

INTERNATIONAL SURGERY

The development of postgraduate surgical training in Guyana

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Background: Like many developing countries, Guyana has a severe shortage of surgeons. Rather than rely on overseas training, Guyana developed its own Diploma in Surgery and asked for assistance from the Canadian Association of General Surgeons (CAGS). This paper reviews the initial results of Guyana's first postgraduate training program.

Methods: We assisted with program prerequisites, including needs assessment, proposed curriculum, University of Guyana and Ministry of Health approval, external partnership and funding. We determined the outputs and outcomes of the program after 2 years, and we evaluated the impact of the program through a quantitative/qualitative questionnaire administered to all program participants.

Results: Five residents successfully completed the 2-year program and are working in regional hospitals. Another 9 residents are in the training program. Twenty-four modules or short courses have been facilitated, alternating Guyanese with visiting Canadian surgical faculty members coordinated through CAGS. A postgraduate structure, including an Institute for Health Sciences Education and Surgical Postgraduate Education Committee, has been developed at the Georgetown Public Hospital Corporation (GPHC). An examination structure similar to Canada's has been established. Hospital staff morale is greater, surgical care is more standardized and academic opportunities have been enhanced at GPHC. Four regional hospitals have welcomed the new graduates, and surgical services have already improved. Canadian surgeons have a greater understanding of and commitment to surgical development in low-income countries.

Conclusion: Guyana has proven that, with visiting faculty assistance, it can mount its own postgraduate training suitable to national needs and will provide a career path to encourage its own doctors to remain and serve their country.

Contexte : À l'instar d'un grand nombre de pays en développement, la Guyana connaît une grave pénurie de chirurgiens. Plutôt que de compter sur l'enseignement qui se donne dans d'autres pays, elle a établi son propre diplôme en chirurgie et sollicité l'aide de l'Association canadienne des chirurgiens généraux (ACCG). Le présent rapport expose les résultats initiaux du premier programme de formation supérieure de la Guyana.

Méthodes : L'aide que nous avons apportée visait les préalables du programme avec l'évaluation des besoins, le programme pédagogique proposé, l'obtention du feu vert de l'Université de la Guyana et du ministère de la Santé, ainsi que la collaboration et le financement extérieurs. Nous avons jaugé les produits et les résultats du programme après 2 ans et évalué son incidence par un questionnaire quantitatif et qualitatif auquel ont répondu tous les participants.

Résultats : Cinq résidents qui ont mené à bien le programme de 2 ans et travaillent dans des hôpitaux régionaux; 9 autres suivent le programme de formation. On a présenté 24 cours de courte durée ou modules «assistés» avec des enseignants guyaniens en alternance avec des enseignants canadiens en chirurgie, le tout étant coordonné par l'ACCG. Une structure de formation supérieure avec notamment un *Institute for Health Sciences Education* et un *Surgical Postgraduate Education Committee* ont vu le jour à la *Georgetown Public Hospital Corporation* (GPHC). Une structure d'examen semblable à celle qui existe au Canada a été mise en place. Grâce à la GPHC, le moral est meilleur chez les membres du personnel hospitalier; les soins chirurgicaux sont plus uniformes et les possibilités de formation, plus riches. Quatre hôpitaux

régionaux ont accueilli les nouveaux diplômés et les services chirurgicaux se sont déjà améliorés. Les chirurgiens canadiens comprennent mieux et appuient davantage le développement de la chirurgie dans les pays à faible revenu.

Conclusion : La Guyana a prouvé que, avec l'aide d'enseignants de l'extérieur, elle peut organiser sa propre formation supérieure en fonction des besoins nationaux et tracer un parcours de carrière qui encouragera les médecins guyaniens à rester au service de leur pays.

Guyana and its population of 739 000¹ is nestled between Venezuela, Suriname and Brazil on the Caribbean coast of South America. Over the past 4 decades, political instability and a weak economy have triggered emigration of health professionals, many to North America. It is estimated that there are more than 100 000 Guyanese-Canadians, mostly living in the Toronto region.²

A small group of Guyanese surgical leaders were frustrated about the loss of so many of their graduates and identified the need for locally based surgical training. With limited faculty resources and no local experience with postgraduate training, a possible partnership was explored with 2 of us (D.P.S., R.H.T.) on behalf of the Canadian Association of General Surgeons (CAGS). This paper describes the development of Guyana's first postgraduate training program, a Diploma in Surgery, and the collaboration with Canadian surgeons facilitated by CAGS.

METHODS

One of us (R.H.T.) conducted a needs assessment in 2000 on behalf of CAGS.³ The University of Guyana (UG) Academic Board approved a Diploma in Surgery curriculum in 2004 and accredited Georgetown Public Hospital Corporation (GPHC) to deliver the training program. The 2.5-year course was aimed at training surgeons to meet the community general surgery needs in the secondary regional and district hospitals of Guyana and included a list of procedures that surgeons would be expected to perform with competence. In addition to clinical rotations at GPHC, the curriculum included structured tutorial modules conducted by Guyanese and visiting Canadian surgical faculty members.

The Canadian International Development Agency's (CIDA's) Canadian-Caribbean Cooperation Fund (CCF) accepted a funding proposal in March 2005. They agreed to provide \$142 000 over 3 years to cover CAGS visitors' travel expenses, local faculty honoraria and program development. Canadian visiting surgeons were recruited through liaison with the CAGS International Surgery Committee.

With everything in place to begin the program in October 2005, initial efforts to recruit general medical officers into the program were unsuccessful. The potential residents had concerns about the viability and credibility of the course

and their contractual arrangements with the Ministry of Health. The original expectation that residents would complete a 5-year contract was negotiated down to 3.5 years (including the 2.5-year training period), and the first 2 Canadian surgical visitors (including B.H.C.) led sample tutorial modules to confirm CAGS support. Subsequently, 5 residents began their training in May 2006. They had each already completed at least 3 years as house officers after graduating with their MBBS degrees from the University of Guyana.

The medical director of GPHC accepted the role of program director, and a Surgical Postgraduate Education Committee was appointed, including leaders from the UG medical school, hospitals, surgical faculty, Guyana Medical Council and Guyana Medical Association. An Institute of Health Sciences Education opened at the hospital with an administrator and office to oversee all hospital-based training programs for health workers.

We assisted with the development of an evaluation

Organizations mentioned in the text

Canadian Association of General Surgeons (CAGS) International Surgery Committee

- Facilitates participation of Canadian surgeons and residents interested in working in the developing world
- www.cags-accg.ca

Georgetown Public Hospital Corporation (GPHC)

- The main tertiary and teaching hospital in Guyana
- www.health.gov.gy

University of Guyana (UG)

- Guyana's public degree-granting postsecondary institution
- www.uog.edu.gy

Canadian International Development Agency (CIDA) Canadian-Caribbean Cooperation Fund (CCF)

- Strengthens public sector entities for the effective and efficient delivery of service
- www.acdi-cida.gc.ca

Canadian Network for International Surgery (CNIS)

- Nonprofit organization that promotes the delivery of essential surgical care to the underprivileged
- www.cnis.ca

Bethune Round Table on International Surgery (BRT)

- Annual scientific meeting devoted entirely to surgical issues in the developing world
- www.utoronto.ca/ois/BRT

process for the residents-in-training, including clinical in-training evaluation, regular tutorial module tests, case logbooks and final examinations. Faculty evaluated the program and in turn were evaluated by the residents. We established a regular web conference between Canada and Guyana, and Guyanese surgeons were invited to Canada to present papers at the Bethune Round Table (BRT).

We asked the trainees and Guyanese and Canadian faculty members to complete questionnaires about the impact of the training program on clinical services, surgical education and career development.

RESULTS

Outputs

All 5 residents successfully completed 2 years of training and passed final examinations. After 6 months of practice assessment in a regional hospital, they graduated in November 2008 with a Diploma in Surgery from UG. Nine additional surgical residents are currently in the training program.

By September 2008, 24 tutorial modules had been taught. Twelve CAGS visiting faculty each contributed 2–6 weeks of clinical and tutorial teaching over 19 visits to Guyana in 3 years. A Trauma Team Training course run by the Canadian Network of International Surgery (CNIS) certified 16 local faculty members, including the surgical residents. This led to an additional 60 providers being trained by local faculty members delivering 3 courses over the following 18 months. All residents completed advanced trauma life support, advanced cardiac life support and basic laparoscopy training courses. Canadian medical students trained Guyanese residents and faculty members to access the University of Toronto library online through the Ptolemy Project (www.ptolemy.ca), and CAGS surgeons donated textbooks to enhance the local Guyanese surgical libraries. Regular web conferences using Elluminate web conferencing software (www.lluminate.com) have allowed residents to present surgical topics and generate discussion with Canadian faculty members.

Three Guyanese faculty members and 3 Guyanese residents have presented papers at the BRT or the Canadian Surgery Forum. Short Canadian postgraduate fellowships in endoscopy, plastic surgery and trauma surgery are being planned for Diploma in Surgery graduates.

Outcomes

A local Guyanese structure for postgraduate training has been developed where none existed previously. This includes administrative and budget support staff, an Institute for Health Sciences Education at GPHC and initiatives to begin postgraduate training in anesthesiology and orthopedics.

A new Diabetic Foot Centre has been established in collaboration with one of the CAGS surgeons, and there are discussions about improving the burn unit and endoscopy services.

Impact

Surveys of Guyanese surgical faculty members have indicated improvement in staff morale, hospital services and standardization of surgical care (Table 1). Surgical services have been upgraded at regional and district hospitals, improving access to quality care for the Guyanese people outside of Georgetown. About 67% of faculty members agreed that this program model of specialty training is adequate to supply Guyana's regional needs for increased surgical human resources.

A career path has been developed for Guyanese medical students who want surgical training, allowing graduates to learn how to manage common surgical conditions with the resources available locally. Trainees have noted increased morale, good balance of academics and clinical service, benefits from learning standardized approaches and positive impacts by the visiting Canadian surgeons (Table 2). Eight (89%) trainees hope to obtain further training outside Guyana, and the same percentage intend to work long-term in Guyana.

All Guyanese faculty members responded that graduates of the program would be able to competently manage at least 50%–75% of common surgical conditions in an average Guyanese community. All 5 senior trainees also responded they felt competent to manage at least 75% of common community surgical conditions.

The CAGS surgeons (including B.H.C. and R.H.T.)

Table 1. Survey results of Guyanese faculty members (n = 9)

Statement	Agree or strongly agree,* no. (%)
Overall, the morale of the hospital staff on the surgical services has improved since the initiation of this surgical teaching program.	9 (100)
Being involved in this formal surgical teaching program has increased personal satisfaction in my surgical career.	8 (89)
Other, nonsurgical services of the hospital have been positively affected by the presence of this surgical teaching program.	7 (78)
The presence of this surgical teaching program has resulted in a more standardized approach to the care of surgical patients at the hospital.	7 (78)
My capacity and confidence in teaching has increased because of involvement in this program.	6 (67)
Professional interaction with visiting Canadian surgeons has had a positive influence on my capacity and confidence in teaching.	6 (67)
Academic opportunities (e.g., clinical research, presentations, publications, university promotion, continuing medical education) for me have increased because of the presence of this program.	7 (78)

*Based on a 4-point scale: strongly disagree, disagree, agree, strongly agree.

have contributed as mentors and have developed an increased understanding of surgical training in lower-income countries (Table 3).

DISCUSSION

There is a severe shortage of physicians and specialists in Guyana. There are about 5 physicians per 10 000 population (second lowest in the Caribbean) compared with 19 physicians per 10 000 in Canada.¹ Only 23 physicians registered by the Guyana Medical Council have obtained an overseas specialist qualification in the last 30 years.⁴ The public hospital system has about 1 surgeon per 100 000; Canada has about 4 times that proportion of general surgeons alone. To achieve a similar ratio, Guyana needs 30 more surgeons, not accounting for those who will emigrate, retire or enter private practice.

Guyana’s shortage of surgeons is not unique in the developing world. Physicians emigrate from low-income countries to developed countries for many reasons: economic, security, career development and family reasons. The World Health Organization has recognized the critical global shortage of essential surgical services in low-income countries.⁵ Worldwide, injury kills more than 5 million people annually, and an estimated 500 000 women die from pregnancy-related complications each year. These are conditions that can be prevented or corrected by surgery, especially in the district hospitals. Better surgical training should involve collaboration among academic institutions and professional associations with greater use of telemedicine and e-learning.⁶

Many Canadian surgeons are interested in serving overseas or have developed an ongoing commitment to international surgery. Lett⁷ has identified the key components of international surgery, including cooperation between nations in education, research, development and advocacy. Sustainable surgical education in the “south” requires a

curriculum that meets national needs, the training of local teachers and collaborating surgeons from the “north” who acknowledge joint responsibility for project success. One such example of collaboration in surgical training is the success of the Fiji School of Medicine in developing postgraduate training programs for the small countries of the South Pacific.⁸

The GPHC/UG Surgical Postgraduate Training Program was developed to train surgeons to work in the district community hospitals. Guyana’s Ministry of Health has maintained universal free access to a network of community health centres and district and regional hospitals. The 500-bed GPHC is its main teaching and referral centre. Deficiencies in surgical services at the peripheral hospitals have led to an overloading of the capacity of GPHC and inappropriate delays in surgical care when patients are transferred. Common general surgical problems include diabetic foot infections and trauma, with road traffic collisions and violence accounting for 10% of deaths.¹ The recently upgraded GPHC operating theatre accommodates more than 6000 procedures annually, 1000 of which are general surgery procedures.

In 1992, the UG medical school graduated its first cohort, and by 2005 it had produced 141 doctors. Most have emigrated to the Caribbean or North America, with only about 60 remaining in the country. There are 15–20 graduates annually, and currently there are about 200 Guyanese medical students in Cuba on scholarship. Most of those who pursued postgraduate training overseas in the Caribbean, North America or Britain have not returned. Those who have returned are busy, committed and usually combine their public hospital work with a private practice.

The Diploma in Surgery training program was started on the premise that postgraduate training should occur

Table 2. Survey results of Guyanese surgical trainees (n = 9)

Statement	Agreement,* no. (%)
Because of the establishment of this surgical training program the morale among the University of Guyana Medical School graduates has increased.	7 (78)
This surgical training program has a good balance between my needs for academic teaching and my needs for hands-on clinical experience.	7 (78)
In this program I have gained appreciation for and capacity in basic clinical research.	7 (78)
I have been learning a standardized approach to the care of common surgical conditions from my instructors.	8 (89)
Teaching by the visiting Canadian surgeons has been a positive part of this program.	9 (100)
The Elluminate web conference has been a worthwhile part of the surgical training program.	8 (89)

*Based on a 4-point scale: strongly disagree, disagree, agree, strongly agree.

Table 3. Survey results of visiting Canadian Association of General Surgeons faculty members (n = 10)

Statement	Agreement,* no. (%)
Professional interaction with the Guyanese teaching faculty was a positive one for me with mutual respect and learning.	9 (90)
From my discussions with the Guyanese staff and trainees and from my own observations it is my impression that there is a good balance between academic requirements and hands-on clinical experience in this training program.	8 (80)
I saw my role in the program as both mentoring the trainees and building teaching capacity among the Guyanese faculty.	8 (80)
There was general acceptance by the Guyanese faculty that my role was both mentoring the trainees and building teaching capacity among the faculty.	7 (70)
My understanding of the unique challenges facing surgical training in lower-income countries has increased because of involvement in this surgical training program.	9 (90)

*Based on a 4-point scale: strongly disagree, disagree, agree, strongly agree.

locally in Guyana. There are good reasons to support local training rather than send doctors overseas on scholarship to developed countries. Surgeons should learn about the surgical diseases in their own communities and need to know how to manage with the locally available resources (e.g., without magnetic resonance imaging or interventional radiology). These skills are also relevant to and honed by Canadian surgeons practising in more remote northern settings. Local training programs have other benefits to hospitals, since the residents continue to provide clinical service and become leaders and mentors for their hospital colleagues. Guyanese surgical faculty members noted that the “surgical residents are a model” with a “better attitude,” more accountability and “more regular auditing of care” and that “standards are up.”

One of the main concerns of the Guyanese faculty members and residents was the importance of setting a high standard of training and examination and providing a qualification that would be recognized locally and potentially internationally. The collaboration with CAGS has provided credibility and surgeons with clinical and educational expertise, although CAGS made it clear from the beginning that it is not an accrediting body. The association has provided support at the board level, access to the in-training examination, contact information to enable recruitment of volunteer Canadian surgeons and accounting support through its Ottawa office. The participation of CAGS as a partner organization allowed CIDA funding support to be secured. The partnership has meant that Guyanese faculty members, who are overstretched already with clinical responsibilities, have been able to share the teaching responsibilities with visiting Canadian surgeons for 8–10 weeks per year. The CAGS–Guyana volunteers have also assisted with the development of an evaluation process, monitored the progress of residents, compiled the final examination and served as external examiners together with a University of the West Indies external examiner. The final examinations included a written multiple-choice questionnaire and short-answer examination, as well as an oral examination with both internal and external examiners.

The original document submitted to the University of Guyana Senate included an outline of the curriculum, consisting of clinical rotations in obstetrics/gynecology, orthopedics, urology and neurosurgery in addition to the core general surgery and emergency department attachments. A series of tutorial modules was based on the STEP curriculum of the Royal College of Surgeons of England (www.rcseng.ac.uk/education/courses/STEPPProject.html), since multiple copies of the curriculum workbooks and readers had been previously donated to GPHC. The STEP course aims to prepare English surgeons for the MRCS exam, so it is clinically based and intended to be completed during the first 2 years of surgical training. This model provided a standard curriculum and resident evaluation process for the visiting and local faculty members. However, there were

disadvantages to using an imported curriculum; it was not always locally relevant, sometimes outdated and not in-depth enough in some areas. There is certainly a need for local faculty members, perhaps some of the first graduates of the program, to develop a local curriculum that will better meet the residents’ needs. In their comments, Guyanese surgical residents said that the “program is too service-oriented” with “little research,” but they appreciated the “exposure to evidence-based surgery” and a “structured approach” with “high-quality tutorial sessions.” They felt that CAGS surgeons helped create “a culture of professionalism and leadership.”

The CAGS surgeons have been enthusiastic and reliable. All visitors have returned home safely and in good health, with consistently positive reports and experiences. Some have been more involved in clinical activity than others, with the main focus of the visiting surgeon being the daily afternoon tutorials with the residents. One Guyanese surgeon commented that “CAGS brings a different culture — competent but not arrogant.” Visiting CAGS surgeons were “impressed by the breadth and depth of staff experience” but sometimes felt that “most of what I could teach isn’t really applicable (advanced laparoscopy, endoscopy etc.)” They appreciated the “keen, enthusiastic trainees” but recognized that the “clinical service component for residents is almost unmanageable.” It was suggested that Canadian surgical residents on elective could “bring academic knowledge and in return gain unlimited clinical experience.”

The dependence thus far on outside funding raises concern about the future of the training program once the CCF funding ends in 2009. However, it is likely that expatriate surgical visitors and external funding will still be necessary for several years to assist in teaching and local faculty development. Other new collaborative models (e.g., CNIS member projects) are being explored to maintain and even increase the number of CAGS visiting surgeons to Guyana. As the program evolves, specific needs have been identified that will require additional training projects (e.g., diabetic foot management, endoscopy, basic laparoscopy, burn care). Canadian surgical residents may also benefit by visiting Guyana on elective.⁹

All of the current trainees have stated their intention to remain in Guyana. Retention of graduate surgeons in the country’s public health system will depend on many factors, similar to Canada’s challenges recruiting doctors to remote areas. Issues such as security, salary, professional development opportunities and family obligations must be considered. Currently, each Guyanese graduate has committed to an additional year of service in the Ministry of Health after completing their surgical training, which adds up to more than 6 years of post-MBBS public service, including their presurgical service. It may be unrealistic to expect doctors in developing countries to sign long-term contracts to work in their remote regional hospitals after training (especially when Canadian graduates have no such

obligation). Promotion in the public hospital system will depend on recognition of the diploma by the Guyana Medical Council and the Ministry of Health. Because both organizations have been involved since the conception of the program, it is anticipated they will be fully supportive in recognizing the capacity of graduates to work independently as surgical consultants. Graduates expect to be able to also undertake private practice, as do their colleagues.

Is this program replicable in other larger developing countries or regions? This diploma course was a local solution to a national crisis and may not be applicable in other countries with differing needs and resources. Some have developed longer courses (4–5 yr) of training leading to a masters degree (e.g., Fiji School of Medicine⁸) or an accredited fellowship (e.g., College of Surgeons of East, Central and Southern Africa, www.cosecsa.org). However, there are basic principles demonstrated by this program that could be applied to all efforts to train surgeons in the developing world. Surgical training should reflect national needs and available faculty and focus on management of local diseases using available resources and could involve western surgeons as collaborators. Compared with sending doctors away for postgraduate training, a high-quality local qualification needs fewer resources and avoids the loss of doctors to the public service during their training. Surgeons trained in a North American highly specialized 5-year program are not appropriately prepared and may not be able to function as surgeons in the developing world.

External accreditation of the Guyana training program has not yet been sought, but there have been discussions with surgical leaders at the University of the West Indies. As graduates of the Diploma in Surgery program prove their mettle, it is anticipated that some will seek further training in the Caribbean or short electives in North America. The stature and further development of the

training program will be in the hands of the keen and capable residents — now surgeons — who are the focus of this CAGS–Guyana project.

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Contributors: All authors helped design the study. Dr. Taylor acquired the data, which he and Dr. Cameron analyzed. Dr. Cameron wrote the article; Drs. Rambaran, Sharma and Taylor reviewed it. All authors approved final publication.

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CORRECTION

In the June issue of the *Canadian Journal of Surgery*, the title of the online Case Note by Gandhi et al. was incorrect. It should have read “Cemented bipolar hemiarthroplasty in osteopetrosis for failed femoral neck fixation.” The correct citation is as follows:

Gandhi R, Salehi M, Davey JR. Cemented bipolar hemiarthroplasty in osteopetrosis for failed femoral neck fixation. *Can J Surg* 2009;52(3):E44-6.