Curso regional de técnicas avanzadas de imágenes diagnósticas en cardiopatía dilatada y el papel de la medicina nuclear en la evaluación de la enfermedad de Chagas
IAEA initiatives in nuclear medicine/cardiology & objectives of the Training Course

Diana Paez
Section of Nuclear Medicine and Diagnostic Imaging
Division of Human Health
Outline of the Presentation

- IAEA
- Division of Human Health
- Nuclear Medicine & Diagnostic Imaging Section
- Nuclear cardiology activities
- Objectives of current Expert Meeting

- Who we are
- What we do
- How we deliver
The atomic energy agency could be made responsible for the impounding, storage and protection of the contributed fissionable and other materials. The ingenuity of our scientists will provide special safe conditions under which such a bank of fissionable material can be made essentially immune to surprise seizure. The more important responsibility of this atomic energy agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world.

"Atoms for Peace" was the title of a speech delivered by U.S. President Dwight D. Eisenhower to the UN General Assembly in New York City on December 8, 1953.
“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*
The following States are Members of the International Atomic Energy Agency:

AFGHANISTAN  ALBANIA  ALGERIA  ANGOLA  ARGENTINA  ARMENIA  AUSTRALIA  AUSTRIA  AZERBAIJAN  BANGLADESH  BELARUS  BELGIUM  BELIZE  BENIN  BOLIVIA  BOSNIA AND HERZEGOVINA  BOTSWANA  BRAZIL  BULGARIA  BURKINA FASO  CAMEROON  CANADA  CENTRAL AFRICAN REPUBLIC  CHAD  CHEF  CHINA  COLOMBIA  COSTA RICA  CÔTE D’IVOIRE  CROATIA  CUBA  CYPRUS  CZECH REPUBLIC  DEMOCRATIC REPUBLIC OF THE CONGO  DENMARK  DOMINICAN REPUBLIC  ECUADOR  EGYPT  EL SALVADOR  ERITREA  ESTONIA  ETHIOPIA  FINLAND  FRANCE  GABON  GEORGIA  GERMANY  GHANA  GREECE  GUATEMALA  HAITI  HOLY SEE  HONDURAS  HUNGARY  ICELAND  INDIA  INDONESIA  IRAN, ISLAMIC REPUBLIC OF  IRAQ  IRELAND  ISRAEL  ITALY  JAMAICA  JAPAN  JORDAN  KAZAKHSTAN  KENYA  KOREA, REPUBLIC OF  KUWAIT  KYRGYZSTAN  LATVIA  LEBANON  LIBERIA  LIBYAN ARAB JAMAHIRIYA  LIECHTENSTEIN  LITHUANIA  LUXEMBOURG  MADAGASCAR  MALAWI  MALAYSIA  MALI  MALTA  MARSHALL ISLANDS  MAURITANIA  MAURITIUS  MEXICO  MONACO  MONGOLIA  MONTENEGRO  MOROCCO  MOZAMBIQUE  MYANMAR  NAMIBIA  NEPAL  NETHERLANDS  NEW ZEALAND  NICARAGUA  NIGER  NIGERIA  NORWAY  PAKISTAN  PALAU  PANAMA  PARAGUAY  PERU  PHILIPPINES  POLAND  PORTUGAL  QATAR  REPUBLIC OF MOLDOVA  ROMANIA  RUSSIAN FEDERATION  SAUDI ARABIA  SENEGAL  SERBIA  SEYCHELLES  SIERRA LEONE  SINGAPORE  SLOVAKIA  SLOVENIA  SOUTH AFRICA  SPAIN  SRI LANKA  SUDAN  SWEDEN  SWITZERLAND  SYRIAN ARAB REPUBLIC  TAJIKISTAN  THAILAND  THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA  TUNISIA  TURKEY  UGANDA  UKRAINE  UNITED ARAB EMIRATES  UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND  UNITED REPUBLIC OF TANZANIA  UNITED STATES OF AMERICA  URUGUAY  UZBEKISTAN  VENEZUELA  VIETNAM  YEMEN  ZAMBIA  ZIMBABWE

The Agency’s Statute was approved on 23 October 1956 by the Conference on the Statute of the IAEA held at United Nations Headquarters, New York; it entered into force on 29 July 1957. The Headquarters of the Agency are situated in Vienna. Its principal objective is “to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world.”
What exactly does the IAEA do?

**Mission:** Maximizing the contribution of nuclear technology to society, while verifying its peaceful use

**Three pillars:**

- **Safeguards & verification:**
  - Verifies through its inspection system that States comply with their commitments, under the Non-Proliferation Treaty and other non-proliferation agreements, to use nuclear material and facilities only for peaceful purposes.

- **Safety & security:**
  - Develops nuclear safety standards and, based on these standards, promotes the achievement and maintenance of high levels of safety in nuclear energy, as well as the protection of human health and the environment against ionizing radiation;

- **Assists its MS:**
  - Assists its MS, in the context of social and economic goals, in planning for and using nuclear science and technology for various peaceful purposes, including the generation of electricity, and facilitates the transfer of such technology and knowledge in a sustainable manner to developing MS.
### IAEA Organization Chart

[IAEA Organization chart image]

#### IAEA Organizational Chart

<table>
<thead>
<tr>
<th>DIRECTOR GENERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretariat of the Policy-Making Organs</td>
</tr>
<tr>
<td>Office of External Relations and Policy Coordination</td>
</tr>
<tr>
<td>Office of Internal Oversight Services</td>
</tr>
<tr>
<td>Office of Legal Affairs</td>
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</tbody>
</table>

#### Department of Technical Cooperation

- Africa, and East Asia and the Pacific
- Europe, Latin America and West Asia
- Planning and Coordination

#### Department of Nuclear Energy

- Nuclear Power
- Nuclear Fuel Cycle and Waste Technology

#### Department of Nuclear Safety & Security

- Nuclear Installation Safety
- Radiation and Waste Safety

#### Department of Management

- Budget and Finance
- Conference and Document Services

#### Department of Nuclear Sciences & Applications

- International Centre for Theoretical Physics (ICTP)
- Agency’s Laboratories
- IAEA Marine Environment Laboratory, Monaco

#### Department of Safeguards

- Operations A
- Operations B
- Operations C

#### Support Services

- General Services
- Information Technology
- Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture
- Safeguards Information Technology
- Personnel
- Public Information
- Physical and Chemical Sciences
- Technical Support
Objective: to enhance the capabilities in Member States to address needs related to the prevention, diagnosis and treatment of health problems through the application of nuclear techniques:

- **NMDI** (Nuclear Medicine & Diagnostic Imaging Section)
- **ARBR** (Applied Radiation Biology & Radiotherapy Section)
- **DMRP** (Dosimetry & Medical Radiation Physics Section)
- **NAHRES** (Nutrition & Health related Environmental Studies Section)
WHO’s world health report for 2008

- Urbanization, ageing and globalized lifestyle changes combine to make chronic and non-communicable diseases – including depression, diabetes, cardiovascular disease and cancers – and injuries increasingly important causes of morbidity and mortality.

- There is a striking shift in distribution of death and disease from younger to older ages and from infectious, perinatal and maternal causes to non-communicable diseases.
Figure 1.8 The shift towards noncommunicable diseases and accidents as causes of death*

Deaths (millions)

Road-traffic accidents
Cerebrovascular diseases
Ischaemic heart diseases
Cancers
Perinatal causes
Acute respiratory infections
Diarrhoeal diseases
Malaria
HIV/AIDS
Tuberculosis

* Selected causes.
how we work

capacity building of ms

• education
• advice
• awareness
• human resource development
• coordinated research (crp)

programmatic activities (regular budget)

• technology transfer

technical cooperation
Educational Initiatives of
Nuclear Medicine & Diagnostic Imaging Section

How we deliver

- Consultant Meetings/ Technical Meetings
- Coordinated Research Projects (CRPs)
- International Symposia/Conferences
- Educational Resources
• **Goal:**
  
  Capacity building in MS to accept, use & update knowledge about modern technology & its quality.

• **To achieve goal:**
  
  National training course  
  Regional training course  
  Expert missions  
  Fellowship / Scientific visits  
  Publications  
  Human Health Campus  
  Distance Assisted Training
Major activities in Nuclear Medicine and Diagnostic Imaging

Mission: To enhance capabilities of Member States in Nuclear Medicine & Diagnostic Imaging through enhancing safety and quality of practice

Managing of chronic diseases with integrated diagnostic imaging modalities emphasizing infectious, cardiovascular and cancer

Cost-effective use of radiopharmaceuticals in therapy, neurology and paediatric diseases

Quality management in professional education and clinical practice
Awareness

Publications – Web based

IAEA Publications, Documents & Reports

Scientific & Technical Publications

The IAEA is a leading publisher in the nuclear field. Its scientific and technical publications cover fifteen subject areas. They include proceedings of major international conferences as well as international guidelines, codes, and standards. Publications pages.

International Standards, Guides & Codes

A big part of the IAEA’s mandate is to set and promote the application of standards for protecting people and the environment from harmful radiation effects. Standards are published in five key areas.

IAEA Reports & Reviews

Each year, the IAEA reports on developments in the nuclear world, in the context of its major activities and plans.

IAEA Documents & Conventions

Many of the IAEA’s official documents are issued for public distribution. They include key international conventions and legal agreements, communications with Member States (INFIRCIS), and General Conference policy and programmatic documents.

Magazines, Journals & Newsletters

The IAEA publishes a range of periodicals in print and electronic formats. They highlight and report on nuclear issues and developments, and update work through Agency-supported projects and programmes.

http://www.iaea.org/Publications/index.html
Nuclear Cardiology

- Standard of practice in cancer management in the last decade
- Role of Nuclear Cardiology
- Supporting activities and projects focused on implementing and strengthening nuclear cardiology
After 100 years from the discovery of X-rays and half a century from the initial applications of radiotracers, nuclear medicine has become an integral part of medical practice. As the scope of imaging has broadened from anatomy to metabolism and function, and potential applications are increasingly expanding, virtually very few diagnoses can be made without the need of at least the simplest imaging procedure. Through case studies,
Nuclear Cardiology is a well-established technique to assess myocardial perfusion and ventricular function, and its role as a non-invasive methodology for the characterization of a variety of cardiac conditions, especially coronary artery disease (CAD) has been extensively evaluated and validated in clinical practice. Nuclear cardiology uses the so-called emission tomography imaging method (single-photon emission computed tomography or SPECT, and more recently positron emission tomography or PET) which renders three-dimensional images depicting the distribution of a radioactive compound in the heart which was previously administered intravenously at rest or during a stress test. Nuclear cardiology is one of the most commonly used procedures for detecting and determining the severity of CAD. It is sensitive, accurate, and cost-effective, and gives excellent prognostic information that is not provided by other diagnostic modalities, useful for patient management based on risk stratification.

Pulmonary scintigraphy is extensively used for the evaluation of lung perfusion and ventilation, and has a principal role in the diagnosis of pulmonary embolism (PE). Despite recent advances in other imaging modalities such as CT pulmonary angiography, the radionuclide technique is considered to have superior sensitivity although with
From Desktop to Mobile Technology

- Expand Learning Opportunities
- Platform for future real time M-Learning
- Lifelong learning experience
Nuclear Cardiology

Nuclear Cardiology: Its Role in Cost Effective Care

Nuclear Cardiology: Guidance and Recommendations for Implementation in Developing Countries
1990-1994  Project formulation and funding (AusAID / IAEA / RCA)
1994-1997  Development and pilot testing - Phase 1 *(basic)*
1999      IAEA Inter-regional project established *(Asia, Africa, Latin America)*
1999-2002 Development and pilot testing – Phase 2 *(advanced)*
           Implementation of training program
2003-2004 Editing and extension of materials (IAEA)
2005      IAEA international review and editing
2007-2010 Development SPECT/CT, PET/CT *(DAT Part 2)*
           Phase 3  - Development of website delivery - Pilot
Coordinated Research

- Technology transfer (new procedures/techniques implemented)

- Share of knowledge (scientists from developed/developing countries working together)

- Contributes towards the greater understanding or solution of a specific issue or problem

- Contributes to the wider objectives which have been set for the relevant Agency Programme or Project
Current CRPs

Cardiology

Assessment of LVEF in CAD by G-SPECT

Rest MPI in acute chest pain

MPI in asymptomatic diabetes

Myocardial SPECT imaging and CTA in CAD
NEW Educational Initiatives of Nuclear Medicine & Diagnostic Imaging Section

- Webinar
  - Web base seminar
  - In comfort of your hospital or home
  - No need to travel
  - Structure interactive training
  - No cost to participant
  - Through a partnership of IAEA and SNM
COMPLIMENTARY WEBINAR:
10 CT Cases of the Thorax, Abdomen, and Pelvis

August 21, 2012 | 9:00pm PDT*

IAEA and SNMMI bring you a free webinar designed to increase Nuclear Medicine physicians’ knowledge of cross sectional anatomy. Sundeep Nayak, MD, Adjunct Professor of Radiology at the University of California, San Francisco will review 10 CT cases of the thorax, abdomen and pelvis to increase interpretive skills when CT is performed in conjunction with PET and SPECT.

Normal anatomy and common pathological findings will be reviewed in a live, interactive case-based format that simulates clinical practice. Participants will be asked one question after each presentation using an audience response system that allows participants to evaluate their knowledge and diagnostic skills compared to their peers.

Register for this complimentary webinar & check corresponding date and time in your country: www.snmmi.org/iaeaweb

Learning Objectives:
- Understand normal cross sectional anatomy and common variants
- Recognize common pathological findings
- Increase interpretative skill when reading CT performed in conjunction with PET and SPECT

✓ No international calling fees
✓ Check corresponding date and time of webinar in your country*
✓ Limited registration available
✓ View a sneak preview at www.snmmi.org/iaeaweb

Offered as part of a joint educational series between:

IAEA

Society of Nuclear Medicine and Molecular Imaging
Attendance according to Time zones
Enhancing Quality of Practice

Quality Management Audits in Nuclear Medicine Practices

Comprehensive Audits of Diagnostic Radiology Practices: A Tool for Quality Improvement

QA: one of the major projects of NAHU
Outreach

International Conference on

Clinical PET and Molecular Nuclear Medicine (IPET 2011)

8–11 November 2011
Vienna, Austria

Organized by the International Atomic Energy Agency

350 participants
79 MSs

International Conference on
Integrated Medical Imaging in Cardiovascular Diseases (IMIC 2013)

30 September - 4 October 2013
Vienna International Centre
Vienna, Austria

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Organized by the International Atomic Energy Agency
Technical Cooperation Program
NMS

Cycle 2009-11
48 National
8 Regional

Cycle 2012-13
19 National
7 Regional

= 67 Nat.
15 Reg.
National Projects Cardiology

Afghanistan, Algeria, Benin, Bosnia and Herzegovina, Ecuador, Estonia, Macedonia, Morocco, Namibia, Nicaragua, Niger, Oman, Republic of the Congo, Slovenia, Zimbabwe, Venezuela, Paraguay
Summary

- Objective is Capacity building
- Based on education principles
- Need based
- Complete development versus Skill enhancement
Sub-regional Meeting on the appropriate use of nuclear cardiology in dilated cardiomyopathy, with emphasis on Chagas disease.

Standardization of protocols and clinical applications
“Armonización de las técnicas de cardiología nuclear para tratar a los pacientes que sufren de insuficiencia cardíaca congestiva, haciendo énfasis en la cardiomiopatía de Chagas”
Objetivos del curso:

- Mejorar el conocimiento sobre las técnicas diagnósticas de imagen disponibles para la evaluación de pacientes con falla cardíaca (FC), cardiomiopatía dilatada (CMD) y enfermedad de Chagas (EC), con énfasis en las técnicas de medicina nuclear.

- Contar con profesionales debidamente capacitados que puedan difundir los conocimientos adquiridos y establecer los procedimientos en sus respectivos centros/países para de esta manera mejorar la atención de los pacientes.
Curso regional en cardiología nuclear: “Tecnología y técnicas para tecnólogos en medicina nuclear”

Arequipa, Perú - 11 a 15 de Marzo de 2013