

FIVE YEARS OF INTERNATIONAL DAY OF MEDICAL PHYSICS CELEBRATION IN GHANA – THE EXPERIENCE

S. Inkoom^{1,2}, F. Hasford^{2,3}, J.H. Amuasi², A.K. Kyere², C. Schandorf², J.J. Fletcher⁴, E.C.K. Addison^{2,5},
M. Boadu^{2,3}, E.K. Sosu^{2,3,7}, T.A. Sackey^{2,3,7}, S.N.A. Tagoe^{2,6,7}, A.N. Mumuni⁸

¹ Radiation Protection Institute, Ghana Atomic Energy Commission. P. O. Box LG 80, Accra - Ghana

² Department of Medical Physics, Graduate School of Nuclear and Allied Science, University of Ghana, Atomic Campus. P. O. Box AE 1, Accra - Ghana

³ Radiological and Medical Science Research Institute, Ghana Atomic Energy Commission.
P. O. Box LG 80, Accra - Ghana

⁴ Department of Applied Physics, Faculty of Applied Sciences, University for Development Studies, Navrongo Campus, Navrongo, Ghana.

⁵ Oncology Directorate, Komfo Anokye Teaching Hospital, PMB, Kumasi – Ghana

⁶ National Centre for Radiotherapy and Nuclear Medicine, Korle-Bu Teaching Hospital, P.O. Box KB 369, Accra - Ghana

⁷ Physics Department, University of Cape Coast, Cape Coast. Central Region. Ghana

⁸ Department of Biomedical Laboratory Sciences, School of Allied Health Sciences, University for Development Studies
Tamale Campus, Tamale, Ghana.

Abstract— The celebration of the International Day of Medical Physics (IDMP) was instituted by the International Organization for Medical Physics (IOMP) in 2013. This initiative was aimed at promoting the role of medical physicists in the worldwide medical scene. During the celebration, national and regional member organizations join the mother organization (IOMP) to organize series of events to mark the day. In Ghana, the Ghana Society for Medical Physics which is affiliated to the Federation of African Medical Physics Organizations (FAMPO) and the IOMP has actively celebrated the IDMP in Ghana on every 7th November since its inception in 2013. This has given the medical physics profession a huge publicity in the country. Based on IOMP's theme for the year, the society selects appropriate speakers and topics reflecting the given theme. Previous speakers have included medical physicists, radiologist, radiation oncologist, nuclear medicine physician, radiation protection practitioners and oncology nurse. The background of participants at such events includes medical physicists, radiation protection practitioners, lecturers, radiologists, oncologists, regulators, allied health professionals, students, media and the general public. The IDMP celebrations in Ghana have been very educative and successful. It is vital that the medical physics society continues to keep engaging other health professionals, general public and media, by making them aware of the extremely dynamic and crucial role medical physicists play in the healthcare delivery with respect to diagnostic medical imaging, radiotherapy, nuclear medicine and radiation protection.

Keywords— IOMP, IDMP, Ghana, Medical Physics

I. INTRODUCTION

Medical physics practice in Ghana began in the 1970s when physicists were trained in developed countries (mostly in Europe) by the kind support of the Government of Ghana (GoG), International Atomic Energy Agency (IAEA) and other organizations [1]. Upon the return of the trained medical physicists, many of them practised with the Ghana Atomic Energy Commission (GAEC), a research institution

charged with the peaceful promotion and application of nuclear techniques. Some of the medical physicists also offered clinical services to hospitals. They undoubtedly contributed to the growth of the profession through education, training, clinical and research work [1, 2]. Their pioneering activities drew attention and interest to the medical physics profession, and subsequently influenced the establishment of two state owned radiotherapy centres in Accra, the capital of Ghana, and Kumasi, the second major city. Subsequently, a third radiation oncology centre which is privately owned has been built in Accra [1].

Currently, training of medical physicists in Ghana is done locally in order to provide the requisite work force for Ghana's radiotherapy, nuclear medicine and diagnostic radiology programmes. Plans are on-going to expand and upgrade existing infrastructure in radiotherapy practice by the introduction of advanced radiotherapy techniques and equipment. Equipment available in radiotherapy practice in Ghana include Co-60 teletherapy unit, linear accelerator, low dose rate (LDR) Cs-137 brachytherapy unit, high dose rate (HDR) Co-60 brachytherapy unit, LDR I-125 prostate brachytherapy system. In diagnostic radiology, there is transition from screen film radiology to digital radiology, with a significant increase of diagnostic imaging equipment, as well as mushrooming of private imaging centres. Imaging systems available in Ghana include computed tomography, magnetic resonance imaging, mammography, conventional X-ray, dental X-ray, dual energy X-ray absorptiometry (DEXA) and fluoroscopically guided X-ray equipment.

The local training of medical physicists started in 2004, with the introduction of M.Phil Medical Physics programme by the University of Ghana (UG). This was hosted by the School of Allied Health Sciences (SAHS) of the College of Health Sciences. In 2007, the programme was relocated to the Graduate School of Nuclear and Allied Sciences (SNAS) of the University of Ghana, and has since been hosted at the Ghana Atomic Energy Commission (GAEC)

campus of the University. SNAS was established in 2006 by collaboration between GAEC and UG with key support from International Atomic Energy Agency (IAEA). The goal of the School was to promote postgraduate university education and training for preservation and enhancement of nuclear knowledge in Ghana and Africa [3, 4]. In 2008, PhD Medical Physics was also introduced. With time, the Department of Medical Physics grew from initially admitting local students to admitting foreign students from across the Africa Region [2]. The department has become a hub of medical physics training in the sub-region, attracting a number of foreigners from some African countries. This has boosted the number of trained medical physicists locally in Ghana and other African countries.

II. GHANA SOCIETY FOR MEDICAL PHYSICS (GSMP)

In line with the statutes and byelaws of the International Organization for Medical Physics (IOMP), the Ghana Society for Medical Physics (GSMP) was established in 2011 with an ultimate aim of promoting the application of physics to medicine [5]. The Society serves as checks and balances on the activities of professional medical physicists and contributes to the training of medical physics students in Ghana. GSMP is mandated to regulate activities of medical physicists in Ghana as required by the Health Professions Regulatory Bodies Act 2013 (Act 857) [6]. At the International level, GSMP is affiliated to the Federation of African Medical Physics Organizations (FAMPO) and the IOMP. GSMP operates with a Constitution, Code of Ethics and Practice Standards, and achieves its objective through the following:

- Encouraging advancing and disseminating technical information, theory and practice of medical physics and related fields.
- Promoting a high level of ethical practice among medical physicists.
- Ensuring that medical physicists are engaged in technical procedures, which form part of patient care and treatment and
- Ensuring that medical physicists undergo certification examination and are licensed to practice.

Presently, there are about sixty-five (65) trained medical physicists in Ghana, with the distribution as clinical medical physicists (30%), medical physicists in academia (20%), medical physicists in research (15%) and unemployed (35%).

There have been capacity building programmes and projects in Ghana for the profession of medical physics such as;

- Academic, clinical and professional collaboration projects
- Participation in IAEA Technical Cooperation research projects
- Involvement in IOMP activities [7]

III. INTERNATIONAL DAY OF MEDICAL PHYSICS (IDMP) CELEBRATIONS BY GSMP

The IOMP instituted the celebration of the International Day of Medical Physics (IDMP) in 2013. This initiative was aimed at promoting the role of medical physicists in the worldwide medical scene where national and regional member organizations join the mother organization (IOMP) to organize series of events such as seminars, symposia and public lectures, and other activities to draw gatherings and for practitioners and the general public to receive in-depth information about the profession.

Since the inception of the IDMP in 2013 by the IOMP, the GSMP has actively celebrated the occasion in Ghana on 7th November of each year. The observance of the IDMP has given the medical physics profession a huge publicity in Ghana among other professional bodies such as Ghana Society for Radiologists, Ghana Society for Radiographers, Ghana Association for Radiation Protection, etc. and the general public. Based on the theme for each year, the Society selects appropriate speakers for its celebrations.

As part of the strategies to boost recognition of the IDMP celebration in Ghana, at least two weeks to the celebration, it is extensively publicized through banners and posters. Figure 1 shows the poster that was designed for the 2017 edition of the IDMP celebration in Ghana.

Table 1 Symposia for International Day of Medical Physics (IDMP) Celebration in Ghana from 2013-2017.

Year	IOMP Theme	Speaker/Topic	Summary of Presentations
2013	Radiation Exposure from Medical Procedures: Ask the Medical Physicist	Prof. C. Schandorf: <i>Radiation Exposure from Medical Procedures: Ask the Medical Physicist</i>	(i) Medical Physicist's role in the medical team for diagnoses and treatment of diseases (ii) Medical Physicist's involvement in equipment purchase, acceptance testing, commissioning, effective use & maintenance of equipment, quality assurance & quality control of medical procedures including dosimetry, protection of the patient, staff & public.
2014	Looking into the body- Advancement in imaging through Medical Physics	(i) Mr. E.C.K. Addison: <i>Role of Medical Physics in Ultrasound Imaging</i> (ii) Dr. A.N. Mumuni: <i>Role of Medical Physics in MRI Applications</i> (iii) Dr. A. Ankrah: <i>Nuclear Applications in Medicine (Nuclear Medicine)</i> (iv) Dr. S. Asiamah: <i>Computed Tomography Applications in Medicine</i>	(i) Physics Principles of Ultrasound Imaging (ii) Physics & basic principles in CT (iii) Application of CT in Medicine (iv) Physics of MRI & Clinical Applications of MRI (v) Safety in MRI (vi) Radioisotopes applications in imaging and therapy
2015	Better Medical Physics=Better Cancer Care in Radiation Oncology	(i) Dr. J. Yarney: <i>Better Cancer Care : Radiation Oncologist's Perspective</i> (ii) Ms. C. Muronda: <i>General Cancer Care in Radiation Oncology</i> (iii) Dr. J. K. Amoako: <i>The Role of the Regulator in Better Cancer Care Management</i> (iv) Mr. E.C.K. Addison: <i>Role of Medical Physicist in Better Cancer Care Management</i>	(i) Contribution of Radiation Oncology to Cancer Management (ii) Improved Imaging (iii) Advanced Treatment Techniques (iv) National Strategy for Cancer Control (v) Role of Efficient and Independent Nuclear Regulator in Cancer Management (vi) Requirements of Nuclear Regulatory Authority Act, (Act 895) (vii) Principles of Radiotherapy in Cancer Management (viii) Introduction of New Technologies & Challenges
2016	Education in Medical Physics: The Key to Success	(i) Dr. S. Inkoom: <i>Norwegian Partnership Programme for Global Academic Cooperation (NORPART) on Ghana-Norway Collaboration in Medical Physics and Radiography Education</i> (ii) Dr. M. Afadzi: <i>Sharing of Experiences as a Student in Norway</i> (iii) Prof. C. de Lange Davies: <i>Education and Training in Medical Physics: The Norwegian Experience</i>	(i) Education & training in (theory & practical) of Medical Physics, Radiation Protection & Radiography Education in Ghana & Africa. (ii) Academic Experience at Norwegian University of Science & Technology (NTNU) ; Teaching, Learning the Research Environment, & Student Life in Norway (iii) Biophysics, Physics and Medical Technology Program at NTNU (Master & PhD) (iv) Future of Medical Imaging, Nanoparticles Research with Ionizing Radiation & Ultrasound
2017	Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine	(i) Ms. T. Dery: <i>Female Medical Physicist: Global and Regional Perspective</i> (ii) Ms. V.D. Atuwo-Ampoh: <i>Radiation Safety Aspects Pertaining to Female Patients and Staff</i> (iii) Prof. M. Boadu: <i>Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine</i>	(i) Overview of Radiation Protection & Safety (ii) Principles of Radiation Protection (iii) Radiation Protection & Safety for the Pregnant Staff & Patient (iv) Contribution of Women in Medical Physics (v) Survey of Female Medical Physicists by IOMP (vi) Medical Physics Practice & Training in Ghana (vii) Challenges of Women in Science (viii) National Regulatory Infrastructure for Radiation Protection in Ghana (ix) Occupational Exposure in Radiation Medicine (x) Sources of Exposure in Diagnostic Radiology Nuclear Medicine & Radiotherapy (xi) Documentation of Radiation Protection Program (xii) Medical Exposure (xiii) Cancer Statistics in Ghana (xiv) Strategy for Cancer Management (Awareness & Screening Programmes)

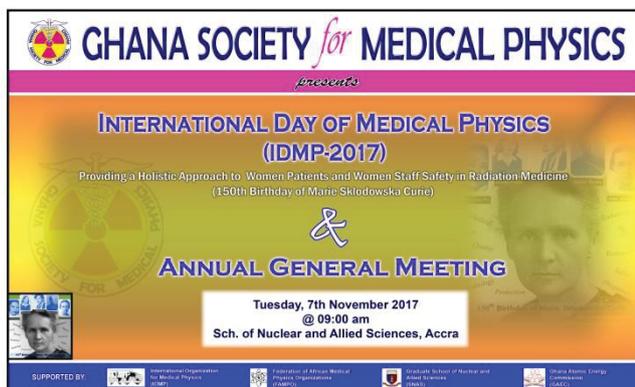


Fig. 1 Poster for the 2017 edition of the IDMP celebration in Ghana.

In addition, at the end of the celebration, journalists publish in the media a summary of what transpired during the celebration [8, 9].

A list of speakers and their topics reflecting IOMP's theme for the year is presented in Table 1. Figure 2 shows a group photograph of participants of the 2017 IDMP celebration in Ghana, under the theme "Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine", which was organized by the Ghana Society for Medical Physics.



Fig. 2 Group photograph of participants of 2017 IDMP celebration in Ghana organized by the Ghana Society for Medical Physics.

IV. CONCLUSIONS

For five (5) continuous years, GSMP has observed the celebrations of IDMP in Ghana. The celebrations have been very educative and successful. The participants have come from several backgrounds such as medical physicists, radiation protection practitioners, lecturers, radiologists, oncologists, regulators, allied health professionals, students, media and the general public. It is the expectation of GSMP that Ghana would use the IDMP celebration to influence the application of physics in medicine in health care delivery in Ghana and the rest of Africa.

ACKNOWLEDGMENT

GSMP is grateful for all the support received from IOMP, IAEA, FAMPO and other organizations towards the promotion and practice of Medical Physics in Ghana, and Africa.

CONFLICT OF INTEREST

The authors hereby declare that there is no conflict of interest in the publication of this article.

REFERENCES

1. Amuasi JH, Kyere AWK, Schandorf C, et al, 2016. Medical Physics Practice and Training in Ghana. *Physica medica* 32(2016) 826-830
2. Kyere AWK, Serfor-Armah Y, Amuasi JH, et al 2014. 10 Years of Medical Physics training in Ghana; Successes, Challenges and the way forward. *Medical Physics International Journal* 2(2) 418-419.
3. School of Nuclear and Allied Sciences, University of Ghana, Ghana, 2006.
4. Amuasi JH, Schandorf C, Nani EK., et al, 2011. Medical Physics in Ghana, Medical Physics and Engineering Education and Training Part 1, 205-207.
5. Ghana Society for Medical Physics. <http://www.gsmpghana.org/about-us/>: Date assessed: January 25, 2017.
6. Ministry of health. Health professions regulatory bodies act. (Act 857). Accra: MOH (Ghana):2013.
7. Kyeremeh PO, Acquah GF, Atuwo-Ampoh VD, et al, 2017. Capacity Building of Medical Physics in Ghana and Africa *Medical Physics International Journal*, 5(2)2, 156-161.
8. <http://www.ghananewsagency.org/science/application-of-medical-physics-still-crucial-in-contemporary-medicine-prof-amuasi--96852> Date assessed: January 25 2017
9. <http://www.newsghana.com.gh/young-students-urged-to-develop-interest-in-medical-physics/> Date assessed: January 25 2017

Contacts of the corresponding author:

Author: Stephen Inkoom
 Institute: Radiation Protection Institute, Ghana Atomic Energy Commission
 Street: Atomic Energy
 City: Accra
 Country: Ghana
 Email: sinkoom@gmail.com