Project RAS6/063

Strengthening the Application of Nuclear Medicine in the Management of Cardiovascular Diseases
Regional Training Course on “Imaging in ischemic heart disease and cardiac failure”

IAEA activities in Nuclear Medicine and Nuclear Cardiology

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Mission

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

Three pillars:
- Safeguards & verification
- Safety & security
- Science & technology
The Norwegian Nobel Committee has decided that the Nobel Peace Prize for 2005 is to be shared, in two equal parts, between the International Atomic Energy Agency (IAEA) and its Director General, Mohamed ElBaradei, for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way.

Presentation Speech by Professor Ole Danbolt Mjøs, Chairman of the Norwegian Nobel Committee
Oslo, December 10, 2005.
"I am trying to change the widespread perception of the Agency as simply the world’s ‘nuclear watchdog’ because it does not do justice to our extensive activities in other areas, especially in nuclear energy, nuclear applications, and technical cooperation."

Yukiya Amano
Director General
IAEA
Scientific Forum 2010
NUCLEAR APPLICATIONS IN HEALTH
A UNIQUE MANDATE OF THE IAEA

“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 Nobel Peace Prize to International Atomic Energy Agency (IAEA) "for their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way". 2005
Department of Nuclear Sciences and Applications

Contributing to sustainable development through the use of nuclear sciences and their applications

Programmes in:
- food and agriculture (with FAO)
- human health
- industry
- water resource management
- protection of marine and terrestrial environment
- Special programme: PACT
Department of Technical Cooperation

Transferring nuclear and related technologies for peaceful uses to countries throughout the world

- **Goal:** contributing directly to sustainable development priorities
- **How?** provide skills and equipment
- **Who benefits?** 154 recipient countries in 2012
- **When?** When nuclear technology is a better or complementary solution
The Technical Cooperation Program

- Technical Cooperation Program is aimed at knowledge and technology transfer to MSs.

- Projects in Human Health accounts for more than 25% of the total TC budget.

- Total budget allocated to support NM projects worldwide exceeds 3.5 Mil USD/year.
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:

- NMS (Nuclear Medicine and Diagnostic Imaging)
- ARBR (Applied Radiobiology and Radiotherapy)
- DMRP (Dosimetry and Medical Radiation Physics)
- NAHRES (Nutritional and Health-related Environmental Studies)
Nuclear Medicine Section

• Specific mission of fostering the application of nuclear medicine techniques as part of the clinical management of certain types of diseases.

• Enhancing Member States’ capability to address health needs by the use of Nuclear Medicine techniques in both imaging and therapeutic applications, complementary to conventional techniques.
Three Major Projects

• 2.2.2.1: Managing chronic diseases with integrated diagnostic imaging modalities emphasizing, infectious, cardiovascular diseases and cancer. (including basic aspects of MRI and CT)

• 2.2.2.2: Cost effective use of radiopharmaceuticals in therapy, neurology and paediatric diseases).

• Project 2.2.2.3: Quality management in professional education and clinical practice.
Activities

1. Programmatic activities (Regular Budget)
   - Coordinated Research (CRPs)
   - Consultant Meetings/ Technical Meetings
   - International Symposia/Conferences
   - Educational Resources
     - Publications
     - Website

2. Support to the Technical Cooperation (TC) Program
Coordinated Research

- Share of knowledge (scientists from developed/developing countries working together)
- Technology transfer (new procedures/techniques implemented)
- Contributes to the wider objectives which have been set for the relevant Agency Programme or Project
Current CRPs

1. **Nuclear Cardiology:**
   i. Assessment of LVEF in CAD by G-SPECT
   ii. Rest MPI in acute chest pain
   iii. MPI in asymptomatic diabetes
   iv. Myocardial SPECT imaging and CTA in CAD

2. **Oncology:**
   i. FDG-PET in Lymphoma
   ii. Targeted radiolabelled peptides for the diagnosis and treatment of solid tumours
   iii. SLND in breast, melanoma and head & neck cancers
   iv. Lu-177 EDTMP for bone pain palliation in metastatic disease

3. **Others:**
   i. SPECT/CT in longitudinal follow up of complicated bone infections
Publications – Nuclear Cardiology


http://www-pub.iaea.org/books/IAEABooks/8601/Nuclear-Cardiology-Its-Role-in-Cost-Effective-Care
International Symposium on Cardiovascular Nuclear Medicine
Beijing, China
27 - 31 May 2002

International Symposium on Nuclear Oncology (ISNO-2004)
19 - 23 January 2004
Porto Alegre, Brazil

International Conference on Quality Assurance and New Techniques in Radiation Medicine
13 - 15 November 2006

International Conference on Clinical PET and Molecular Medicine (IPET 2007)
Bangkok, Thailand
10-14 November 2007

International Conference on Clinical PET and Molecular Nuclear Medicine (IPET-II-2011) - Trends in Clinical PET and Radiopharmaceutical Development
Vienna, Austria
8-11 November 2011
TC 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
NM Centers Performing Nuclear Cardiology

Total Centers as of 2011: 663

- Nuclear Cardiology: 400/663 = 60%
- No Nuclear Cardiology

(source: Nuclear Medicine Database)
World 2009

- CV: 13%
- END: 19%
- SKE: 28%
- THER: 5%
- PET: 3%
- MISC: 3%
- PUL: 4%
- CNS: 1%
- ONC: 3%
- GI: 4%
- GU: 16%
- PET: 4%

World 2009
Radiopharmaceuticals Used in Nuclear Cardiology

- TI-201
- Sestamibi
- Tetrofosmin

Regions:
- Africa
- Asia
- Eastern Europe and Northern Asia
- Latin America & Caribbean
- Middle East
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

Webinars to enhance Nuclear Medicine professional practice

This webinar is designed to increase Nuclear Medicine physicians knowledge of cross sectional anatomy interpretive skills when CT is performed in conjunction with PET and SPECT.

What's New

Collection of Recorded Radiotherapy Seminars

Guidance and Recommendations for the Implementation of Nuclear Cardiology in Developing Countries

Regional Training Course in Radionuclide Therapies - Argentina

Diagnostic Radiology

PET/CT Gallery
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,
IAEA Offers a complete set of CME
Procedures Guidelines

Guidelines in Nuclear Medicine have been, and continue to be, developed by a number of professional organisations throughout the world - some of them are linked to in the 'Related Links' section. National regulations on the administration of radioactive substances and differences in clinical practice and service delivery mean that not all Guidelines necessarily apply across every region/country.

Guidelines are only designed to provide to the nuclear medicine team a framework, which could prove helpful in daily practice. Since these evidence-based frameworks can form the fundamentals for local protocols, they clearly cannot supply the detail required in each individual department. Guidelines should not be utilized in clinical studies at any institution until they have been reviewed and approved by qualified physicians from that specific institution.
Radiopharmacy

Virtual Course in Radiopharmacy

This Virtual Course in Radiopharmacy is part of the **VirRAD project**.

The **VirRAD project** was established in 2002 with funding from the FP7 IST 2001 work programme on Education and Training which was directed to support improvements in the process of learning through the use of ICT, focusing in particular on the trend towards greater individual control and responsibility for training. VirRAD aimed to create a readily accessible virtual-environment where the Radiopharmacist community could meet to learn, exchange views, and discuss best practice and the platform evolved into three main components – a virtual community, a 3-D virtual Radiopharmacy laboratory and the associated **Courseware**.
Human Health Campus goes Mobile!

- Internet-enabled phones: tools for learning
- Limitless Potential for Knowledge Mobilization
- Enhances the learning experience
SPECT Gammacamera QC: Operational checks

Operational Checks

Routine tests

- carried out regularly
- ensure its optimum performance
- determine the rate and extent of any deterioration

Purpose of test (1)

Check of Collimator and Detector Head Mountings and Collimator Damage

To check the collimator and detector head mountings in a scintillation camera. To check for any damage to the collimator.

have to take account of the situation in the individual nuclear medicine department and the status of its instruments.
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 SNMMI
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. Sundeev 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: SNMMI SOCIETY OF NUCLEAR MEDICINE AND MOLECULAR IMAGING IAEA International Atomic Energy Agency
Quality Management Audits in Nuclear Medicine (QUANUM)

Clinical Auditing
The *Quality Management Audits of Nuclear Medicine Practices* project QUANUM is a means by which nuclear medicine facilities can demonstrate the level of patient care they provide by following a process of self- and external evaluation (audits).
Quality Audit

Aim

Assist the local team in maintaining and improving the quality of service to patients to increase the satisfaction of patients, referring physicians and all staff members.
Audits within the QUANUM programme of the IAEA are not inspections!

They are performed on the request of the corresponding department after a thorough self-evaluation according to the QUANUM method.

They complete but do not replace regular internal audits.
Clinical Audit

Such audits will not evaluate the clinical performance of the team in terms of diagnosis and therapy.

But

check the presence and content of standard operation procedures (SOP) and identify deficiencies and potential corrective actions.
Programmed/internal need for assessment

IAEA TC Project

CRP, Regional or other international project

Internal audit team is formed

Managerial & Practice review (QUANUM checklist)

External audit team is formed

Routine Nuclear Medicine activities

Standard met?

Preventive / Corrective Action

External support needed?

Y

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Y

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IAEA
Thank you