Support to Quality Improvement and Safety in Medical Physics Services

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Radiation Medicine

• From crude beginnings more than 100 years ago,
  Diagnostic radiology (DIR),
  Nuclear medicine (NM)
  Radiation Therapy (RT)

Have all evolved into advanced techniques that are delivered with complex technologies.
Quality in Radiation Medicine

Under patient care, the role of a medical physicist involves quality and safety activities,

High quality
Effectiveness

Comprehensive Quality Assurance Programme

IAEA initiatives to support external audits in RT, DIR and NM
Quality in Radiation Medicine

The key responsibility of Medical Physicist

Getting the right dose to the right place
Regional situation: Africa

Fact & Figures

<table>
<thead>
<tr>
<th>Year</th>
<th>Total cancer cases</th>
<th>MV unit per $10^3$ cancer cases</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>+33.0%</td>
<td>+15.2%</td>
<td>+2.75%</td>
</tr>
<tr>
<td>2020</td>
<td>844279</td>
<td>29.9%</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Linac vs Co-60: 5.7
- 50% Linac+Co-60
- 20% only Linac
- 11% only Co-60
- 48% no EBRT

Abdelwahab et al. The Lancet Oncology (2013)
Elmore et al. The Lancet Oncology (2021)
The shortfall in radiotherapy resources in Africa is worsening as the incidence of cancer increases on the continent.

- Insufficient staff in relation to the workload.
- Lack of professional recognition for Medical Physicists. This has the potential to affect the quality of radiotherapy.

### Regional situation: Africa

#### MPs per million population for different regions

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (Million)</th>
<th>No. of MPs</th>
<th>MPs per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>43.0</td>
<td>129</td>
<td>3.0</td>
</tr>
<tr>
<td>Egypt</td>
<td>99.6</td>
<td>374</td>
<td>3.7</td>
</tr>
<tr>
<td>Morocco</td>
<td>35.7</td>
<td>61</td>
<td>1.7</td>
</tr>
<tr>
<td>South Africa</td>
<td>58.8</td>
<td>136</td>
<td>2.3</td>
</tr>
<tr>
<td>Tunisia</td>
<td>11.5</td>
<td>37</td>
<td>3.1</td>
</tr>
</tbody>
</table>

0.02 < Range for the region < 3.7

79% of MV units of the region.
Much effort remains to be made at the level of MSs for the recognition of the MP as a health professional.
How to overcome this situation

- Support of cancer radiotherapy treatment and diagnostic imaging projects and HR development.
- Development of guidelines; databases;
- Providing a quality assurance framework and review missions
- Providing technical, advisory and dosimetry laboratory services
- Educational and research initiatives.

IAEA support MSs’ fight against cancer using nuclear and nuclear-related techniques
IAEA Collaborating and Anchor Centres

Assist the IAEA by undertaking original research and development and training relating to nuclear science, technologies and their safe and secure applications.
Promote IAEA Collaborating and Anchor Centres to fight cancer in Africa.

To participate in scientific and technical backstopping by providing expertise, participating in relevant research, organizing training courses, hosting fellowships and scientific visits, etc.
Rays of Hope to raise Hope in Africa

Rays of Hope will integrate the IAEA’s expertise to support MSs in the diagnosis and treatment of cancer using radiation medicine.

Rays of Hope will build or strengthen radiation safety legislation and infrastructure and provide quality control, guidance, training and equipment.

Collaborating Centre scheme helps reach important targets of the United Nations’ Sustainable Development Goals

For a World without fear of cancer