Quality and Safety in Radiology.
State of Medical Physicists in Latin America

Simone Kodlulovich Renha
National Commission of Nuclear Energy, Brazil
President of the Latin American Association of Medical Physicists (ALFIM)
Contribution: ALFIM BOARD and Dr Lidia Vasconcellos de Sá
Introduction:
Diversity of Image Modalities
Advances in Digital Radiology and new Technologies
Fluoroscopy and Interventional Radiology

CTF

DSA
CT: New Possibilities
Hybrid Systems: PET-CT, PET-MRI and application of CT in RT planning

Multi modality

PET + MRI

Blood flow changes under speech activation (red)
Tumor (green)

From: Klaus Wienhard
MPI für Neurologische Forschung, Köln
Changing Concepts...and Routine
World Health Organization (WHO)

Radiation in Health Care

The use of radiation in health care is by far the largest contributor to the exposure of the general population from artificial sources.

Annually worldwide:

- 3,600 million X-ray exams (> 300 million in children)
- 37 million nuclear medicine procedures
- 7.5 million radiation oncology treatments

[UNSCEAR Report 2008]
Jury awarded $1 million to 57-year-old man who sustained serious skin injury after two coronary artery angioplasties that occurred 5 months apart and sued (L Berlin 2001)

USA Today
November 20
2000

Deterministic Effects:
Patient and Occupational
Searching for solutions

- Justification
- Optimization
- Reference levels
- Multidisciplinary staff – importance of the medical physicist in the service....
- To raise awareness of MP role in the radiology departments.....
- But, are we already prepared?
Medical Physicist

 Classified by the International Labor Organization as a profession in the International Standard Classification of Occupations-08 (ICSO-08)

A health professional, with specialist education and training in the concepts and techniques of applying physics in medicine, and competent to practise independently in one or more of the subfields (specialties*) of medical physics.

*(e.g. diagnostic radiology, radiation therapy, nuclear medicine)
Distribution of MP/Clinical Area

Concentration in Radiotherapy

- DR: 15%
- NM: 13%
- RT: 72%
MP courses/country
Number of residence is too low!
MP Postgraduate course/country
Hospitals and clinics that provide practical clinical training in MP
MP and facilities in RT/country.

MP is Mandatory in all countries.
MP and facilities in NM/country.

- Number of facilities in NM
- MP in MN

* MP is Mandatory
** MP is not Mandatory

Other countries: no information
## RX equipment and MP/country

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of equipment in DR</th>
<th>MP in DR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>No data</td>
<td>10</td>
</tr>
<tr>
<td>Brazil</td>
<td>160000</td>
<td>63</td>
</tr>
<tr>
<td>Chile</td>
<td>10000</td>
<td>0</td>
</tr>
<tr>
<td>Colombia</td>
<td>20000</td>
<td>5</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>No data</td>
<td>2</td>
</tr>
<tr>
<td>Cuba</td>
<td>1200</td>
<td>9</td>
</tr>
<tr>
<td>El Salvador</td>
<td>170</td>
<td>0</td>
</tr>
<tr>
<td>Equator</td>
<td>3000</td>
<td>0</td>
</tr>
<tr>
<td>Guatemala</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Honduras</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>México</td>
<td>16000</td>
<td>27</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>120</td>
<td>0</td>
</tr>
<tr>
<td>Panama</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Paraguay</td>
<td>1309</td>
<td>3</td>
</tr>
<tr>
<td>Peru</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Uruguay</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
In order to maximize the benefits of the new technologies in imaging diagnostic and intervention it is essential to have a multidisciplinary staff which work together to improve the health care.

Strengthening the collaboration and sharing knowledge and experience with a multidisciplinary staff can make positive difference for patients, public and professionals.
Conclusion

▲ MP are highly qualified health professionals that work to ensure the quality of the procedures while minimizing risks associated with radiation. Raising awareness of Medical Physics profession is of great importance to society in general. (IOMP, 2013)

▲ The technologies is changing, we also have to change and be prepared…
For all Radiologist……..

△ You all received a precious gift, one special perception and ability …

• The possibility to identify and to classify an information (even hidden) in a clinical image which make the difference in patients lives

• And you share with us in your routine, providing for us our diagnostic and treatment

• The knowledge and the experience we all now that is fundamental, however is your work carried out deeply with the heart and the soul that make you all very special for us…..

• Thank you so much