IAEA Activities
Supporting The Use of Unsealed Radioisotopes for The Treatment of Benign and Malignant Diseases

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“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
Nuclear Medicine Section

Our Mission

- to enhance capabilities of Member States to address health needs by the use of nuclear medicine or molecular biology techniques.
  - In a cost-effective and efficient manner within a competitive medical service environment
NMS Activities

Two tracks:

- Programmatic activities (Regular Budget)
- Technical Cooperation Programme
NM sub-programme on Therapy

**Therapy**
- Therapeutic Applications of unsealed sources in benign and malignant conditions
- Cost-effective Radiopharmaceuticals for clinical applications and Isotope generators

**Diagnosis**
- NM in management of CVD diseases
- NM in non-communicable and communicable diseases and QA of clinical practices
- PET in CVD and Cancer Management

**In-vitro NM**
- Molecular biology and genomic studies applied in communicable diseases, cancer and genetic disorders
Activities

CRP in Nuclear Cardiology

Nuclear cardiology:
- Research projects on:
  - Detection of CAD in asymptomatic diabetes
  - Myocardial SPECT in acute chest pain
  - G-SPECT for evaluating cardiac function

CVD killer in emerging economies:
- responsible for 30% of deaths
- steeply increasing in emerging economies
- 50% of deaths attributed to ischemic heart disease
  NM plays an important role
PET Activities

- Research and Publication
  - PET and molecular markers in lymphomas
  - PET and myocardial viability
  - Ga-68 RGD and 18FDG in Lung Cancer
- Guidelines on Clinical use of PET
- QA/QC of PET and PET/CT systems
- International Conference on Clinical PET and Molecular Nuclear Medicine
  - Nov 2007, Bangkok
Coordinated Research Projects:
- Ga-68 RGD and FDG PET in NSCLC
- FDG PET and gene profiling non-Hodgkin’s Lymphoma (DLBCL)
- SPECT/CT for the management of bone infections
- SLN Detection in M. Melanoma & Breast Ca. (cooperation) with NAPC* due 2010

* Nuclear Applications Physical and Chemical Sciences
Joint TC and NA support of
Therapeutic Application

- Logistic support of legal framework, designing of departments, procurement of equipment

- Intra-Agency and external collaborations
  - Bone pain palliation using Lu-177 EDTMP
    - Animal, pre-phase (micro-dosing) phase I and phase II
  - Targeted RP-therapy (cooperation NAPC)
    - Enhancing diagnostic capabilities (SPECT & PET)
    - Enhancing national capabilities / HR, SV, equipment and OJT and workshops.
    - Promoting Networking and scientific cooperation
    - Producing consensus Protocols and guidelines (consultancy meetings)
    - Facilitating availability of precursors and Isotopes for Lu-177 DOAT-DATE/TOC.
Past CRPs

Therapeutic Applications

- Management of liver cancer by transarterial intrahepatic radioconjugate of Re-188 Lipiodol injection - Special emphasis on internal dosimetry
  - Dedicates issue: Seminars of Nuclear Medicine 2008;38(2)

- Comparative evaluation of radiopharmaceuticals for Radiosynovectomy for the management of RA and hemophilic Haemarthrosis
  - Re-188 Tin, Y-90 Silicate, P-32 colloid, Eur J. Nucl Medicine (abst.)
  - Submitted papers
Partnerships and Networking

The limited availability of Radiopharmaceuticals is a major constrain towards enhancing therapeutic applications in Developing Countries

IAEA Strategies:

- Enhancing indigenous capabilities (Isotopes and Radiopharmaceuticals)
- Identifying country specific needs / supporting the production of low-cost diagnostic and therapeutic RP
- Improve access to medicinal Isotopes Y-90, Lu-177
Education and Training

Regional training course: 
Paediatric Nuclear Medicine 
Cape Town, SA, Dec. 2007
Education and Training

Education & training:
- Nuclear Medicine in Thyroid Cancer Management: A Practical Approach
- Guideline to bone pain palliation
- Effective application of therapeutic Nuclear Medicine (pipeline)
- Setting up a Nuclear Medicine Service (pipeline)

Publications’ download link:
http://www.iaea.org/Publications/index.html
Education and Training

Education & Training:

- Guidelines on the use of MPI
- Guidelines on the use of PET
- Text book on clinical NM
- A Guide to Clinical PET in Oncology: Improving Clinical Management of Cancer Patients

- Atlas of Bone Scintigraphy in the Developing paediatric Skeleton Variants and Pitfalls

- DAT – Distant Assisted Training Programme for Technologists
- Web-based educational site (to be launched by end of 2009)
- Regional and National training courses and workshops
- And others ……
Training and Education

- MSc. Training programmes
  - India, Egypt, South Africa, Pakistan, etc.
  - Medical and Physicists

- On the Job Training
  - Physicians, Physicists, Radiopharmacists, Technologists

- Expert Missions
  - Assist in starting up new activities
  - Setting up new synthesis modules and QC
  - Lecturing in Workshops etc..
Quality management

Establish high standard of NM practice through a VOLUNTARY Auditing Process
Quality management

- Establish high standard of NM practice in MS through an VOLUNTARY Auditing Process:
  - **QUANUM**: Quality Assurance in Nuclear Medicine

- **Guidelines** published and in the pipeline
  - Quality Assurance for PET and PET/CT Systems
  - Setting up a PET/Cyclotron Centre
  - Setting up a Nuclear Medicine Service
  - Therapeutic Applications in Nuclear Medicine: Guidance to Effective and Safe Implementation
  - Comprehensive Dynamic Renal Analysis Software - for Resident, Expert and Researcher
Summary

- Therapeutic Nuclear Medicine (TNM) procedures mandate a Multi Disciplinary Approach and a high level of specialisation to be Implemented Effectively.

- While the clinical need for TNM is large, the limited routine and sustainable supplies of cost effective radiopharmaceuticals is a prohibitive factor hindering a wide implementation of TNM in many developing countries.

- The IAEA has mechanisms in place to respond to needs of MS by supporting growth and improving the quality of therapeutic applications of NM world-wide.

- Effective cooperation and partnerships amongst industry, research facilities in addition to “Expert Knowledge Transfer” is essential for a safe, successful and sustained activity in therapeutic Nuclear.

Therap. Radiopharm, Nov. 2009, Vienna