THE CLINICAL MEDICAL PHYSICS SITUATION IN AFRICA

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ABSTRACT

Medical Physics in Africa has evolved over the last half a century from the Republic of South Africa in the southern tip of the continent to Ghana and Nigeria in the Western half and also Kenya, Uganda and United Republic of Tanzania in the Eastern sphere of the region and unto Algeria, Egypt, Morocco and Sudan in the Northern part.

There is a wide disparity in terms of educational infrastructure and availability of equipment across this very wide geographical landscape to provide the required medical physics services particularly in the health establishments as well as the other areas where the expertise of this cadre of professionals are needed. In terms of human resources capability, the continent can only boast of a slightly more than 300 personnel employed in and around her health facilities and about 60% of those staff are domiciled in just three countries – Egypt, Morocco and Republic of South Africa.

An attempt will be made in this presentation to discuss the clinical medical physics issues both from the historical perspectives as well as the current state of affairs in the continent which culminated in the recent birth of the Federation of African Medical Physics Organisation (FAMPO) which has just been recently given a charter as the youngest regional body of the International Organisation of Medical Physics (IOMP).

Learning Objectives:

- The Medical Physics infrastructure in terms of equipment and manpower.
- The Status of Education and Training in Africa.
- The gaps in the Medical Physics profession that FAMPO intends to address in the continent.

CONTENTS OF PRESENTATION

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MAP OF AFRICA
THE COUNTRIES IN AFRICA
- 55 countries in the Continent
- 49 are UN members
- 38 are IAEA member states and
- 32 are AFRA (Regional) member states

THE EDUCATIONAL INFRASTRUCTURE
(MEDICAL PHYSICS ACADEMIC AND CLINICAL TRAINING PROGRAMMES)
- 9 Countries have Education Programs leading to a Qualification
- 3 of these Countries have Clinical Training Programs
- 3 Countries with a Health Professions Council requiring registration to practice as Medical Physicist (South Africa, Zimbabwe, Namibia)
- Many adopt Professional Registration criteria from other countries but do not have formal national criteria.
- 2 countries have an established National Professional Society (South Africa and Morocco)

COUNTRIES WITH ACADEMIC PROGRAMMES
- ALGERIA
- EGYPT
- GHANA
- LIBYA
- MOROCCO
- NIGERIA
- SOUTH AFRICA
- SUDAN
- TUNISIA

COUNTRIES WITH CLINICAL / RESIDENCY PROGRAMMES
- EGYPT
- MOROCCO
- SOUTH AFRICA
THE CLINICAL SITUATION - IMAGING

- Most countries have only basic radiology equipment
- < 20 countries have access to nuclear medicine
- Fewer medical physicists are dedicated to imaging than to RT
- High end imaging (e.g. mammography, MRI, PET/CT) is available in the public sector in < 10 countries
- Tele-radiology is limited by telecommunications infrastructure

THE CLINICAL SITUATION – RADIOTHERAPY.

- 22 countries have radiotherapy facilities
- 9 countries have one centre
- <5 countries have a ‘basic’ radiotherapy service as defined by IAEA
- ≤7 countries with new projects for RT
- <10 countries with adequate facilities to service their populations, i.e. a manageable waiting list

CASE STUDY IN AFRICA.

NIGERIA

NIGERIA IN AFRICA
THE MOST POPULOUS COUNTRY IN AFRICA
(Estimated 150 million people)

NIGERIA

• Three-tier structure:
  • Federal Government
  • 36 State Governments
  • 774 Local Government Administrations

THIS IS THE ‘FACE’ OF ABUJA
– the Nigeria Capital City!

ACADEMIC TRAINING PROGRAMMES
(M.Sc. / Ph.D. Medical Physics Programme)

• Benue State University, Makurdi.
• Obafemi Awolowo University, Ile-Ife.
• University of Lagos, Lagos.
• University of Nigeria, Nsukka.

• Nassarawa State University, Keffi.*
• University of Calabar, Calabar.**
RADIOTherapy CENTRES IN NIGERIA

- National Hospital, Abuja – FCT.
- Ahmadu Bello University Teaching Hospital, Zaria.
- Federal Medical Centre, Gombe.
- Usman Danfodiyo University Teaching Hospital, Sokoto.
- Lagos University Teaching Hospital, Lagos.
- Eko Hospital, Lagos.
- University College Hospital, Ibadan.
- University of Benin Teaching Hospital, Benin-City.
- University of Nigeria Teaching Hospital, Enugu.
NHA LINAC

Medium X-ray unit: PANTAK (30 – 150 kVp) & Manual LDR Afterloader Units (AMRA CIS-Bio)
Turn-key by Austrian Company (VAMED), under a multi-site, multi-year contract with the Federal Ministry of Health.

Advanced new equipment include:
- Multislice dedicated CT and CT-SIM
- Elekta Precise Plan Planning System
- Elekta Linac (with 2 Photon and 6 Electron Energies)
- Computerized Block Cutting (Mould Room)
- Physics dosimetry equipment, etc.

Independent power generator for all!!
LUTH, UBTH, UDUTH & UNTH FACILITIES

- LINAC (ELEKTA) – 6 & 15 MV Photons and 6 Electron Energies (4, 6, 8, 10, 12 and 15 Mev’s)
- CT – SIM (GE)
- TPS (PRECISE PLAN)
- MOULD ROOM FACILITY
- COMPLETE DOSIMETRY EQUIPMENT
- VERY MODERN BUILDING HOUSING THE BUNKER, CLINICS, SEMINAR ROOM, STAFF LOUNGES AND OFFICES.
- BACK-UP GENERATORS
- LUTH (LAGOS), UBTH (BENIN), UDUTH (SOKOTO) & UNTH (ENUGU).

THE PROPOSED RESIDENCY PROGRAMME IN NIGERIA

- Implementation of the IAEA’s Training Course Series (TCS) No. 37 of 2009 (Clinical Training of Medical Physicists Specializing in R.O.)
  - Residency Programme to complement the existing academic programme.
- Deployment of the AAPM – TG 131 – Web based tools for training Medical Physicists Internationally coupled with extensive local visits and emphasis on hands-on experience.

IAEA TCS 37 IMPLEMENTATION IN NIGERIA.

- IAEA PROJECT NIR 2010003 ON “THE DEVELOPMENT OF NATIONAL CAPACITY TO TRAIN MEDICAL PHYSICISTS” IS SET TO COMMENCE BY JANUARY 2012 THROUGH THE ENDEAVOUR IN THE FIRST INSTANCE.

- THE FIRST PILOT PROGRAMME OF ITS KIND IN AFRICA – SET TO FOLLOW THE SIMILAR SUCCESS STORY IN THAILAND AND PHILIPPINES.

- THE GOVERNMENT OF THE FEDERAL REPUBLIC OF NIGERIA THROUGH THE NIGERIA ATOMIC ENERGY COMMISSION (NAEC – THE LEAD AGENCY) AND ALL THE RELEVANT STAKEHOLDERS ARE COMMITTED TO THE SUCCESS OF THIS NATIONAL INITIATIVE DESIGNED TO ADDRESS ONE OF THE NATIONAL EMERGENCY OF OUR TIME!

- SENIOR COLLEAGUES AND RETIREES OF AAPM AND COMP ARE INVITED TO ASSIST IN THIS EFFORT BY GIVING AN INDICATION AS TO WHEN THEY CAN MAKE OUT TIME TO VISIT THE FACILITIES IN NIGERIA TO IMPART THE NECESSARY SKILLS AND KNOWLEDGE TO THE VERY EAGER, DEDICATED AND ENTHUSIASTIC LOCAL STAFFS IN A BID TO OPERATE THE AVAILABLE EQUIPMENTS IN A VERY SAFE AND SUSTAINABLE MANNER – A DIARY IS PROVIDED HERE FOR VOLUNTEERS !!!!

WHAT THE AAPM & COMP CAN DO IN NIGERIA ???

- EXTENSIVE LOCAL VISITS (1 – 6 MONTHS) – WITH EMPHASIS ON PRACTICAL (HANDS-ON) DOING, TAP EXPERIENCED MEMBERS THAT CAN TAKE THE TIME TO BE AWAY.
- LEVERAGE EXPERIENCE AND TECHNICAL KNOW-HOW WITH TECHNICAL AND PRACTICAL ASPECTS OF PRACTICE.
- USE VISITS TO SUPPORT THE EFFORTS ON “RECOGNITION OF MP AS A PROFESSION” VIZ-A-VIZ LOCAL AUTHORITIES.
- REMOTE TRAINING – DEVELOP A PILOT IMPLEMENTATION OF WEB-BASED TOOLS (TG-131), PERRY SPRAWLS FOUNDATION, ETC !!!!
FAMPO HISTORY

- SAAPMB CONGRESS IN DURBAN – 2008
- LETTER OF INTENT TO IOMP - 2008
- DRAFT CONSTITUTION – 2008/2009
- WORLD CONGRESS IN MUNICH – 2009 (MEFOMP and FAMPO)
- RAF/6/031 PCM IN HARARE - DEC 2009
- INSTRUMENTS SUBMITTED TO THE IOMP SG IN VIENNA – DEC 2009
- IOMP CHARTER - MAY 2010
- FIRST OUTING – AFRIRPA 2010 IN NAIROBI (13-17 SEPT)

FEDERATION OF AFRICAN MEDICAL PHYSICS ORGANISATIONS

CONSTITUTION

- 2nd Draft: Monday, 23 June, 2008
- Revised: Monday, 28 July, 2008
- 3rd Draft Tuesday, 07 October 2008
- Final Wednesday, 25 March 2009

- Section A: Name, Scope and Extent of Activities.
  - Article 1
    - The Society bears the name “Federation of African Medical Physics Organisations” (FAMPO), hereinafter called “the Federation”.
  - Article 2
    - The Federation extends its activities throughout the Africa and local Islands in the Region. The membership adopted shall be from amongst IOMP member Organisations and Medical Physicists in Africa.
  - Article 3
    - The Federation may remain in existence for an unlimited period. The voluntary dissolution of the Federation shall be approved only in accordance with the Articles of this Constitution.

- Section B: Aims and Functions.
  - Article 4
    - The aims and purposes of the Federation are:
      - To promote improved quality service to patients and the community in the region;
      - To promote the co-operation and communication between Medical Physics Organisations in the region, and where such Organisations do not exist between Individual Medical Physicists;
      - To promote the profession and practice of medical physics and related activities in the region;
      - To promote the advancement in status and standard of practice of the medical physics profession;
      - To promote and improve the training of Medical Physicists;
      - To promote research and development in the field of Medical Physics;
      - To promote appropriate use of technology to the benefit of rural populations;
      - To organize and/or sponsor international conferences, regional and other meetings or courses;
      - To collaborate or affiliate with other scientific organisations;
      - The activities of the Federation are not aimed at profit.
Section C : Membership.

- **Article 5**
  - Membership of the Federation shall consist of:
  - Organisational Membership of IOMP Members
  - Individual Membership (See Article 7)
  - Honorary Membership (See Article 7)
  - Additional categories of membership created according to Article 8 (see Appendix)
  - Membership lists signed by the Representatives of the Membership Organisations and Individual Members are to be found in Appendix 2 of this Constitution.

Section D : Administration.

- **Article 10**
  - The Council is deemed to be the Constitutional Body of the Federation and directs the activities of the Federation.
  - The Council comprises Council Members, one from each country, appointed by each Organisational Member or Individual Member and the Officers of the Council.
  - The Officers of the Council are: The President, The Vice-President, The Secretary-General, The Treasurer and Chairpersons of the Committees.
  - The executive Officers are the President, Vice-President, Secretary-General, Treasurer and the Immediate Past President
  - The President of the Council can invite individuals, in particular Honorary Members and representatives of co-operating Organisations to attend Council as observers.

Section F : Financial Resources.

- **Article 14**
  - The financial resources of the Federation consist of:
  - Subscriptions paid by Members;
  - Gifts, bequests and legacies;
  - Subsidies and grants;
  - Any other resources or revenues which may result from the Federation’s activities or investments.

ATTENDANCE AT THE HARARE MEETING – DEC 2009:

- W.A. Groenewald  - South Africa
- G.Z. Assaad  - Libya
- Moaz Bouch  - Tunisia
- Odette N. Santha  - Cameroon
- Khaled El-Shahat  - Egypt
- Fuadoujine Rafa宝玉  - Morocco
- Tahir bin Suleyman  - Ghana
- Pierre F. Dioppe Moum  - Algeria
- Ahmed Ibn Seddik  - IAEA (Observer)
- Walter Njokondo  - Kenya
- Rebecca Nakadzi  - Zambia
- Ahmed Meghzifene  - Morocco
- Freedom Hliziyo  - Zimbabwe
- Philip K. Ndonye  - Kenya
- Peter F. Ddungu Matovu  - Uganda
- Ahmed Meghzifene  - Morocco
- Taofeeq A. Ige  - Nigeria

Apologies:
- Salwa Boutayeb  - Morocco
- Debbie Van der Merwe  - South Africa
ELECTED OFFICIALS:

- Dr. Ahmed Ibn Seddik (Morocco) – President
- Ms. Rebecca Nakatudde (Uganda) – Vice-President
- Dr. Taofeq Ige (Nigeria) – Secretary-General
- Dr. Khaled El-Shahat (Egypt) – Treasurer

FAMPO GETS THE IOMP CHARTER – MAY 2010

AFRICAN NMO’s AND CURRENT IOMP STATUS.
It is inconceivable to have centres with equipments without having well qualified man power (reference to the Case Study). The consequences are better imagined than contemplated because this may lead to more incidents and accidents, increased machine down time and loss of funds by governments. Therefore, training of Medical Physicists have been clearly identified as the key to FAMPO’s agenda.

In all matters of FAMPO’s activities, stake holders are going to be involved. This will be a quicker, easier and transparent procedure to drive the systems, especially with our governments. IOMP is in position to support all activities, but the initiative is in our hands.

Young Medical Physicists needs to be guided and attended to by qualified senior ones in their countries and those in Diaspora – I therefore seize this singular opportunity to bring this message to this august (in august !) audience of AAPM and COMP.

More information should be disseminated with respect to training opportunities, congress attendance and whatever is happening in the field of Medical Physics in and around the world.

Governments should work closely with FAMPO through the council members (when constituted) from individual countries to support training, bonding the Medical Physicists by employing them to ensure retention – thus minimising brain drain!

FAMPO is set to create a data base to improve her functioning. This entails the Identification of all Medical Physicists and their addresses in Africa, identification of all centres of Radiotherapy, Nuclear Medicine and Diagnostic Radiology in Africa, identification of the type of equipments and sources used in these centres. This information can be used as a base line for training by assessing demand and deployment of Medical Physicists in individual African countries.

(Please visit our website – www.federation-fampo.org !)

The Regional Designated Centres (RDC’s) by the IAEA in the countries where we can have local training of Medical Physicists needs to be further supported and strengthened.

The President of IOMP (Prof. F. Nusslin) is working closely with manufacturers that are willing to participate in local training of Medical Physicists – perhaps we will have some feedback on this proposal since Prof Nusslin is at this meeting !)

Countries have demonstrated willingness to share resources especially in training to solve our challenges in Africa (EGY, MOR and SA).
WAY FORWARD ?

The Panel Discussion that Follows!

ACKNOWLEDGEMENTS

We wish to thank:

• The AAPM for Dr. Ige’s invitation to this Meeting and defraying the cost of his air-fares among other reimbursements.

• Profs. Don Frey, Perry Sprawls, Yakov Pipman and Paul Gueye for providing and making the necessary contacts.

• The Executive Chairman, Nigeria Atomic Energy Commission, Abuja.

• The Chief Medical Director, National Hospital, Abuja.

• For their Wonderful Support always and Facilitating this trip.

• Angela Keyser, Laurie Hayden, Yakov Pipman, Paul Gueye and Gisele Kite for their last minute intervention on the VISA issue !!!

• and last but not the least, The International Atomic Energy Agency (IAEA) for the numerous initiatives and contributions to the growth of Medical Physics in the Continent of Africa and world-wide (INT/6035).

THANK YOU VERY MUCH FOR YOUR ATTENTION
AND SEE YOU IN NIGERIA AND AFRICA VERY SOON.