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Benefit Exchange

A newsletter of *Medical Physics for World Benefit*

Medical Physics for World Benefit
www.MPWB.org
Working together for effective patient care

Inside This Issue

Guest contributor:

Philip Kyeremeh Jnr Oppong, PhD(c)
Global Center for Biomedical Science and Engineering, Graduate School of Medicine, Hokkaido University, Sapporo, Japan

Introduction

Greetings Physicists! To facilitate and encourage collaboration, we seek contributions describing both MPWB-affiliated and non-affiliated projects and updates that may be of interest to our readership. Examples include the work of IAEA, various international professional societies (ALFIM, AFOMP, EFOMP, *et al.*), non-governmental organizations like RadAid and Global Access to Cancer Care Foundation, and institutional teams. Our newsletter aims to highlight and connect individuals and organizations involved in improving physics in medicine internationally.

Global Awareness

As part of our effort to increase awareness and collaboration, we highlight a specific geographic region in each publication. In this issue we travel with medical physics doctoral candidate **Philip Kyeremeh Jnr Oppong** to his home country, the West African nation of Ghana, as he shares recent advances in medical physics practice:

Ghana is a West African country located just above the equator with the Greenwich meridian passing through Tema, its main industrial city. With a low and sandy coastline on the Gulf of Guinea, Ghana occupies a total area of 239,567 sq.km of tropical rain forest and several water bodies-including rivers, lakes and streams that extends northward from the coastline. Ghana is one of the leading countries across Africa partly due to a relative political stability, a fast-growing economy (with a nominal GDP at $74.26 billion per 2021 estimates) and a relatively evolving service delivery industry.

In response to the healthcare needs of a rapid population growth (currently logged at 31.07 million), there have been remarkable investments in the quantity and quality of healthcare delivery facilities as well as the development of human capital with both government and private investor involvements. Several schools and colleges have been established across the 16 regions of the country to accentuate commitments to improving healthcare and quality of life.

One of such is the setting up of the Graduate School of Nuclear and Allied Science's Department of Medical Physics, University of Ghana. The mandate of the Department has been to train medical physicists from Ghana and other African countries to feed into the continent's Radiological Science and Technology agenda in healthcare delivery.

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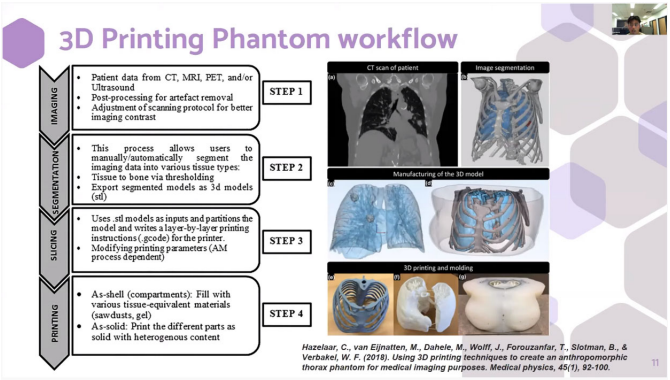
3D-Printing in Radiotherapy; Webinar Series

Moderated by **Sarah Ashmeg** and **Arjit Baghwala**, MPWB continues to host webinars on exciting topics. The most recent Webinar was a focused on 3D printing, with three speakers from Australia, **Prof. Tomas Kron** and **Dr. Rance Tino** from Peter MacCallum Cancer Centre in Melbourne and **Prof. Scott Crowe** from The University of Queensland in Brisbane. Professor Kron started the webinar with a review of the basics of additive manufacturing and a discussion of 3D-printing, "Needs, Governance and QA." Sharing his experience with printing bolus and the issues faced when implementing new, "disruptive," technology in the clinic – including regulatory aspects.

Dr. Tino shared an overview of the history of 3D-printing and the technology as applied to the development of radiotherapy phantoms. This includes work using medical scans to print anthropomorphic geometry, material investigations for tissue substitutes, and the development of modular phantoms. Professor Crowe shared a radiotherapy focused presentation on 3D printing of patient specific devices. With a detailed review on bolus, positioning devices, shielding, and brachytherapy applicators. Prof. Crowe covered device design, production, and quality management.



Above, Screenshot from Dr. Tino's presentation

Following the presentations, there was a rich discussion in response to questions from the live audience. It was an extremely informative webinar overall and you are encouraged to watch the recorded presentations: https://youtu.be/LKrsN1xsk8c

AAPM Global Needs Assessment Survey

The goal of the recently established International Council (IC) of the American Association of Physicists in Medicine (AAPM) is to identify and develop strategies for advancing the practice of medical physics globally, address disparities in healthcare and develop mitigation strategies in collaboration with other global stakeholders. To maximize the impact of the IC's work there is an urgent need to conduct a rigorous up-to-date needs assessment.

If you are an institutional or department leader in a Low to Middle Income Country (LMIC), the AAPM Global Needs Assessment Committee would appreciate your help in responding to this confidential survey. Responding to this survey is estimated to take about 15 minutes or less. If you have any questions about the survey, contact The Global Needs Assessment Committee at gnac@aapm.org.

If you are a staff member, please share this with your department head. A survey designed for medical physicists will be shared in the near future.

Take the survey: https://bit.ly/3Kz7Hbh
Please click on the link for additional information and to complete the survey. Also, please forward the link to other institutional and departmental leaders in your contacts.

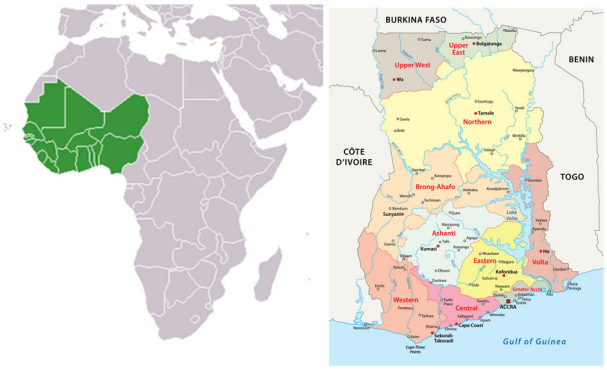
Rayos Contra Cancer, Seeking Volunteers

Rayos Contra Cancer (RCC) is a non-profit with the mission to improve cancer care in Low- and Middle-Income Countries (LMICs). They organize free, virtual training programs for radiotherapy professionals abroad. RCC is currently recruiting for more Medical Physics volunteers, who would like to use their experience to benefit patients around the world. Volunteering opportunities include: delivering live lectures, creating educational materials, and providing individualized support.

If you are interested in getting involved, please complete this form: https://bit.ly/rcc-mp

Continued, Awareness…

Since its establishment in 2006, over 100 medical physicists have been trained in the Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) programs at the University of Ghana in the capital city of Accra. These personnel are currently contributing on diverse fronts including clinical practice, research work, regulatory services and academic training of future physicists with an intended sustainability.

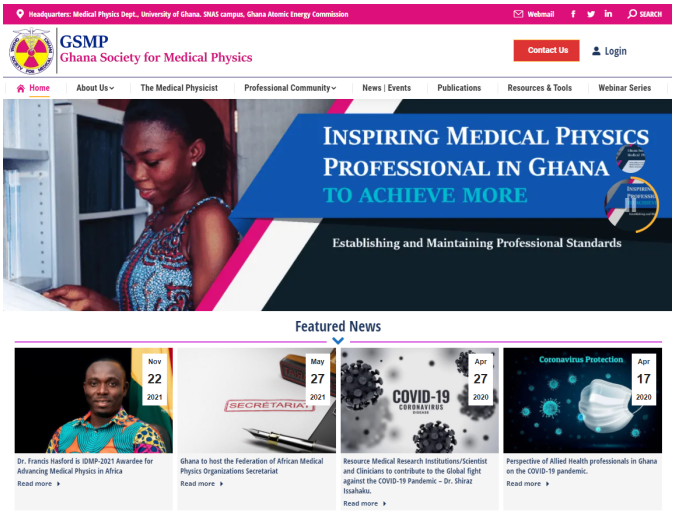


Left, 16 West African countries, Right, Ghana, which is centrally located in West Africa, on the coast of the Gulf of Guinea.

Nationals of other African countries have benefitted from both academic and clinical trainings in Ghana, and are leading major roles in their respective countries within Africa. This scope of practice of medical physics locally has seen remarkable improvements in cancer care delivery over the past few years. The new paradigm has occasioned new employment opportunities and appropriate recognition in the health service structure. These developments have been made possible owing to the implementation of requisite Legislation and Licensing backing the profession.

I. *Licensing and Regulating of Medical physicists*

Regardless of the remarkable impact of medical physics activities in Ghana dating back to the early 1970's, the profession has until recently faced major challenges and difficulties. The lack of a proper recognition of medical physics as a profession, backed and regulated by law had seen pioneer physicists recognized and remunerated as first degree biomedical scientists. Even more worrying was the trend where medical physicists were relegated to the background in major policy directions and decision making enterprises.



Above, Home page of the Ghana Society for Medical Physics, a well-organized and active group; https://www.gsmpghana.org/

Since its formation (in 2011) however, the Ghana Society for Medical Physics (GSMP) has worked closely with the Allied Health Professions Council (AHPC) of Ghana in regulating activities of the profession. The two bodies played a central role in the passage of the Health Professions Regulatory Bodies Act (ACT 857 of 2013), which fully supports the practice of medical physics as a medical profession in the country.

In satisfying all requisite conditions to practice as a clinical medical physicist in Ghana, the graduate of any recognized medical physics academic training program shall enroll in a two-year internship program coordinated by the GSMP in any of the approved radiation medicine clinical training facilities in the country. Upon completion, the personnel shall sit and pass a licensure exam organized by the AHPC with support from the GSMP board. Medical physics has been identified as one of the key areas that needs to be developed to improve healthcare. For many reasons, state-of-the-art technology cannot be applied uniformly around the world. There is a wide difference in emphasis and approach when dealing with developing countries. The challenges are manifold: it is first necessary to build the required infrastructure, then acquire equipment, attract qualified professionals, develop educational and training programs, and enact political policies for effective and accessible care within budgetary constraints.

II. *New Employment opportunities for Medical Physicists in Ghana*

The Ministry of Health (MoH) through the Ghana Health Service (GHS) has recently demonstrated a sound understanding of the urgent need to fully integrate medical physics practice into mainstream healthcare delivery. This was achieved through a broad stakeholder consultation between the GSMP, MoH and relevant state institutions such as the AHPC, Nuclear Regulatory Authority (NRA) and Fair Wages Salaries Commission (FWSC). Following from these engagements, the GHS in 2021 employed a total of 12 fully certified medical physicists across the country. Given the intentions of the GHS, medical physicists will be employed yearly across the country to offer specialized service in all health centers that employ radiological technology in the delivery of healthcare. Clearly, this has positioned the profession strategically to deliver on its mandate while heightening interests in its education programs.

III. *Career progression for medical physicist*

The recent positive outlook of medical physics practice in Ghana has been met with enthusiasm from practicing physicists, interns and students. Given the prospects, medical physicists in Ghana are highly motivated to fully explore their careers while contributing substantially to knowledge through advanced studies. This is seen in the increasing PhD enrollments. With the implementation of clearly defined professional growth and trajectories, many are motivated to develop specialist and consultant credentials, and hold future academic positions towards grooming the next generation of medical physicists.

IV. *GSMP and the African program*

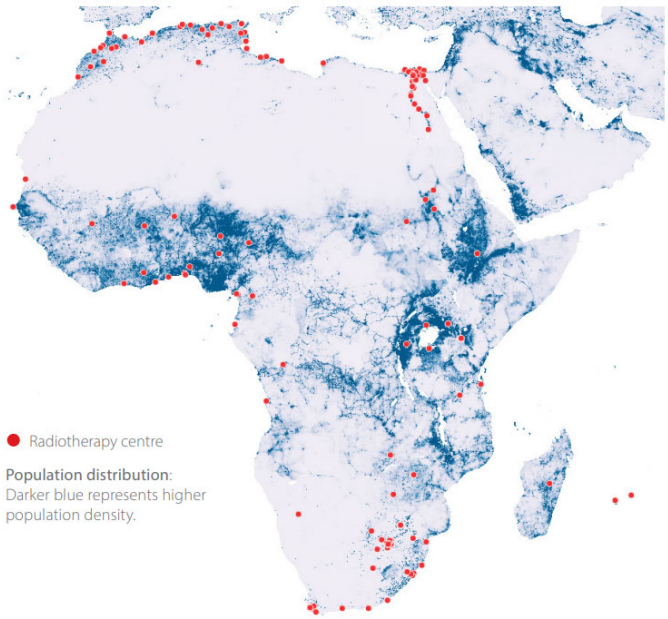
Across the continent, the profession is gaining acceptable recognition especially with major investments in Radiotherapy and Diagnostic Radiology. The IAEA's recommendation of developing African expertise has seen a number of faculty members and clinicians take up visiting professorship roles, technical experts' missions and employments in other African countries. This continues to cast a positive consequence on the profession locally.

Upon a unanimous decision, Ghana has recently (April 28, 2021) been announced by the Council of the Federation of African Medical Physics Organizations (FAMPO) to host the secretariat of the continental body. With the secretariat tasked with coordinating the activities of the federation towards promotion of medical physics on the continent, the GSMP is expected to deliver excellence beyond its educational, training and professional practice of medical physics. With this responsibility, there is a high expectation on GSMP attracting and holding projects in radiation medicine and continuing to deliver on its recognition as a leader in medical physics practice and training across Africa.

Editor's Note: Please feel free to reach out to Philip with collaborative ideas: **philipoppong.jnr@gmail.com**

IAEA, Rays of Hope

The International Atomic Energy Agency (IAEA) has recently launched the Rays of Hope initiative, dedicated to building cancer infrastructure in developing countries. On the African continent, over 70% of the population does not have access to radiation therapy. The IAEA currently has seven partner nations with plans to help with construction of state of the art radiotherapy centers, with multiple vaults and treatment modalities. The initiative is focused on sustainability, ensuring there is legislative support to maintain established levels of quality and safety. To learn more, visit the IAEA website: https://www.iaea.org/services/rays-of-hope



Above, Population density and radiotherapy centers in Africa