

MEDICAL PHYSICS EDUCATION AND TRAINING IN NIGERIA

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Abstract— Medical Physics training and education in Nigeria is currently being offered in eight universities as a purely academic postgraduate program. This ensure that all medical physicists practicing in the country are master’s degree holder and a few being PhD holder. The Clinical Residency programme in Radiation Oncology Medical Physics commenced in 2012 using the IAEA TCS-37 (Clinical Training of Medical Physicists Specializing in Radiation Oncology), the first cohort of trainees are set to graduate soon. Nigeria currently has 10 (ten) Government and Privately owned Radiotherapy centres. More centres are expected to go operational shortly. More Medical Physicists are also being trained academically and are expected to give a boost to the professional practice of Medical Physics in Nigeria in the coming years.

Keywords — Medical Physics, Nigeria, Radiotherapy, Radiology, Nuclear Medicine

I. INTRODUCTION

Medical physicists are professionals with education and specialist training in the concepts and techniques of applying physics in medicine. Medical Physicists work in clinical, academic or research institutions. Medical physics may further be classified into a number of sub-fields including the following; Radiation Oncology, Medical Imaging, Nuclear Medicine, Radiation Protection, Non-ionizing Medical Radiation Physics and Physiological Measurement [1].

Nigeria is a Country located in the west coast of the African continent and has a proximity to the Gulf of Guinea and bordered southerly by the Atlantic Ocean. It is a diverse country with over 200 Million people [2]. It currently have 10 centres to cater for the radiotherapy needs of her citizenry.

Medical Physics practice in Nigeria started as far back as 1968 when the first Radiotherapy and Oncology centre was established at the Lagos University Teaching Hospital (LUTH).

Medical Physics Academic tranning programme currently takes place in eight (8) Universities in Nigeria. These ensures that all practicing Medical Physicists in Nigeria are Master’s degree holder with extremely few exceptions and a few more having a doctorate degree.

The Clinical training of Medical Physicists with bias towards Radiation Oncology (Radiotherapy) due to national exigencies was started in 2012 through the support of IAEA by the Nigerian Government under the country project NIR/6/023 using the IAEA TCS 37 course modules.

II. INFRASTRUCTURE

Nigeria has infrastructure for medical imaging, radiation therapy, and nuclear medicine service points situated in the private and public (government) centres. Radiation protection services are also available in Nigeria through the NNRA’s Dosimetry Laboratory (SSDL) in Ibadan and some public institutions including the National Hospital Abuja OSLD services and some four other privately owned enterprises.

There are numerous medical imaging facilities in Nigeria with them having machines such as CT, MRI, X-ray, C-arm and Ultrasound. An appropriate estimation would be over 1000 centres.

For Radiotherapy, a vast majority of them (8) are government-owned, They are Ahmadu Bello University Teaching Hospital (ABUTH) in Zaria, University of Benin Teaching Hospital (UBTH) in Benin-City, University Colleague Hospital (UCH) in Ibadan, National Hospital Abuja (NHA) in Abuja, University of Nigeria Teaching Hospital (UNTH) in Enugu, Usmanu Danfodiyo University Teaching Hospital (UDUTH) in Sokoto, Federal Teaching Hospital (FTH) in Gombe, Lagos University Teaching Hospital (LUTH) in Lagos and also the privately owned EKO Hospital and the Imo project near Owerri

Table 1 Medical equipments for medical imaging and radiation therapy

Equipment	Total
SPECT/CT	None
SPECT	2
PET/CT	None
Dose calibrators	4
Co-60 EBRT	4
Accelerator	7
MRI	85
CT	150
Mammography	60
Standard Radiology	3000
Interventional	8
Brachytherapy	8

III. REGULATION OF MEDICAL PHYSICS

The Medical Physics Interim Registration Committee under the Department of Hospital Services in the Federal Ministry of Health currently performs the regulatory functions on Medical Physicists in the country. This is done in conjunction with the professional association – Nigerian Association of Medical Physicists (NAMP). NAMP is a National Member Organisation (NMO) of the International Organization of Medical Physics (IOMP) and Federation of African Medical Physics Organization (FAMPO). NAMP members meet annually at the association’s annual scientific conference and workshop. This conference features discussion on trending topics in the medical physics world and moving the practice forward in the country.

Table 3 Distribution of Medical Physicists in Nigeria

Medical Physicists	Total
Radiotherapy	40*
Nuclear Medicine	4
Radiology	10
Total	54

IV. EDUCATION AND TRAINING

Medical physics education and training in Nigeria is mainly through postgraduate programs in the following Universities; Benue State University, Makurdi (Benue State), Federal University of Technology, Minna (Niger-State), Nasarawa State University, Keffi (Nasarawa State), Nnamdi Azikiwe University, Awka, (Anambra State), Obafemi Awolowo University, Ile-Ife (Osun State), University of Benin, Benin-City (Edo-State), University of Lagos (Lagos-State), and University of Nigeria (Enugu Campus), Enugu State. Three (3) new programmes will soon commence at the University of Calabar, Calabar, (Cross River State), Federal University, Lafia and the Usmanu Danfodiyo University, Sokoto (Sokoto-State).

This Program has in their curriculum Radiotherapy Physics, Radiodiagnostic Physics, Radiation Biology, Nuclear Medicine, Radiation Protection, Ultrasound, Dosimetry, Advanced Dosimetry, Anatomy, Physiology, Medical Statistics and some other few elective courses. These programmes are purely academic as no clinical training is attached to them.

Clinical residency training started in Nigeria in 2012, seven young physicists were selected from across various centres in the country to be the first set to go through the programme. This was being done through the IAEA supported country/national project NIR/6/023 (Developing the National Capacity to Train Medical Physicists to Support Radiotherapy Facilities in Tertiary Hospitals in Cancer Management). It involved clinical rotation between

National Hospital Abuja, Usmanu Danfodiyo University Teaching Hospital Sokoto, University College Hospital Ibadan and Ahmadu Bello University Teaching Hospital Zaria. It also has the NNRA’s SSDL in Ibadan on its list of clinical rotation sites.

The programme has been managed by the Federal Ministry of Health and was based on the IAEA TCS-37 (Clinical Training of Medical Physicists Specializing in Radiation Oncology) modules. It suffered several set-backs due to paucity of funds. Resources are currently being mobilized so that the first set of trainees whose number have now dwindled from 7 (seven) to 4 (four) can complete the programme thus, paving way for the second cohort of trainees who have appeared to have waited endlessly.

V. CONCLUSION

Medical physics training and practice in Nigeria has been very slow but steady. In the past year, it witnessed lots of young people being recruited into the profession. More graduates are also being churned out through the Master’s and Ph.D. programmes in the various universities earlier mentioned. With the new centres coming up in the country (both government and privately owned), It is expected that the practice is going to receive a boost in the coming years.

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