An innovative paradigm for surgical education programs in resource-limited settings

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SUMMARY

The burden of surgical disease in low-income countries remains significant, in part owing to continued surgical workforce shortages. We describe a successful paradigm to expand Rwandan surgical capacity through the implementation of a surgical education partnership between the National University of Rwanda and the Centre for Global Surgery at the McGill University Health Centre. Key considerations for such a program are highlighted.

In recent years, there has been an important shift in the practice of global surgery. The traditional paradigm, which once consisted in large part of service-provision missions involving temporary transfers of resources, has been supplemented, and in many instances replaced, by building long-term partnerships meant to augment local capacity. The latter is seen as the superior approach for tackling the substantial surgical disease burden and workforce needs of low- and middle-income countries (LMICs).[1,2]

In a combined effort to tackle these challenges, a partnership was created in 2010 between the National University of Rwanda (NUR) and the Centre for Global Surgery at the McGill University Health Centre (CGS-MUHC). Its aim is to augment Rwanda's surgical workforce, which in 2010 stood at 12 general surgeons for a population of 11 million, by expanding the academic component of the country's only existing and mostly service-based general surgery program.[3]

Following a joint needs assessment, an original system-based curriculum was created. The curriculum is centred on 2-week modules covering locally relevant general surgery topics, with Canadian surgeons who have relevant expertise functioning as moderators for the modules. Each module contains 6 hours of didactic lectures, 2 hours of case presentation, 2 hours of morbidity and mortality rounds and 1 hour of module evaluations, with operative teaching provided on elective operating room (OR) days and emergency cases. From program implementation in January 2011 to January 2014, 21 modules have been completed.

At the core of this project lie the concepts of local accountability and initiative. Importantly, this partnership stems from an invitation from Rwandan surgical leaders, allowing for a targeted intervention based on local needs rather than Western models and expectations. This principle extends beyond the program's initial conception, as its core, day-to-day operations are also under local governance. For this reason, Canadian surgeons have clearly defined responsibilities as moderators and educators, are responsible for only 2 of the 6 didactic lectures scheduled and are never asked to perform the clinical or academic responsibilities of local faculty or trainees, who remain jointly responsible for each module. In addition, their role is meant to be progressively effaced as current residents graduate and become educators, leading to gradual independence from foreign presence and strengthened local surgical capacity. This trend can already be seen in the continued implementation of academic activities during periods without Canadian presence.

Another prime concern for both partner organizations was to conduct early, context-appropriate and longitudinal assessments of the new project. As highlighted in a recent *Lancet* editorial, within the spectrum of activities conducted as part of global health initiatives, program evaluation is often "only an afterthought."[4] As a result, the relevance and outcomes of international interventions run the risk of being presumed rather than proven, and valuable input from local partners remains uncollected and unimplemented.[5] To avoid this development, an evaluation process was implemented at program onset. Initial evaluation consisted of an 8-item questionnaire distributed to Rwandan residents after every module. On review of their feedback, the questionnaire was replaced with a more critical 31-item survey. Further expansion led to the creation of a 36-item questionnaire addressed to participating Canadian surgeons. The issues surveyed range from curricular relevance, skill appropriateness and project logistics to cooperation between partners, operating experience and research collaboration. By involving local and international partners as both developers and participants of this evaluation process, we hope to not only encourage changes favourable to all parties, but also to secure partnership sustainability by fostering shared ownership of and responsibility for the project.

An important component of our approach to creating relevant, setting-specific evaluation instruments is that they be constructed alongside the program and subsequently adjusted and expanded as the program evolves. For this purpose, the initial resident questionnaire was limited in scope, serving mainly to confirm residents' acceptance of the curriculum and to provide qualitative feedback that would help identify shortcomings and issues important to participants. This information was used both to increase program quality and to expand and fine-tune existing evaluation tools, leading to the creation of larger and more relevant questionnaires, whose quantitative items now addressed newly recognized themes. In this manner, the frequent inability of residents to attend teaching activities owing to large clinical workload was identified and consequently addressed by instituting dedicated academic days; this adaptation resulted in an average 31% increase in attendance. Similarly, on learning that 65% of Rwandan residents desired increased operative teaching, this curricular component was expanded; this process was based largely on recommendations subsequently submitted in Canadian faculty questionnaires. A feedback loop was thus created in which program assessment serves to both improve the partnership and the evaluation tools themselves.

In addition to improving the learning experience of Rwandan residents, this program addresses one of the major obstacles to health care provision in LMICs: workforce retention. On completion of their studies, up to 22% of graduates from sub-Saharan medical schools migrate outside the continent, most commonly owing to financial considerations and to lack of postgraduate training in nations of origin.[6] Mature, in-country postgraduate training programs are more likely to reduce the need for foreign training while also generating locally relevant skill sets, augmenting the social accountability of trainees and providing potential hiring opportunities in education. The increase in the number of residents from 15 in 2010 to 21 in 2012 is encouraging in this respect.

Finally, this partnership further discounts previous cost-related misconceptions regarding global surgery that may have contributed to the prolonged lack of support for surgical interventions in sub-Saharan Africa.[7] Efficient use of funds concentrates resources on Rwandan output rather than on donor administrative costs and income replacement, maintaining high educational benefits for the relatively low cost of Can$2140.24 per module, with the NUR covering housing costs and the CGS-MUHC covering travelling costs.

Successful capacity-building paradigms are essential to tackle the burden of disease arising from injury and surgical illnesses in LMICs. Educational programs targeting local health care professionals at early stages of their careers are the cornerstone of such success. Our experience in building a surgical education partnership suggests that such a paradigm can enhance the success, vitality and longevity of like-minded capacity-building endeavours.

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Contributors: All authors have, at various stages, participated in the creation, implementation and evaluation of the surgical training program described in this commentary. Each author has also contributed to the design, drafting or editing of this commentary.

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