Training activities on Radiation Protection in Nuclear Medicine in the frame of the EURATOM FP7 collaborative project MADEIRA

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ORAMED 2011, Barcelona, 22/01/11
MADEIRA in FP7 - EURATOM Seventh Framework Programme

Minimizing Activity and Dose with Enhanced Image quality by Radiopharmaceutical Administrations

The MADEIRA project started 01/2008 and ended 12/2010.

It was aimed to improve the efficacy and safety of 3D PET and SPECT functional imaging by optimising
• the spatial resolution of the diagnostic images
• their signal-to-noise ratio and
• the knowledge of the temporal variation of the radiopharmaceuticals’ concentration in tumour and healthy tissues
MADEIRA in FP7 - EURATOM Seventh Framework Programme

Minimizing Activity and Dose with Enhanced Image quality by Radiopharmaceutical Administrations

7 partner institutions:

Helmholtz Zentrum München, Germany
Prof. Dr. C. Hoeschen, Project Coordination
Dr. A. Giussani, Project Management

Skåne University Hospital, Malmö, Sweden
Prof. Sören Mattsson

Jožef Stefan Institut, Ljubljana, Slovenia
Prof. Marko Mikuž

CSIC, Valencia, Spain
Dr. Carlos Lacasta

SCIVIS, Göttingen, Germany
Dr. G. Ebel

Università degli Studi di Milano, Italy
Prof. Marie Claire Cantone

University of Michigan, USA
Prof. Neal Clinthorne
Scientific organization of the MADEIRA project

Minimizing Activity and Dose with Enhanced Image quality by Radiopharmaceutical Administrations

WORKPACKAGE 1: ASSESSMENT OF CLINICAL DATA
Coordinated by Skåne University Hospital, Sweden (Prof. Sören Mattsson)

WORKPACKAGE 2: PET MAGNIFIER PROBE DEVELOPMENT
Coordinated by Jožef Stefan Institut, Slovenia (Prof. Marko Mikuž) in cooperation with CSIC (Dr. Carlos Lacasta) and University of Michigan (Prof. Neal Clinthorne)

WORKPACKAGE 3: PHYSICS-BASED IMAGE PROCESSING
Coordinated by Helmholtz Zentrum München (Prof. Dr. Christoph Hoeschen) in cooperation with SCIVIS (Dr. Gernot Ebel)

WORKPACKAGE 4: BIOKINETIC AND DOSIMETRIC MODELLING
Coordinated by Università degli Studi di Milano (Prof. Marie Claire Cantone) in cooperation with Helmholtz Zentrum München (Dr. Augusto Giussani).
Training activities in the MADEIRA project

**WORKPACKAGE 5: TRAINING AND DISSEMINATION ACTIVITIES**

Coordinated by Helmholtz Zentrum München (Dr. Augusto Giussani)

- Mobility and exchange of young researchers (PhD students, early PostDocs)
- Organization of three Training Courses:

  **RADIATION PHYSICS FOR NUCLEAR MEDICINE**
  
  First MADEIRA training course
  
  18-21 November 2008, Milano, Italy
  
  *In memory of Prof. Niki Molho*

  **2nd MADEIRA Training Course**
  
  Radiation Protection in Nuclear Medicine
  
  17-20 November 2009, Malmö, Sweden

  **Third MADEIRA Training Course on IMAGING IN NUCLEAR MEDICINE**
  
  5-8 October 2010
  
  München, Germany
The MADEIRA Training Courses

A four-day theoretical and practical course oriented to university students and young researchers.

Topics:  
- issues regarding nuclear medicine  
- presentation of research performed in the frame of the project

Each training course accompanied by a book on the same topic published by Springer Verlag (first volume to be published in Spring 2011)
The Second MADEIRA Training Course

The course was aimed for medical physicists, technicians, physicians in nuclear medicine and radiology, radiochemists, engineers, PhD-students, radiation protection experts and others involved in nuclear medicine, radionuclide production and radiation protection.

<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday 17/11</th>
<th>Wednesday 18/11</th>
<th>Thursday 19/11</th>
<th>Friday 20/11</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00</td>
<td>Welcome</td>
<td>Meet the teachers (optional)</td>
<td>Meet the teachers (optional)</td>
<td>Meet the teachers (optional)</td>
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<tr>
<td>09.15</td>
<td>Quantities used in radiation protection (SM)</td>
<td>Radiation doses from patients (DZ)</td>
<td>Radiation protection during production, labelling and injection (SLS, LS)</td>
<td>Current research: Radiobiology of the lens of the eye (ICRP Cte 1) (GD)</td>
</tr>
<tr>
<td>10.00</td>
<td>Radiation protection detectors and dose meters (EF)</td>
<td>Radiation exposure of embryos, foetuses and children (MCC)</td>
<td>Occupational exposure (SK)</td>
<td>Quality assurance, reference activities</td>
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<tr>
<td>10.45</td>
<td>Coffee break</td>
<td>Coffee break</td>
<td>Coffee break</td>
<td>Coffee break</td>
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<tr>
<td>11.15</td>
<td>Radiobiology, Critical organs (patients and staff members) (PB)</td>
<td>Shielding, calculation exercises</td>
<td>Releases to environment from hospitals and patients (SM)</td>
<td>Questions and discussions Rules of the thumb</td>
</tr>
<tr>
<td>12.00</td>
<td>Effective dose Radiation doses to patients (AG, CH) -biokinetic models -phantoms</td>
<td>Shielding, computer exercises (HU)</td>
<td>An introduction to OLINDA (AG, SLS)</td>
<td>Course evaluation</td>
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<tr>
<td>12.45</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
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<tr>
<td>14.00</td>
<td>Cont. Effective dose Radiation doses to patients (AG, CH) -biokinetic models -phantoms</td>
<td>Visit to Bispebjerg Hospital and Herlev Hospital in Denmark Including lecture: An example of shielding in PET work (MNL)</td>
<td>Guided exercises: -on patient dose calculation, OLINDA (SLS) -practical exercises on shielding ($^{99m}$Tc vs $^{18}$F)</td>
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<tr>
<td>15:00</td>
<td>Get together</td>
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## The Second MADEIRA Training Course

<table>
<thead>
<tr>
<th>Category</th>
<th>TC2</th>
<th>TC1</th>
<th>TC3</th>
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<tbody>
<tr>
<td>Number of participants:</td>
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<tr>
<td>Number of participants:</td>
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<td>of which: from host country:</td>
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<td>22</td>
<td>3</td>
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<td>from other EU countries:</td>
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<td>14</td>
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<td>from outside Europe:</td>
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<td>3</td>
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<td>Medical physicists / hospital</td>
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<td>Medical physicists / univ.-research</td>
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<tr>
<td>Other physicists</td>
<td>-</td>
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<td>Radiation protection officers/regulators</td>
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<td>Physicians</td>
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<tr>
<td>Postdocs</td>
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<td>Students</td>
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<td>16</td>
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<tr>
<td>Other</td>
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<td>Course evaluation (on a scale from 0 to 5)</td>
<td>4.0</td>
<td>4.0</td>
<td>4.25</td>
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<tr>
<td>Utility for future career</td>
<td>3.9</td>
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Is there a future after MADEIRA?

Need for training in Nuclear Medicine (several students requested the continuation of the TC series, even after MADEIRA)

"Fidelity": seven students participated (or applied to) more than 1 TC, in other cases colleagues of the same group/department participated to different TCs

FUTURE COURSES???

Definition of a dedicated TRAINING goal

Ex.: operational radiation protection in nuclear medicine
biokinetic and dosimetric studies
QA activities (MADEIRA phantom)

Continuous medical education credits (CME)? Important for hospital personnel

Cooperation with other bodies: EANM, EFOMP, IAEA…
First MADEIRA Training Course
Milano, Italy, 18-21 November 2008
For further information

www.madeira-project.eu
www.madeira-training.org
agiussani@bfs.de