The Rwanda Anesthesia Residency Program: A Model for GME in Low- and Middle-Income Countries

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As other low- and middle-income countries, Rwanda faces the challenge of an insufficient number of physicians, including anesthesiologists. Over the last 12 years, using a dedicated collaborative group and innovative training methodology, the country has increased the number of anesthesiologists from 1 (in 2006) to 19 (in 2018), with an additional 42 residents currently in training. In this article, we describe lessons learned from this 12-year experience managing an anesthesia residency program in a low-resource setting.

At the beginning of 2006, the anesthesia residency program at the University of Rwanda was designed, based on a successful program in Nepal, to train sufficient Rwandan anesthesiology teachers by 2020 to be self-sufficient in educating additional anesthesiologists.[1,2] During this period, this residency program had to overcome a number of challenges.

Challenges Successfully Overcome

Lack of Teachers

Initially, the anesthesia residency program relied mainly on volunteer physician faculty from Canada and the United States. Each month a volunteer was assigned, most times with a resident, providing 1 to 2 full-time equivalent education staff for academic and clinical teaching. Since 2016, volunteers come on alternate months and work more closely with local staff to provide mentorship in teaching as the program approaches self-sufficiency in this area. In addition, senior residents are involved in the teaching and mentorship of junior residents in order to prepare the next generation of local faculty. A current final-year resident describes the involvement of residents in teaching: "Being a resident teacher to mentor junior residents is a wonderful and effective innovation. Both the mentor and the mentee have a benefit: they master the topics while improving teamwork and communication."

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Lack of Interest of Medical Students in Anesthesiology

Initially, only a few residents joined the program due to limited understanding of the specialty, long work hours, lack of mentorship, and few job opportunities.[3] In order to address that problem, in 2015 an organized recruitment system was introduced, which among other approaches, uses WhatsApp messaging to young physicians, and through a "snowball" method, asks interested people to pass information to colleagues. Now, the program has become much more desirable and, with 42 residents, among the largest at the University of Rwanda.

Lack of Structured Hands-On Training

In order to develop strong technical skills, the program started a low-fidelity simulation-based education program, where each resident trains at least 2 hours per week.

Lack of Exposure to Advanced Training

Skills like managing an efficient department, building a culture of safety, and some advanced procedures like anesthesia for heart surgery are difficult to teach in simulation. The Canadian and US national anesthesiology societies helped arrange short international rotations for a period of 1 to 6 months to enhance resident learning at the international level (at Dalhousie University, Stanford University, University of Pennsylvania, Cornell University, University of Virginia, and Virginia Commonwealth University in the United States). So far, 15 residents have benefited from those external rotations and reported excellent learning experiences. One resident who benefited from the external rotation describes this program: "During my rotation in the USA, I learned essential skills to provide high-quality anesthesia care. In addition, I learned the leadership and management skills necessary to run an effective anesthesia department. This is an essential component of our program,

and I suggest that every resident gets a chance to participate in this excellent program."

Lack of Research Mentorship

Residents are required to submit a thesis at the end of their training, but due to insufficient local mentors few have published their work. A new blended acute care operational research course has been established recently to address this. This course has been adapted from the World Health Organization endorsed Structured Operational Research and Training Ini-Tiative (SORT IT), and uses local and external staff to provide mentorship to residents enrolled in the course.[4]

Difficulty to Retain Graduates in Academia

As Rwanda still has few anesthesiologists, it is challenging to recruit academic staff, due to high demand in non-academic settings. In addition, 4 anesthesiologists have found international jobs, working mainly with Médecins Sans Frontières/ Doctors Without Borders and the International Committee of the Red Cross. In order to have sufficient academic staff, the University of Rwanda has appointed 4 senior residents to assistant lecturer positions in the department of anesthesiology; they will become faculty once they graduate and will help to achieve the objective of a locally run academic anesthesia program.

Despite the above-mentioned achievements, some weaknesses remain that need to be addressed.

Remaining Challenges

Lack of Local Subspecialty Training

After graduation, further professional development is needed for subspecialty practice. Currently, Rwandan anesthesiologists have to obtain fellowship training in Kenya, India, or Nigeria, and spend 6 to 12 months away from their patients and families. Seven anesthesiologists have completed such fellowships, mainly in areas of pediatric anesthesiology and intensive care medicine. Developing local fellowships can provide an opportunity to train more anesthesiologists from Rwanda and abroad.

Insufficient Engagement of Local Staff

With few anesthesiologists, there is a heavy clinical load and little time to prepare for teaching. In addition, there is no protected time for teaching and no incentives to encourage local anesthesiologists to teach. One senior resident proposes a solution to this problem: "There is a need to recruit more residents in order to graduate both academic and clinical anesthesiologists. Also, incentives are needed in order to motivate clinical anesthesiologists to be involved in teaching. Lastly, fellowship programs can contribute to the development of a teaching culture in the department." More advocacy at the university and government levels will be needed to improve engagement of local staff in teaching and to ensure sustainability of the program.

In conclusion, the Rwanda anesthesia program has grown from 1 to about 20 certified specialist physicians in 12 years through local training—a graduate medical education accomplishment that may be unmatched. Main factors in this success include dedicated teams in Rwanda, Canada, and the United States, clear long-term goals and a matching curriculum, and incisive and innovative approaches to identified problems. The 3-country collaboration is a great example of efficient and effective partnership. Importantly, this is not a stand-alone project: it is built on a successful program used in Nepal[2] and is currently being implemented in Ethiopia and Guyana, which shows the model's generalizability to other settings.

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