A NEW APPROACH FOR EDUCATION AND TRAINING OF MEDICAL PHYSICIST IN CUBA: FROM UNIVERSITY TO CLINICAL TRAINING

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In the 80’s Cuba started an important program in nuclear energy.

The nuclear program included a clear strategy of human resources preparation:

- Education and training of specialists in foreign universities.

- On the basis of the first groups of graduates abroad to create conditions for starting the preparation of nuclear specialists in Cuba.
1992-93: The construction of the NPP was stopped. The project of the Nuclear Research Center was canceled. The Nuclear Program was rearranged with more modest objectives.

Many nuclear related specialists available for other fields, including Medicine.
Cuban Master in Sciences in Medical Physics (MSMP)

- Accredited by the Ministry of High Education in 2000
- Based on Syllabus of IAEA Regional Project “ARCAL L”
- Four specialties:
  - Radiation Oncology (RO)
  - Nuclear Medicine (NM)
  - Diagnostic Radiology (DR)
  - Radiation Protection (RP)
- 3 editions, 25 graduated
“Diploma” in Radiotherapy Physics

- Sponsor by University of Medical Sciences and the National Oncology Institute
- Accredited by the Cuban Nuclear Regulatory Body in 2004
- Based on IAEA SYLLABUS ON MEDICAL RADIATION THERAPY PHYSICS
- Subjects recognized by the MSMP
- 3 editions, 42 graduated

“Diploma” in Nuclear Medicine Physics

- Sponsor by University of Medical Sciences and the “Ameijeiras Hospital”
- Accredited by the Cuban Nuclear Regulatory Body in 2007
- Based on an IAEA Curriculum for the Training of Medical Physicists in Nuclear Medicine (RAF/6/032)
- Subjects recognized by the MSMP
- 2 editions, 25 graduated
MP Education and Training in LA
IAEA approach

BS in Physics (or related field) 4-5 years
✓ BSc. In Nuclear Physics
✓ Nuclear Engineering
Postgraduate (MS) in MP or in specific field (RO, NM, DR) 1-2 years

Supervised Clinical Training 2-3 years

MS or PhD in Physics (or related field) 2-4 years
Complete, if needed, additional education in MP 1 year

Clinically Qualified Medical Physicist (CQMP)
+6 years of clinical practice

Expert in MP

70% of Cuban CQMPs are graduated of nuclear related programs

Andreo (IAEA), Jimenez (PAHO), Alfonso (CUB), Brandan (MEX), Brunetto (ARG), Castellanos (COL), Da Cruz (BRA), Gutt (VEN),
- IAEA Project - RLA/6/051
IAEA Syllabus 2013

Distribution of MP by specialty (CUBA)

- Radiotherapy: 7%
- Nuclear Medicine: 12%
- Diagnostic Radiology: 29%
- Radiation Protection: 52%

Compulsory subjects:

Optional subjects:
- Diploma "RO Physics"
- Diploma "NM Physics"
- Diploma "DR Physics"
MSc. MP

Diploma

DFM-01: Radiation Physics and Dosimetry
DFM-02: Radiation Measurements
DFM-03: Medical Image processing
DFM-04: Fundamentals of Radiotherapy Physics
DFM-05: Fundamentals of Diagnostic Imaging Physics
DFM-06: Radiation Protection in Medicine
BS programs are being reduced from 5 to 4 years

Subjects on MP inserted as optional in BS programs:

- BSc. in Nuclear Physics
- Nuclear Engineering

Allowing shortening MP academic education from 7 to 5 years

Plus one semester of specialization in one of the areas and one semester of research (MS thesis)
• On-the-job training

• Required by Nuclear Regulatory Body for licensing MP only in RO & NM.

• Not regularized yet by health authorities (MINSAP)

• Expected output of new IAEA Technical Cooperation Project CUB/6/025 (2016-2018)
Review of the academic activity

Improve the actions at the graduate level
Conclusions

The combination of a more MP oriented basic university programs, a MSMP with a stronger practical component closely linked to in-hospital training programs, and a high academic level doctoral program for reinforcement of teaching human resources, will contribute to a optimal and safer introduction of newer technologies in Radiation Medicine.