



**IAEA**

*60 Years*

*Atoms for Peace and Development*

## OUTLINE OF THIS SESSION

1. Activities of the IAEA in Human health
2. The Master in Advanced Radiotherapy
3. Coordinated Research Activities (CRAs)
4. Quality Assurance Team in Radiation Oncology (QUATRO)

### **Coffee Break**

5. Directory of Radiotherapy Centers (DIRAC)
6. ALATRO Database
7. Situation of LAC according to DIRAC
8. Possibilities for collaboration

# ACTIVITIES OF THE IAEA IN THE FIELD OF HUMAN HEALTH

Pilar Murillo & Alfredo Polo  
International Atomic Energy Agency  
Vienna, Austria



# OUTLINE

1. Introduction to the IAEA
2. The Human Health Programme
3. The Technical Cooperation Programme

# IAEA, 1957: “Atoms for peace”



## IAEA objective:

*“to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world.”*



# The IAEA at a Glance

- Founded in 1957
  - 168 Member States
  - 2474 professional and support staff
  - Headquarters in Vienna
  - 2 international laboratories and research centres
  - 2 liaison offices and 2 safeguards regional offices
- 
- Approximate budget
    - Regular Budget: **€ 327 m** (33% multilateral ODA)
    - Technical Coop. Programme: **€ 118 m** (100% multilateral ODA)

# IAEA

## Main areas of work



**SAFEGUARDS AND  
VERIFICATION**



**SAFETY AND  
SECURITY**



**SCIENCE AND  
TECHNOLOGY**

“The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world”

Article II of the Statutes of IAEA

# Joint Agreement with WHO



Margaret Chan  
DG WHO

May 2009

*“**WHO** and the **IAEA** have complementary mandates when it comes to fighting cancer. WHO is the leader amongst the UN family of organizations in terms of health improvement for people, particularly in low- and middle-income countries, while the **IAEA's expertise in radiation medicine** is a vital element in cancer diagnosis and treatment”*

# IAEA

## Organizational structure



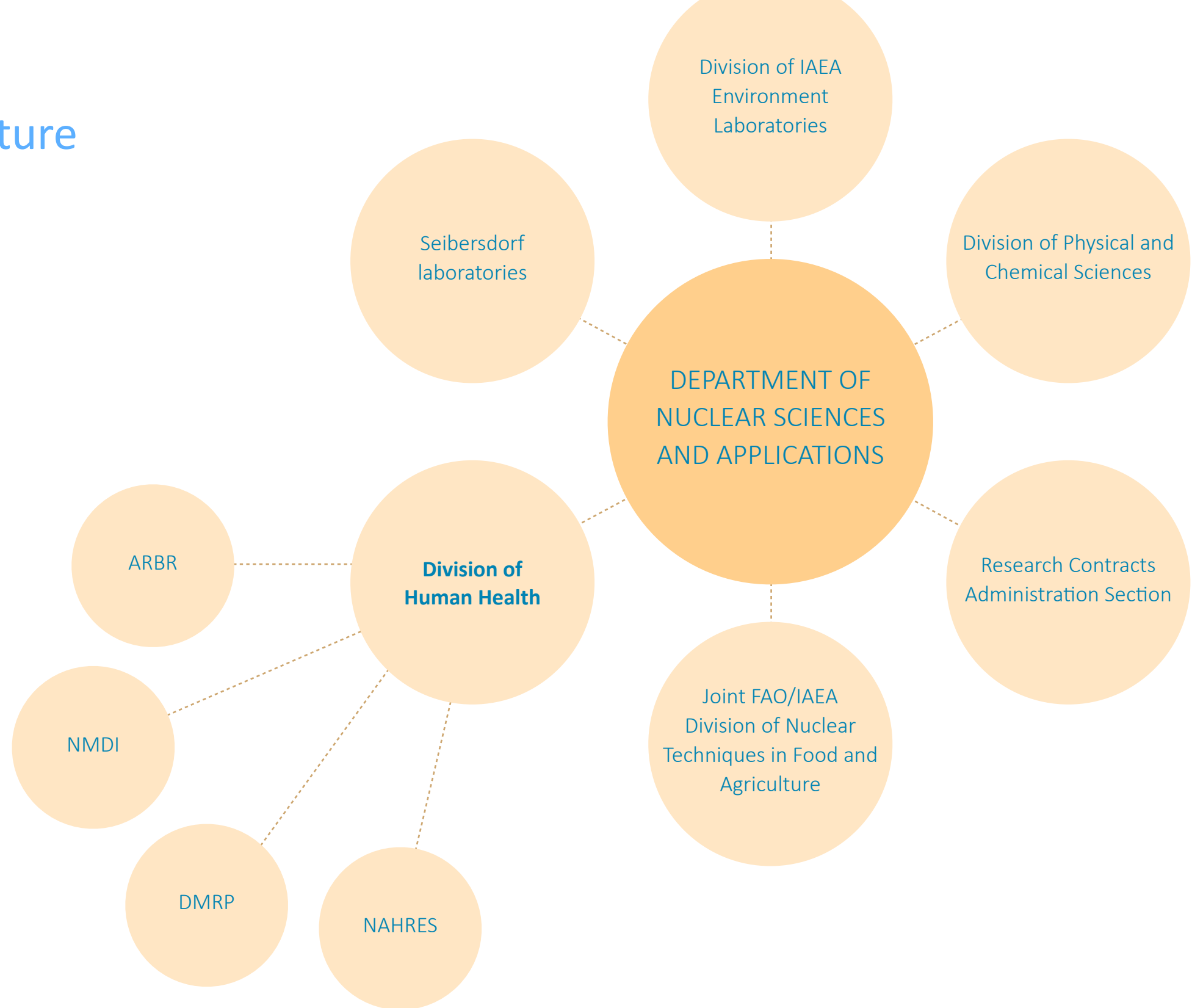
“The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world”

Article II of the Statutes of IAEA



# IAEA

## Organizational structure



# IAEA - HUMAN HEALTH

Services to Member States

COORDINATED  
RESEARCH  
ACTIVITIES

TECHNICAL  
COOPERATION  
PROGRAMME



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REVIEW  
MISSIONS

EDUCATION  
AND  
TRAINING

LABORATORY  
SERVICES

COORDINATED  
RESEARCH  
ACTIVITIES

TECHNICAL  
COOPERATION  
PROGRAMME



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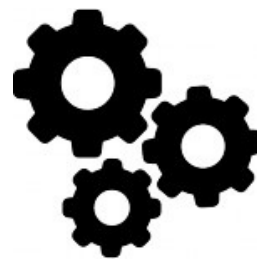
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# IAEA

## Coordinated Research Activities

The International Atomic Energy Agency (IAEA) is authorized under its Statute to encourage and assist research on atomic energy for peaceful uses throughout the world as well as on its development and practical applications. The IAEA's programme and budget for 2015 accordingly provide for the placing of research, technical and doctoral contracts and research agreements with universities, colleges, research centres, and laboratories, and other institutions in Member States on subjects directly related to the IAEA's work.





COORDINATED  
RESEARCH  
ACTIVITIES

TECHNICAL  
COOPERATION  
PROGRAMME

REVIEW  
MISSIONS



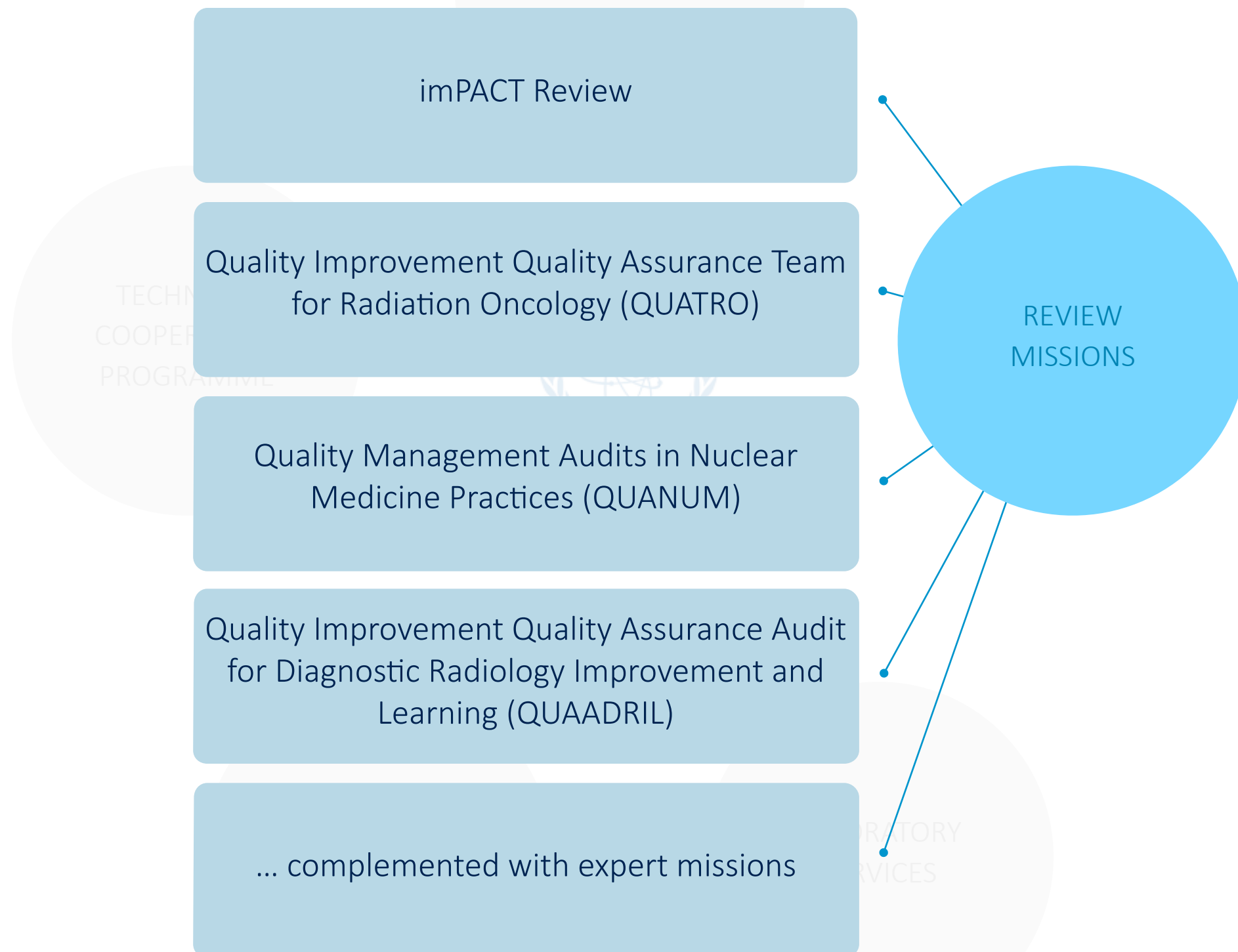
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## Review Missions related to Human Health



COORDINATED  
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### Laboratories at Monaco

Radiometrics

Radioecology

Marine  
Environmental  
Studies

Terrestrial  
Environmental  
Studies



### Laboratories at Seibersdorf (8 labs\*)

Joint FAO/IAEA  
Division  
(5 labs)

Dosimetry  
Laboratory

Nuclear Science and  
Instrumentation Lab

Terrestrial  
Environment  
Laboratory

- Dose auditing services
- Calibration facilities
- Inter-lab comparison for the SSDL

\* Plan to create a Radiobiology lab

REVIEW  
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COORDINATED  
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EDUCATION  
AND  
TRAINING

Training courses (TC)

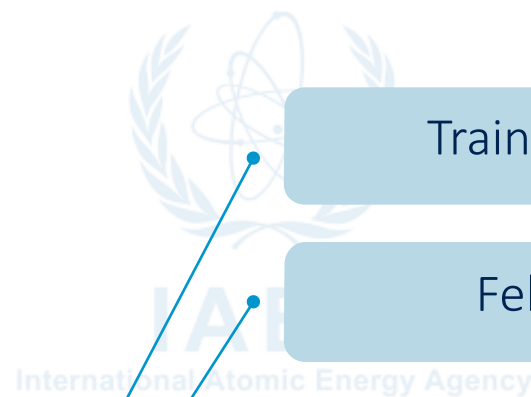
Fellowships (TC)

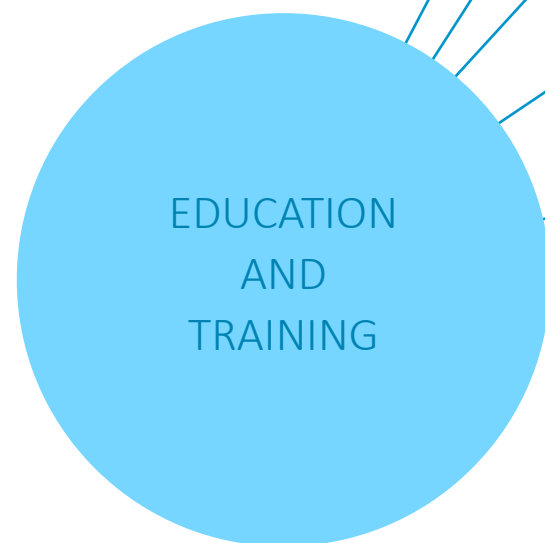
On-line learning

Sillabi

Training material

Publications





Training courses (TC)

Fellowships (TC)

On-line learning

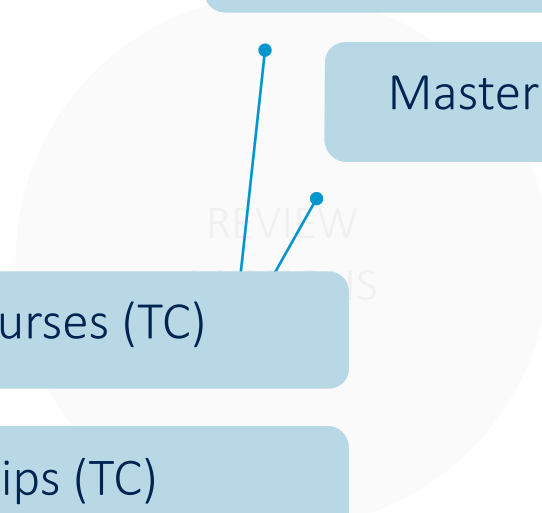
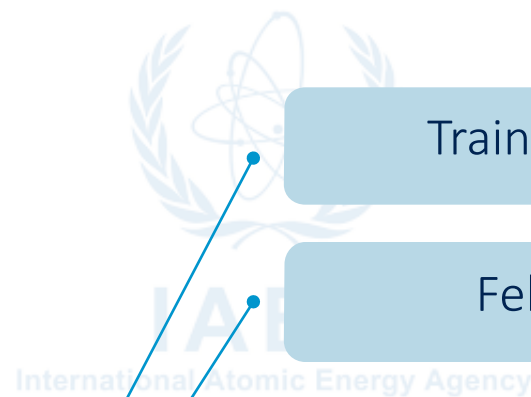
Sillabi

Training material

Publications

Master ICTP

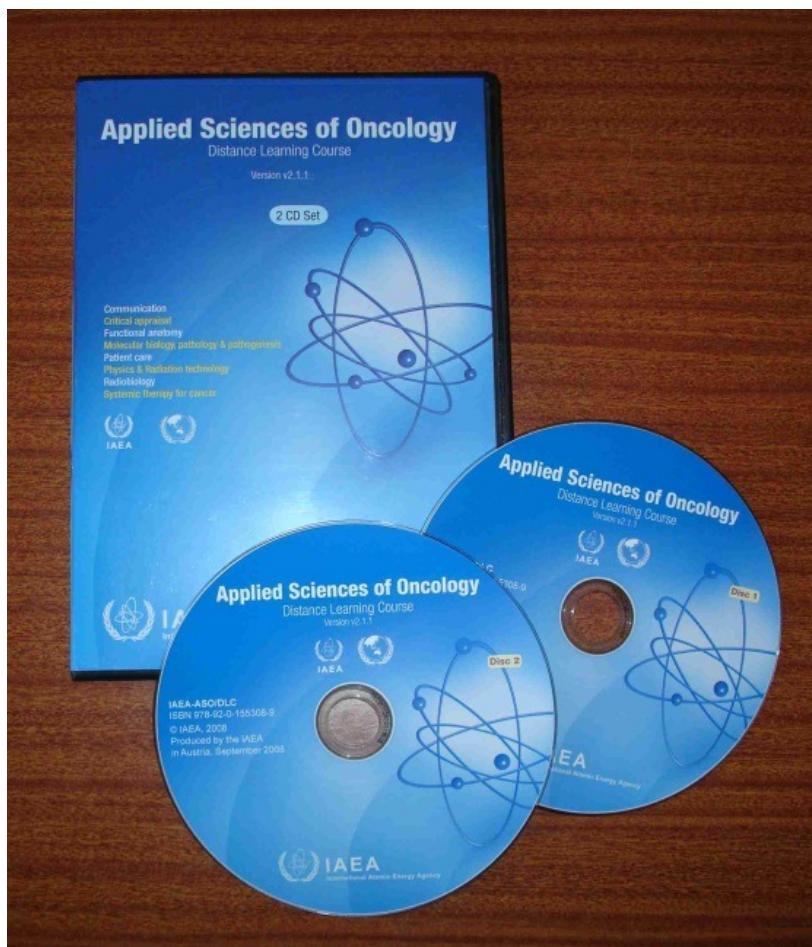
Master advanced RT



# EDUCATION AND TRAINING

## Interactive e-Learning modules

- Interactive E-learning modules that enhance the self-directed learning experience.
- Improved efficiency in education and expand educational opportunities in remote areas.



Applied Sciences of Oncology

**IAEA** International Atomic Energy Agency

**Schematic Approach to Abdominal and Pelvic Lymph Nodes**

The goal of this e-learning module is to identify and review the anatomical boundaries of abdominal and pelvic node levels

Webinars are made available at the Human Health Campus Free online educational resource for health professionals in radiation medicine that also offers a series of eLearning modules to enhance the learning experience. <http://humanhealth.iaea.org>

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**Schematic Approach to Neck Node Levels**

This is a self explanatory atlas

The goal is to identify the boundaries of anatomical neck node levels and build the atlas by yourself

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**Schematic Approach to Thoracic Lymph Nodes**

Review of the anatomy

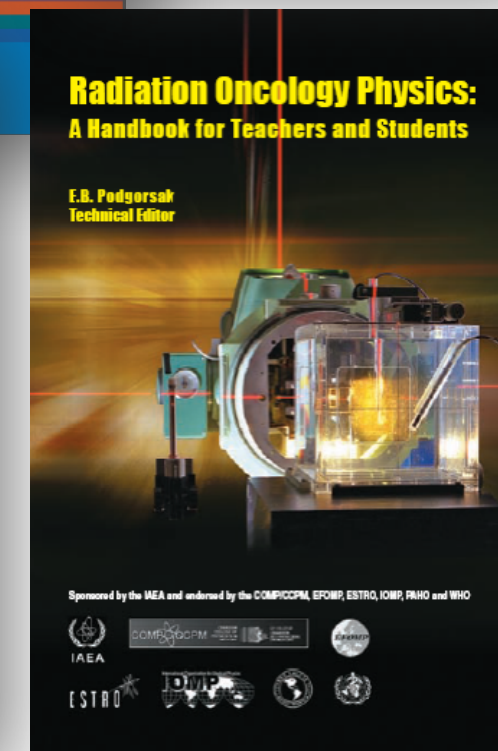
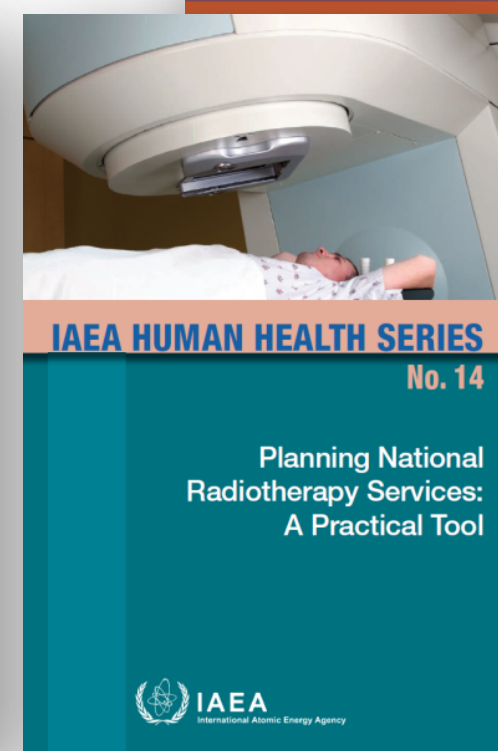
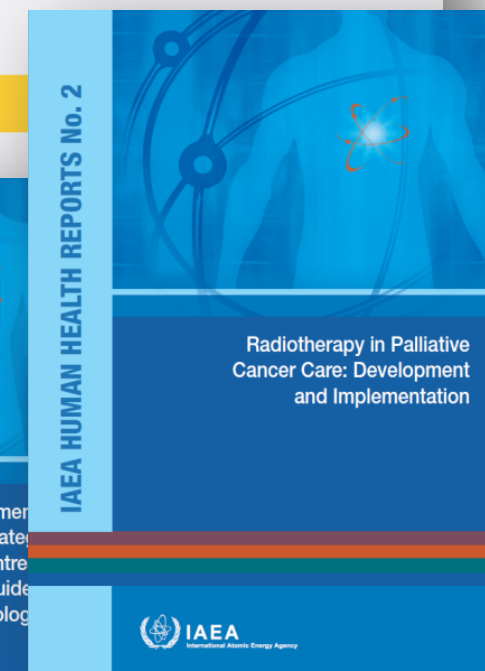
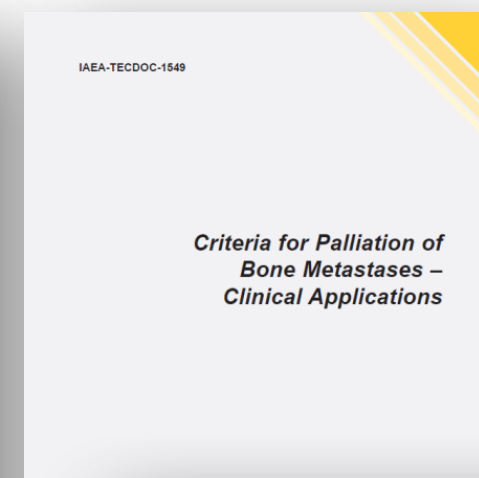
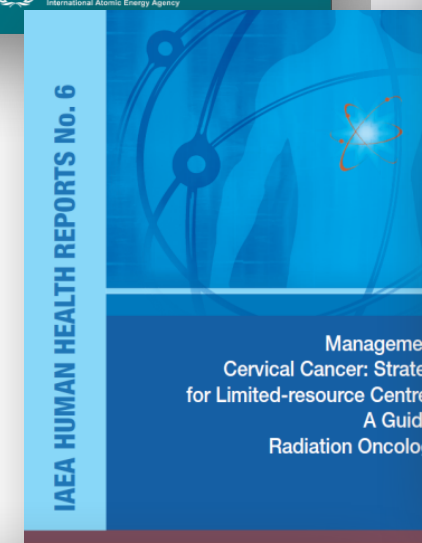
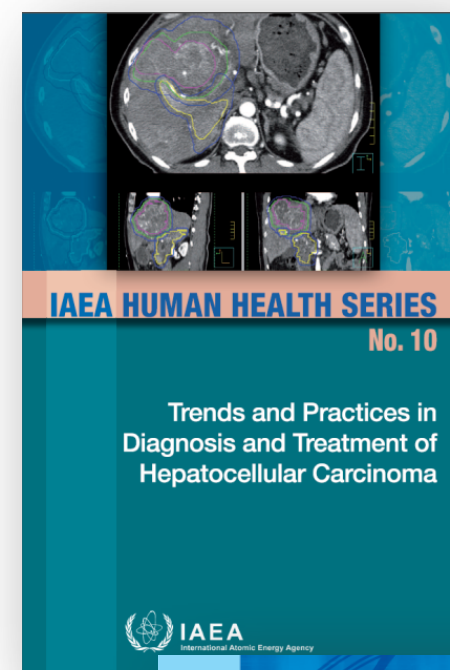
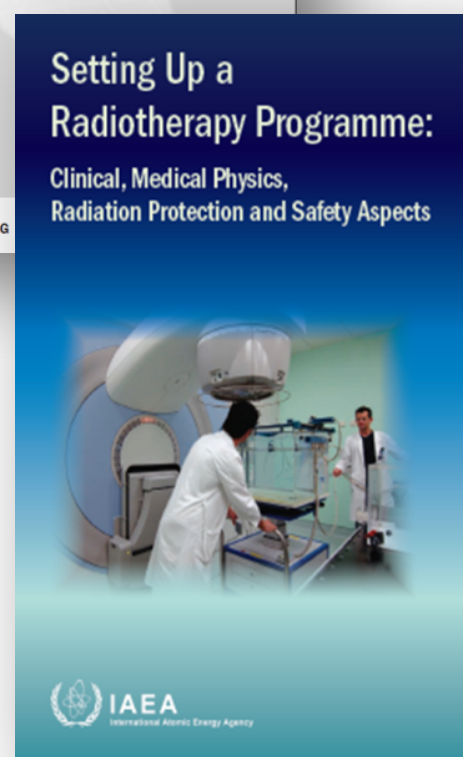
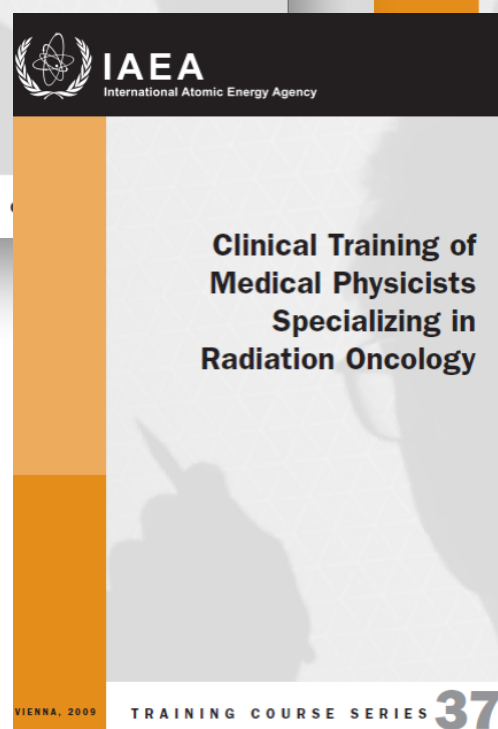
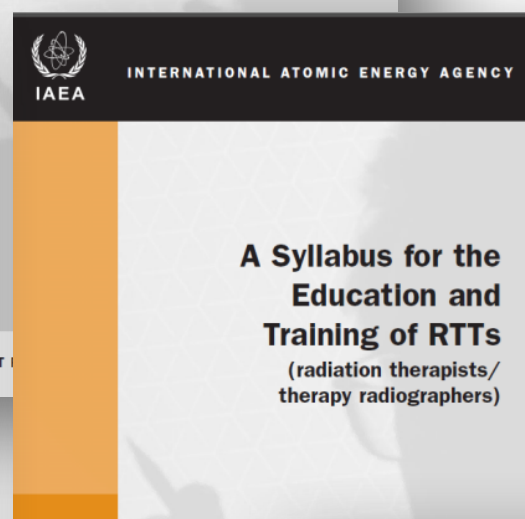
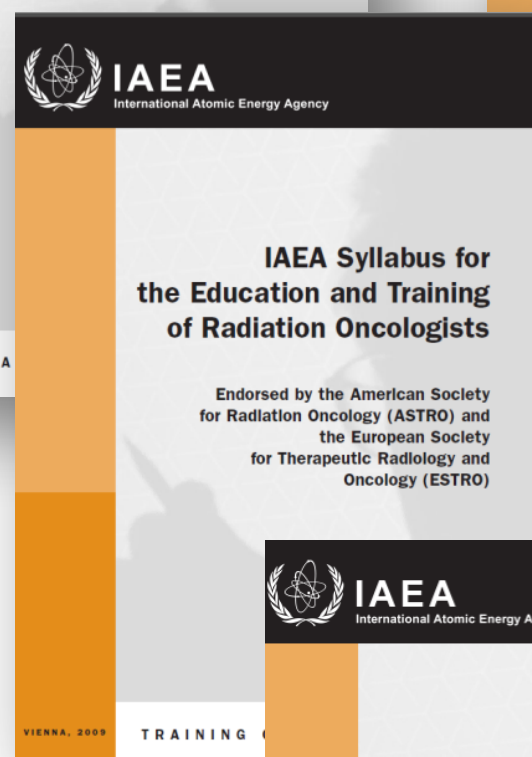
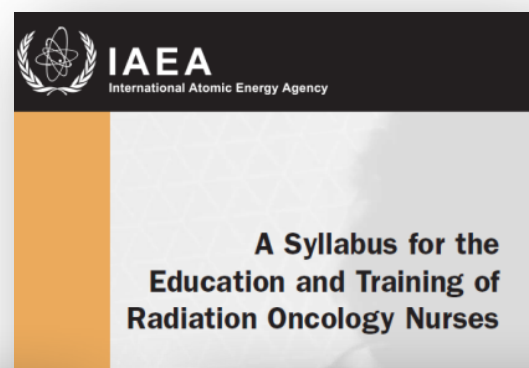
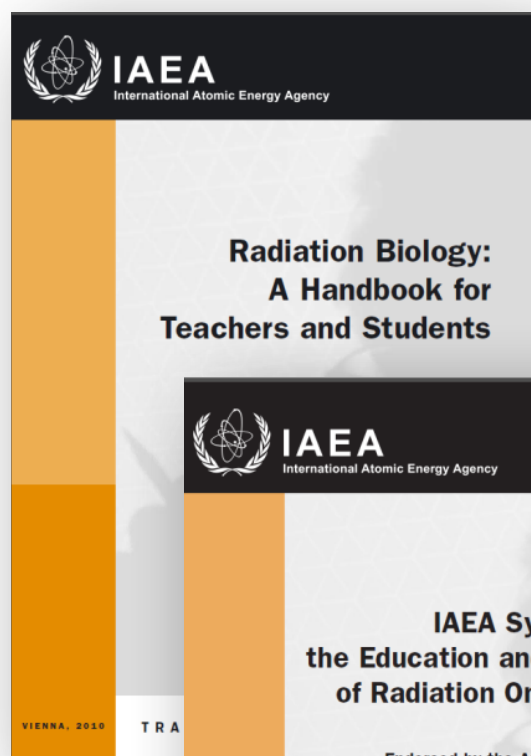
Classification

Quiz

References



# EDUCATION AND TRAINING Publications





## 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.

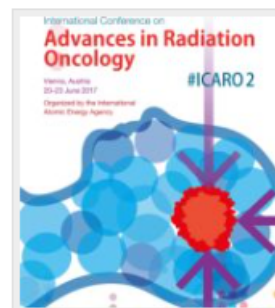
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### In the Spotlight



#### 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 States.

More information at <http://www-pub.iaea.org/iaea/meetings/50815/International-Conference-on-Advances-in-Radiation-Oncology-ICARO2>

### 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

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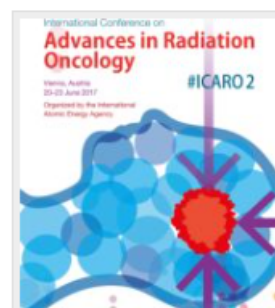
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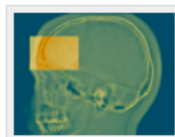
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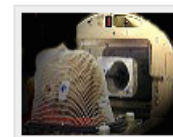
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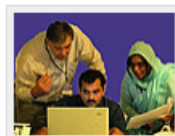
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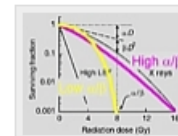
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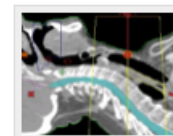
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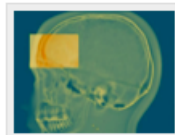
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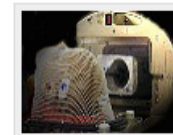
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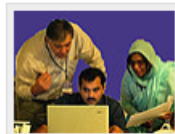
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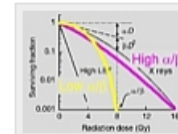
**Setting up a  
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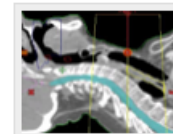
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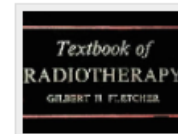
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New module



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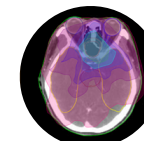
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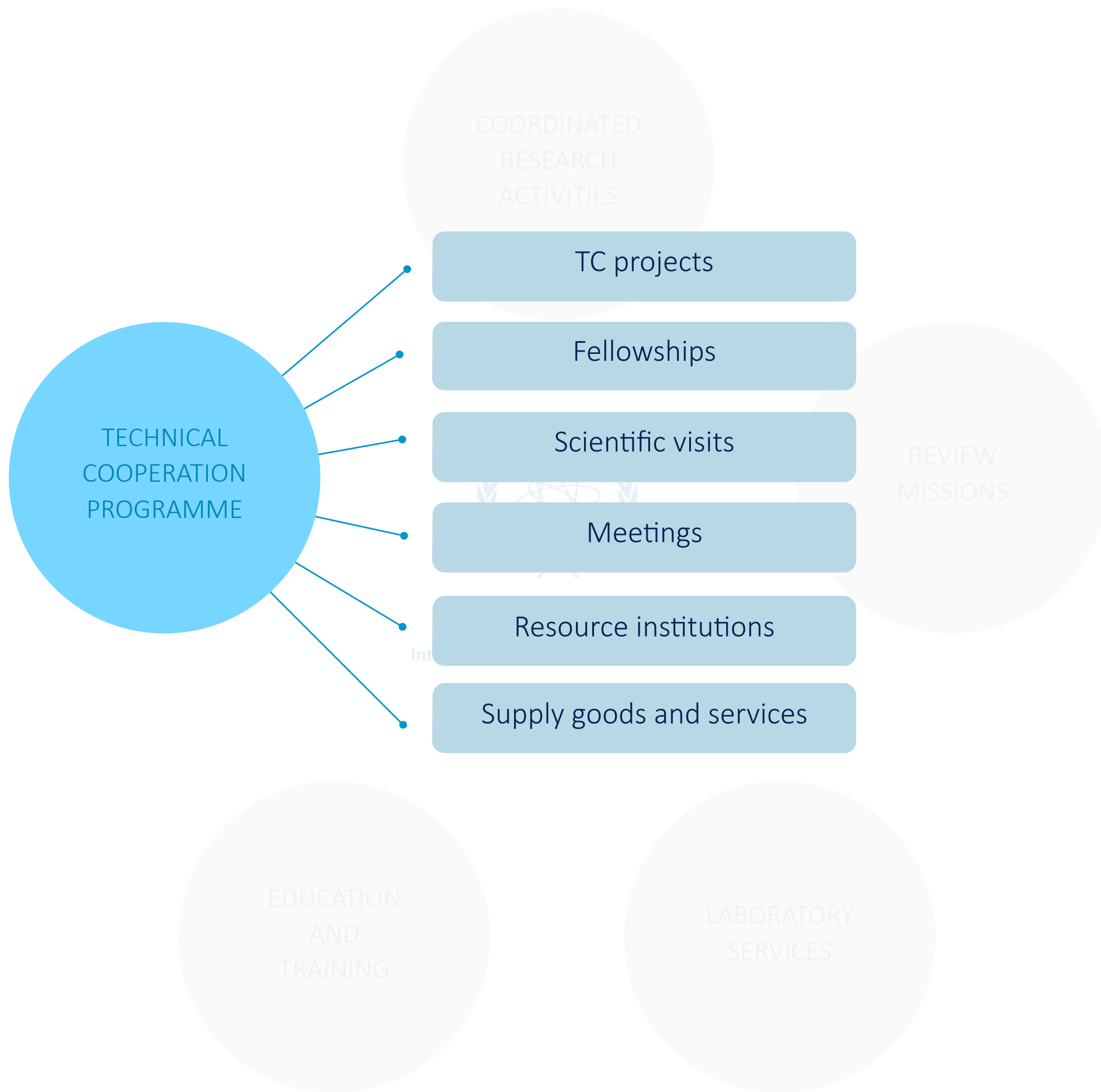


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# Overview of the IAEA Technical Cooperation Programme

**Pilar Murillo**

**Department of Technical Cooperation**



# IAEA

## Technical Cooperation Programme



“The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world”

Article II of the Statutes of IAEA



# Food and Agriculture: Helping States Increase Productivity and Quality

- **Crop Production:** Producing more with less
- **Insect Pest Control:** Protecting food, agriculture, livestock, humans and the environment
- **Livestock Production:** Achieving better health and productivity
- **Food Safety and Quality:** Focus on the food chain and standards





# Water and Environment: Helping States to Sustain Water and Other Natural Resources

- **Freshwater:** Stronger facts for water resources management
- **Oceans:** Protecting the marine environment
- **Land:** Protecting the terrestrial environment



# Industrial Radiation Treatment: Helping States Obtain Better Results in Industrial Processes

- **Flue Gases Treatment:** Cleaning the emissions of coal firing plants
- **Wastewater Treatment:** Reducing the environmental impact of chemicals
- **Sewage Sludge Treatment:** Producing fertilizer for agriculture





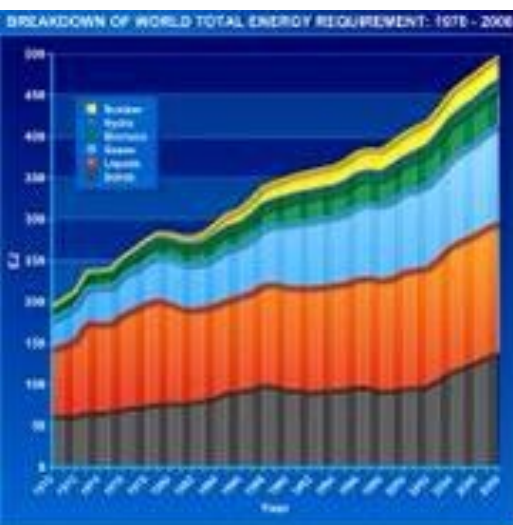
# Nuclear Safety and Security: Helping States to Protect People and the Environment

- **Regulation:** Setting safety standards and security guidance
- **Nuclear Installations:** Advancing safe and secure operations
- **Radiation and Transport Safety:** Protecting workers, patients, the public and the environment
- **Management of Disused Radioactive Sources:** Watching out for hazardous materials
- **Nuclear Security:** Upgrading capabilities, reducing global risks
- **Emergency Preparedness and Response:** Raising levels of readiness



# Nuclear Energy: Helping States Expand Their Options

- **Energy Planning:** A step by step approach
- **Energy Production:** Operation and innovation
- **Nuclear Fuel Cycle:** From mining to spent fuel
- **Radioactive Waste Management:** Guiding safe and effective implementation
- **Decommissioning and Environmental Remediation:** Cleaning up afterwards





# Human Health: Helping States Enhance Prevention, Treatment and Control of Diseases

- **Cancer:** Applying radiotherapy to cure patients
- **Cardiovascular and other Chronic Diseases:** Enhancing diagnostics
- **Malnutrition:** Finding the facts with isotopes
- **Quality Assurance in Radiation Medicine:** Protecting patients and workers





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# **Technical Cooperation Activities in Latin America and the Caribbean region in 2016**



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# TCLAC

**28**

Countries  
receiving  
TC support



Latin America and  
the Caribbean

**2016**

**138**

Fellowships  
and scientific  
visits

**737**

Expert and  
lecturer  
assignments

**€6.8m**

Total value  
of TC  
procurement

Regional  
training  
courses

**38**

**763**

Participants  
in training  
courses

**905**

Meeting participants  
and other project  
personnel

**38/43/0**

Projects closed  
in 2016/ in closure/  
cancelled

**€17.7m**

Budget allotment  
at year end

**€16m**

Encumbrances  
and actuals

**90.4%**

TCF  
implementation  
rate



## TC Supporting Areas in Latin America and the Caribbean region

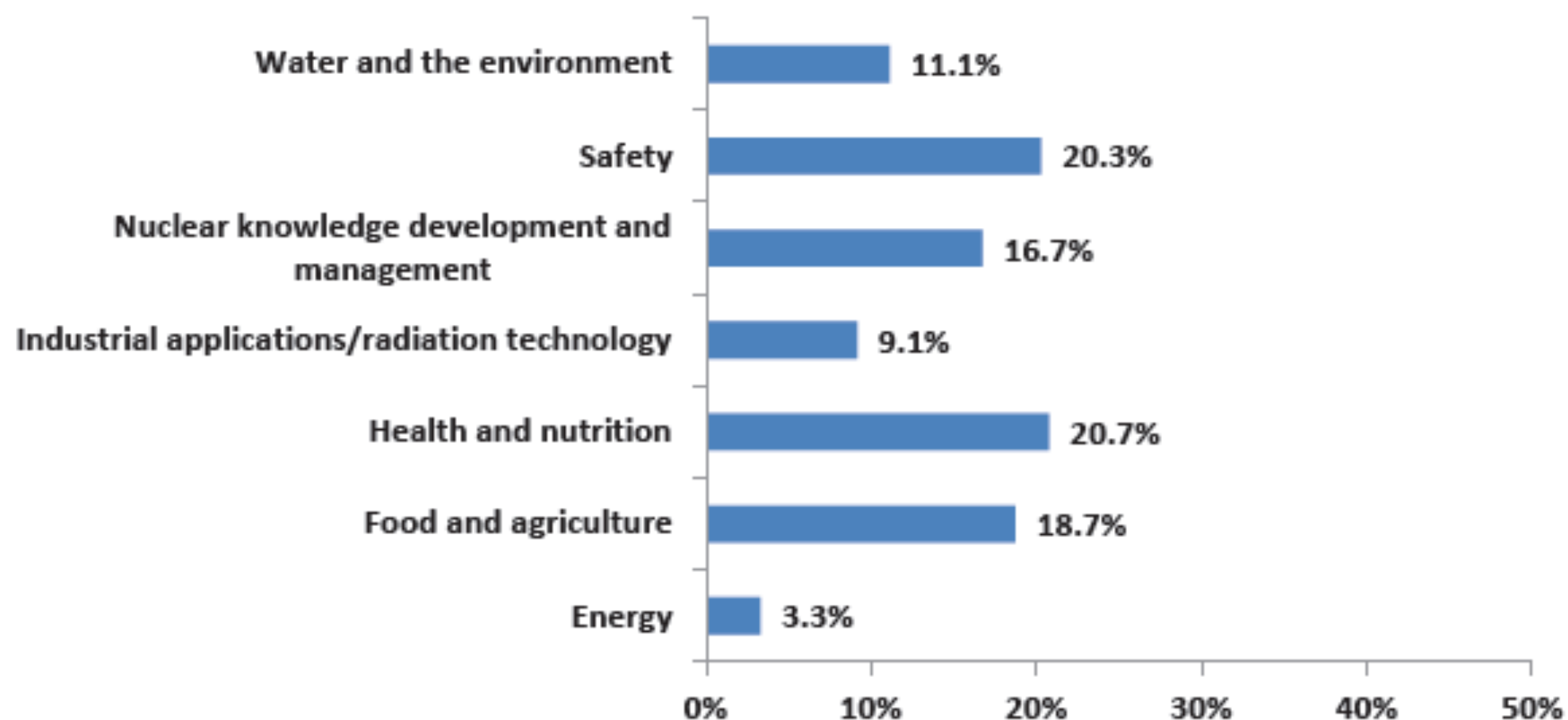


Figure 10: Actuals in the Latin America and the Caribbean region in 2016 by technical field.



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# **Technical Cooperation Activities in Latin America and the Caribbean on Human Health, during 2016**



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## Projects-Nuclear Medicine and Diagnostic Imaging (1/3)

- The Agency paid particular attention to the Zika outbreak in Latin America and the Caribbean in 2016. Altogether, seven national and three regional programme reserve projects were approved to address this outbreak.
- The projects aimed to enhance capacities to diagnose patients with the Zika virus early and fast. In addition, the Agency provided support to Ecuador in the aftermath of the terrible earthquake that occurred in April, by providing government institutions with medical and radiological equipment.
- In Uruguay, radiopharmaceutical production capacities have been improved and procedures harmonized in line with international standards through URU6037, 'Harmonizing In-Hospital Radiopharmacy to International Standards'.





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## Projects-Nuclear Medicine and Diagnostic Imaging (2/3)

- National projects in Brazil have focused on improving the delivery of nuclear medicine to patients in 2016: BRA6025, 'Supporting Technological Improvement and Human Resource Qualification in Molecular Imaging'; and BRA6028, 'Developing Human Resources for High Technology Radiotherapy and Related Safety and Quality Assurance.'
- The TC programme provided important support to the International Conference on Integrated Medical Imaging in Cardiovascular Diseases (IMIC 2016), enabling 94 participants from 59 Member States to attend this educational event.







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## Projects-Nuclear Medicine and Diagnostic Imaging (3/3)

- TC project RLA6078, 'Improving Coronary Artery Disease Patient Care with Nuclear Cardiology', was initiated in 2016.
- The Agency made significant efforts to support Jamaica within the framework of JAM6012, 'Re-Establishing Nuclear Medicine Capacity', and JAM6013, 'Promoting Healthy Growth in Children'. Several fellows were trained in nuclear medicine radiography, nuclear pharmacy and pediatric radiography.
- In Argentina, project ARG6016, 'Improving Cancer Management by Applying Positron Emission Tomography Radiotracers for Staging, Treatment, Response Assessment and Radiotherapy Planning', aims to strengthen the capacities of the Nuclear Medicine School Foundation (FUESMEN) in the Province of Mendoza.
- In Uruguay, the Agency helped the country to establish a new centre for diagnostic and therapeutic nuclear medicine, located in the middle of the country. With the support of project URU6035, 'Developing the First Regional Nuclear Medicine Centre to Provide Diagnostic and Therapeutic Procedures to the Northern and Central Regions', capacities



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## Projects-Radiation Technology

- Cuba has been able to license a national facility for the production of pharmaceutical grade Mo 99/99mTc generators with the support of TC project CUB6023, 'Enhancing the Production and Use of 99Mo/99mTc Generators through Compliance with Good Manufacturing Practice and Quality Management Requirements', which was finalized in 2016.
- Peru, with Agency support, established a tissue bank at the Child's Health Institute in 1996, and has continued to benefit from training courses, expert missions, scientific visits and equipment. Tissue engineering skills using radiation technology, developed under PER6017, 'Improving National Capabilities to Treat Patients with Burns, Lesions and Polytraumatized Conditions
- The Peruvian Institute of Nuclear Energy and the Child's Health Institute of San Borja are planning to collaborate with universities to teach these new techniques.





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## Projects-Dosimetry and Medical Physics

- Two training courses designed to build capacity in medical physics were carried out in 2016 under RLA6072, 'Supporting Capacity Building of Human Resources for a Comprehensive Approach to Radiation Therapy (ARCAL CXXXIV)'.
- Twenty-three medical physicists from 14 different countries in the Latin America and Caribbean region were trained in Argentina on Quality Assurance in Image Guided Radiotherapy, receiving theoretical knowledge and hands-on training with a focus on the effective application of radiotherapy and enhanced treatment precision and quality assurance procedures.





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## Projects-Radiation Oncology

- In the Latin American and the Caribbean region, efforts continued throughout 2016 to improve the quality of radiation therapy through the ARCAL project RLA6072, 'Supporting Capacity Building of Human Resources for a Comprehensive Approach to Radiation Therapy (ARCAL CXXXIV)'.
- The Agency is supporting Guatemala in the establishment of a HDR brachytherapy programme for gynaecological tumours in the National Cancer Institute and Hospital Dr. Bernardo del Valle under GUA6020, 'Establishing a High Dose Rate Brachytherapy Programme for Gynaecological Tumours'.
- In Nicaragua, significant effort in 2016 went into building capacities in cancer radiation treatment. Advice on the introduction and installation of new technologies was provided to the country through TC project NIC6019, 'Building Capacity in Cancer Radiation Treatment'. Support focused on providing training for the safe, effective use of the technology within a quality assurance framework.



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*Thank you!*

