“It was the trip of a lifetime!”

Three graduate medical physics students traveled to Ghana for a five-week clinical training experience

Three students from the Perelman School of Medicine’s Medical Physics Graduate Program traveled 5,000 miles and a world away this past summer for an immersive clinical training experience in Ghana.

Ayoola Okuribido, **Lyna Dinh**, and **Andrew Friberg** spent a week of global health orientation at the University of Pennsylvania followed by four weeks rotating through Sweden Ghana Medical Centre and Korle-Bu Teaching Hospital in Accra then Komfo Anokye Teaching Hospital and Peace & Love Hospital in Kumasi. At the end of the training, they participated in an international symposium hosted by the Ghana Atomic Energy Commission (GAEC), the University of Pennsylvania and the Global Health Catalyst (GHC). While completing their clinical practicum requirement, the three learned about global health-related topics, gave presentations on their weekly clinical projects, and initiated an assessment on how AI can improve the clinical workflow in LMICs. In addition, they participated in excursions to fully immerse themselves in Ghanian culture.

This novel program’s goals are to enhance students' clinical skills in an international context; develop a greater appreciation of the factors that impact the health, education, and quality of life of communities in sub-Saharan Africa; strengthen partnerships for education and research between the U.S. and Africa; and provide global career opportunities.

The trip was a first-of-its-kind opportunity made possible through the newly funded Global Medical Physics Training and Development Program, which is sponsored by a three-year Penn Global Research and Engagement Grant and supplemented by funding from the Department of Radiation Oncology and the School of Engineering and Applied Science.

Here, in their own words, the three students describe their experience in Ghana.

Andrew Friberg
Third-year PhD student in Bioengineering with a Medical Physics concentration

“I was really excited to go to Ghana. I grew up overseas, and my parents worked for NGOs, which had a deep impact on me. In Ghana, I learned a lot from a global perspective that I don’t think I would have gotten anywhere else.

I found that radiotherapy is very limited in Africa. Fortunately, Ghana is fairly advanced in what it can offer patients compared to neighboring countries. That said, there are still many challenges.

At a place like Penn, you have seemingly endless resources, and our problems involve motion management or getting margins down to very small numbers. It’s a different set of challenges in Ghana, where they have staffing issues and older machines. The machines they use aren’t the latest models, but they’re reliable. That’s important because Africa is unfortunately very low on the priority list for vendors. In Ghana, it can take months for a vendor to send an engineer to fix a problem that is mission critical.

It was a privilege to observe Ghanaian physicists across multiple hospitals, including their use of Cobalt-60 machines. Despite challenges, the dedication of the physicists and their collaborations with engineering departments to solve issues and continue to provide patient care was inspiring.

For five days of the week, we were in the hospital working and on weekends we were doing cultural excursions or traveling. The opportunity to tour historical sites like El Mina Castle added a deeper understanding of Ghana's rich history. Ghanaians are some of the nicest people I've ever met and are very willing to spend their time with you. On more than one occasion, our Ghanaian colleagues dedicated their entire Saturday to driving us around and showing us various places. It's a very familial culture.

The first two days at each hospital were an adjustment period, where it felt like we were figuring each other out. They had never had a group from abroad come to shadow, but they were incredibly helpful. Around day three we started feeling more familiar and connected with them and by the fifth day you never wanted to leave the hospital.

The special part about this trip was that we got to see radiotherapy applied in settings with a lot of need but not much supply. The trip really grounded me in why the field of medical physics is important and why we do what we do, why we study, why we research, why we advocate. It was the trip of a lifetime."

Ayoola Okuribido
Second-year student in the Master of Science in Medical Physics Program

"I jumped at the chance to learn more about how Medical Physics is practiced in Ghana because I'm very passionate about global health and disparities in treatment outcomes. Over five intense weeks, the program allowed me to gain some hands-on treatment planning experience on different machines, software systems, and modalities.

We learned about HDR brachytherapy planning at Sweden Ghana Medical Center, Cobalt-60 planning at Korle Bu Teaching Hospital, and LDR brachytherapy planning at Komfo Anokye. We were able to observe some of the HDR procedures and even perform supervised brachytherapy afterloader and Linac quality assurance. At Peace and Love Hospital, we were able to observe a patient diagnostic CT and see some 2D mammograms. We were also fortunate enough to witness a pap smear and learn about ultrasound imaging.

The experience taught me a lot about the different parameters any clinician must consider when making decisions regarding cancer care. Since Cobalt-60 machines are not as common in the U.S., this was a novel opportunity for me to learn about teletherapy and the considerations involved. Our hosts were gracious enough to teach us as much as they could. And the knowledge we gained really helped put much of the things we learned in school into perspective.

Beyond the clinic, we also were able to explore Accra and Kumasi. We learned a lot about the history of Ghana and saw historical sites like the Kwame Nkrumah memorial museum, and the Boabeng Fiema Monkey Sanctuary. We also enjoyed a variety of Ghanaian foods like Waakye and Hausa Koko.

My biggest takeaway from the experience was the need to take a holistic approach to cancer care. I now understand the public health initiative and how pushes for periodic diagnostic or screening exams can

greatly contribute to reductions in cancer rates. I also understand many of the strengths and weaknesses of the linear accelerator and Cobalt-60 treatments.

As for where I see myself after graduation, I really want to contribute to the landscape of image guidance interventions in radiology as well as radiation oncology."

Lyna Dinh

Second-year student in the Master of Science in Medical Physics Program

"Professor Stephen Avery, who is a pioneer in global health, has introduced me to so many medical physicists around the world and unique opportunities like this one. Up until this trip, I had never lived outside of the U.S. for any kind of extended period, so I was excited to see how different life can be.

My interest lies in trying to make healthcare equitable in lower- and middle-income countries like Ghana. Through this experience, I learned that it takes a lot of resilience and working with what you have in these countries. Sometimes you don't have access to the resources like we have at Penn. The Ghanaians taught me to be more resourceful. They were making their own hardware for the machines themselves, something you don't often see in the U.S. Their ingenuity inspired me.

The average day in Ghana was very much case dependent. In the morning, we would arrive at the hospital around 8 a.m. They would tell us what our task was, either quality assurance tasks or planning a treatment and then we would get to work right away. Lunch was around 2 p.m. and we would spend this having casual discussions with colleagues. Then we either moved on to another portion of the experience, such as doing QA on a different machine or traveling somewhere to watch how a certain imager works.

The culture in Ghana is very family oriented, which I really enjoyed. People talk to each other, know a lot about each other's personal lives, and support each other whenever they can. I felt a camaraderie between us and the Ghanaians. They were very eager to teach us and even taught me some slang in their language. They were always willing to answer our questions, even if they were busy. And they were very open to learning from us as well. We were learning from each other.

I grew up in an immigrant family. My parents are from Vietnam. Hearing how they didn't always have access to great healthcare sparked my interest in global healthcare. Eventually, I'd like to work in lower-middle income countries like Vietnam and Ghana."