...
- establish mechanisms so that all medical imaging centres in country have access to medical physics services...
- establish posts and employ medical physicists to serve in radiology and nuclear medicine departments...



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## Federation of African Medical Physics Organisations --- FAMPO

IAEA facilitated the establishment of FAMPO through RAF/6/031- Regional TC project to support medical physics in Africa



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## IAEA support to medical physics in Latin America



Countries with a national project which includes a medical physics component



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Countries participating in regional project on medical physics

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## Example of IAEA support, RLA6072

Project aiming specifically strengthening professional skills in radiation oncology,  
Duration: 2014-2017, with a total budget of 1.381.000 €

- Training courses
- Expert mission (commissioning, QA, etc.)



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# Summary

- IAEA focuses on medical radiation physics, developing guidelines, codes of practice, education material and supporting coordinated research
- IAEA provides integrated support, mainly to low and middle income countries, for setting up new centres, upgrades, QA and audits, transitioning to new technologies, education and training
- IAEA promotes the recognition of the medical physics profession in radiation oncology and, especially in imaging for the benefit of patient care.



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H. Eisenblätter, 1971-1987



H. Svensson, 1987-1996



P. Andreo, 1995-2000  
2003-2008



K. Sörensen, 2000-2007



## Acknowledgments

Dosimetry & Medical Radiation Physics

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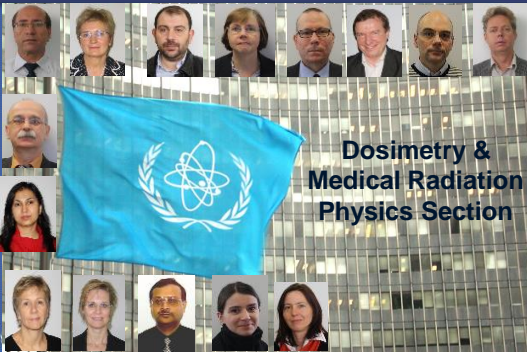
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# THANK YOU



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