



## Pediatric surgical camps as one model of global surgical partnership: A Way Forward



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### ABSTRACT

**Background/Purpose:** A uniquely Ugandan method of holding surgical “camps” has been one means to deal with the volume of patients needing surgery and provides opportunities for global partnership.

**Methods:** We describe an evolved partnership between pediatric surgeons in Uganda and Canada wherein Pediatric Surgical Camps were organized by the Ugandans with team participation from Canadians. The camp goals were to provide pediatric surgical and anesthetic service and education and to foster collaboration as a way forward to assist Ugandan health delivery.

**Results:** Three camps were held in Uganda in 2008, 2011, and 2013. A total of 677 children were served through a range of operations from hernia repair to more complex surgery. The educational mandate was achieved through the involvement of 10 Canadian trainees, 20 Ugandan trainees in surgery and anesthesia, and numerous medical students. Formal educational sessions were held. The collaborative mandate was manifest in relationship building, an understanding of Ugandan health care, research projects completed, agreement on future camps, and a proposal for a Canadian–Ugandan pediatric surgery teaching alliance.

**Conclusion:** Pediatric Surgical Camps founded on global partnerships with goals of service, education, and collaboration can be one way forward to improve pediatric surgery access and expertise globally.

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There are recognized need and desire to assist in the delivery of surgical care, especially to children, in countries where there are scarce clinical resources and a deficiency of trained subspecialty surgeons [1–3]. To that end, over the years many models of assistance and surgical partnerships have been devised wherein services and education may be afforded to low income nations. These have taken different forms; from individual surgeons simply spending time in those countries providing what service they can, through to mission-surgical teams that arrive, operate, then leave, to remote partnerships forged through social media connections that realize surgical help and knowledge-sharing enacted over the internet [4,5]. All have their advantages and disadvantages. All have been variously praised and criticized [6,7] and there must be no mandate for

absolute perfection because that is surely unachievable. The question of what model of global surgical assistance and partnership is ideal may not be currently- or ever-answerable, but in the quest for the best paradigm we present herein our evolved model for international cooperation in pediatric surgery.

Uganda is ranked 161 out of 187 countries according to the 2013 Human Development Index (HDI). The HDI is based on standard measures of “three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living [8].”

With a population of just under 35 million, approximately half of the citizenry of Uganda is less than 15 years of age [9]. Canada, with a population just over 35 million and only 17% of its population less than 15 years of age [10], has more than 60 specialty-trained pediatric surgeons [11]. Uganda has two.

This is a retrospective study the purpose of which is to describe the evolution over the past 11 years of what has developed into what we believe to be a workable model of global surgical partnership. This

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model has evolved with three evident pillars in its mandate: service, education and collaboration.

## 1. Methods

A uniquely Ugandan method to help deal with the sheer volume of patients needing surgery, sanctioned and encouraged by the Association of Surgeons of Uganda, is to stage surgical “camps” throughout the country wherein surgical personnel travel to and gather for a week or more in one community, providing surgery to individuals in need, free of charge [12]. A collaboration between two pediatric surgeons, one a Canadian (GB) and the other a Ugandan (DB-M) was initiated following their first meeting in 2002 in Uganda. This collaboration strengthened over the subsequent years following a number of visits to each other's countries and health centres. In 2007, a plan was discussed and agreed upon to collaborate in a “Pediatric Hernia Camp” in 2008. This was to be held at Mulago Hospital in Kampala, the university teaching hospital of Makerere University School of Medicine and Uganda's main tertiary referral centre. As indicated by its title, the focus of surgical activity was on the repair of children's hernias. There were to be a Canadian team and a Ugandan team to work in the camp in partnership. It was the first of three subsequent Canadian–Ugandan pediatric surgical camps (PSCs) held in Uganda; in 2008, 2011 and 2013.

The PSCs' aims were to provide (1) Service: specialized pediatric surgical services free of charge to Ugandan children (2) Education: knowledge and skills transfer for Surgery, Anesthesia and Nursing personnel of both nations (3) Collaboration: other collaborative opportunities in the realms of research, training, etc.

The respective roles for the Canadians and Ugandans in each of the PSCs were established prior to each PSC. Both the Ugandan and Canadian partners brought both human resources and project supplies to the camps. Upcoming PSCs were advertised regionally through radio announcements and by word-of-mouth. Posters advertising the camps were also displayed throughout the Kampala region and, in the case of the 2011 PSC, also in the Bushenyi/Ishaka region in western Uganda. Patients for the first camp in 2008 were screened in a Mulago surgical clinic by the Ugandan surgical teams where, prior to the camp, patient records were established, operative consents prepared, and clinical details recorded. In the subsequent PSCs, 2011 and 2013, both the Canadian and Ugandan teams participated variably in the initial screening of prospective camp patients, with as much as possible relevant clinical detail shared and discussed prior to the camp via email. A cadre of Ugandan general surgeons, pediatric surgeons, urologists, surgical trainees, surgical nurses, staff anesthesiologists, anesthesiology trainees and anesthesia officers who would participate in each PSC was recruited and the terms of their participation were established. Operating theatres at Mulago (and Ishaka in 2011) were

reserved for use for each camp. For each PSC the Canadian team consisted of a senior pediatric surgeon, a senior pediatric anesthetist, a pediatric surgical fellow, a pediatric anesthesia fellow and/or resident, at least two experienced surgical/peri-operative nurses, a team manager/logistician and a child-life worker. In addition, there were variably, a general surgical resident, two pediatric urologists, a pediatric urology fellow, a surgical nurse practitioner, and two senior medical students. Ugandan medical and nursing licensure was obtained for all the Canadian team members prior to the camps. Funding for the camps was mutually raised and donated supplies gathered in both Canada and Uganda from many sources. Thus the travel and accommodation were provided for, where required, of all the PSC team members, both Canadian and Ugandan. The Canadian team also brought as much surgical and anesthesia equipment and supplies as they could travel with. Both teams provided anesthesia drugs, antibiotics, sutures and other expendables as needed.

## 2. Results

Table 1 summarizes the output of each of the PSCs under the three rubrics of their agreed upon mandates; Service, Education and Collaboration.

### 3. PSC 2008

The 2008 camp was focused on pediatric hernia repairs only and over a week at Kampala's Mulago National Referral Hospital, with 5 operating days only, 350 children had their hernias repaired. The ages ranged from < 1 year to 14 years and all children presented with hernias for repair. The Canadian team operated on 78 of the 350 children. Most patients were discharged within 24–48 h from the ward. The Ugandans undertook the longer-term follow-up. There were no deaths.

Trainees involved in this camp included a Canadian pediatric surgery fellow, a Canadian pediatric anesthesia fellow, four Ugandan anesthesia trainees and one Ugandan general surgery trainee. There were one formal educational lecture delivered, and a few, spontaneous and informal nursing, anesthesia and surgery care teaching sessions. From a collaborative point of view, this initial camp served to inform the Canadian team members about the Ugandan healthcare system. It was an important relationship and trust-building experience where, with a very demanding schedule of patients each day starting at dawn and finishing well after sunset, we got to know each other, both professionally and personally. Through this close working relationship we mutually agreed to partner on future PSCs.

### 4. PSC 2011

There were agreement and planning for a subsequent 2010 PSC in Uganda that had to be deferred to 2011 because of a temporary health

**Table 1**  
A summary of the Service, Education and Collaboration outputs for the 3 PSCs.

	Service	Education	Collaboration
2008	Hernia repairs, 350 children	2 Canadian trainees, 5 Ugandan trainees, Informal teaching sessions 1 lecture	Relationship-building, Understanding Ugandan healthcare system, Agreement on future camps
2011	Hernia repairs + complex cases, 220 children	3 Canadian trainees, 7 Ugandan trainees, Numerous medical students (2 European, many Ugandan) Tutorials	2 research projects completed Agreement on a future camp
2013	Complex pediatric surgery and urology cases, 107 children	5 Canadian trainees, 8 Ugandan trainees, Daily lectures/formal rounds Tumour board participation	1 educational research study completed 1 joint research proposal drafted, Proposal for Ugandan–Canadian training alliance, 2014 Rural Uganda PSC planned

issue with one of the team members. The 2011 PSC was planned to span two weeks, the first week at Mulago and the second week in the more rural setting of Ishaka in western Uganda at the Kampala International University (KIU) teaching hospital. Again, many pediatric hernias were repaired, but in this PSC the surgical treatment of some complex pediatric surgical conditions was undertaken. These more complex cases included sacrococcygeal teratoma excisions, numerous colostomy revisions and intestinal fistulae repairs, and imperforate anus repairs. Over the span of the two weeks, a total of 220 children were operated on with the Canadian team doing 44 operations. Patients were admitted to the surgical wards for post-operative care and were rounded on by both teams in partnership daily. There was one death, in Ishaka, the cause unknown, following a straightforward hernia repair by the Canadian team. An autopsy was not consented to.

Trainees involved in this PSC included a Canadian pediatric surgical fellow, a Canadian general surgery resident, a Canadian anesthesia resident, two European elective senior medical students who joined the camp as helpers in the first week and stayed with us till the end, three Ugandan general surgery residents, four Ugandan anesthesia residents, numerous Ugandan (KIU) medical students in Ishaka and one KIU intern. Again, there were a number of informal teaching sessions amongst the surgical, anesthesia and nursing personnel. There were no formal lectures, but one planned surgical technique tutorial. Along with continuing to foster good international collaboration and friendship amongst the team members during this camp, two joint Ugandan–Canadian surgical research projects were also completed. Serendipitously during this camp, we encountered a small team of American volunteer urologists who were in Kampala during our first week of the camp. There were two pediatric urologists in that group who fortuitously were able to participate with us in Mulago on some of the more complex cases (disorders of sexual differentiation/intersex and cloacae). Two of the Canadian team members stayed in Uganda for three days beyond the end of the camp and rounded on the patients. The Ugandans, who communicated the outcomes to the Canadian team members by email, did the long-term follow-up. Once again, there was mutual agreement to undertake another future Uganda PSC, with the promise that the two encountered pediatric urologists would also be future team members.

## 5. PSC 2013

This subsequent PSC took place in 2013 and was organized to be entirely devoted to undertaking complex pediatric surgical cases. We were indeed fortunate to have with us the two pediatric urologists with whom we had worked with in 2011, along with a Canadian pediatric urology fellow. Their participation, along with the expertise of the Ugandan pediatric urologists on this PSC allowed us to deal more effectively and jointly with the complexities of such cases as cloacae and intra-abdominal cryptorchidism. Additionally, their expertise and the specialized pediatric urologic equipment they brought allowed for a number of males with posterior urethral valves to have their long-term vesicotomies to be closed and a number of children with complex hypo- and epispadias to undergo repair. In this PSC, unlike the two previous, the majority of the patients were operated on and anesthetized by joint Ugandan–Canadian teams which allowed for a great deal of knowledge and skill-sharing. One hundred and seven children received surgical care during this PSC. There were no deaths.

The trainees in this PSC included a Canadian pediatric surgical fellow, a Canadian pediatric urology fellow, a Canadian general surgery resident, a Canadian pediatric anesthesia fellow, a Canadian anesthesia resident, as well as two Ugandan general surgery graduates working in the hope to become pediatric surgeons, two Ugandan general surgery residents, and four Ugandan anesthesia trainees. There was a commitment in this PSC to have daily formal morning educational rounds wherein surgical, urological, and anes-

thesia topics were presented and ideas shared. The Canadian team members were also able to participate with the Ugandans in two pediatric tumour board sessions. There were twice daily ward rounds by all team members. In addition there was closer team-based pre- and post-operative management as compared to the previous camps. Longer-term management and follow-up were discussed over email with the Canadian team members. There were no deaths and all patients were discharged. In particular, during this camp, a nine-day old baby with esophageal atresia and distal tracheo-esophageal fistula was admitted in extremis. Survival with this condition in Uganda has been a rarity. The baby was surgically operated on and managed by a joint team of Ugandans and Canadians and survived to be taking full nourishment by mouth and discharged from hospital shortly after the PSC closed. Collaboration outcomes of this PSC saw the completion of one Canadian educational research project and the formulation of a joint Ugandan–Canadian research proposal as well as the promise and early plans made for a rural Canadian–Ugandan PSC in eastern Uganda in 2014. Significantly in this upcoming PSC, the Canadian pediatric surgical fellow who participated in the 2011 PSC will be the staff Canadian pediatric surgical lead. Lastly, stemming from this 2013 PSC is the proposal for a Canadian–Ugandan pediatric surgery training alliance with the proposal that young Ugandan general surgeons wishing training in pediatric surgery can receive a significant portion of that fellowship training at our Canadian training centre.

## 6. Discussion

There is no doubt that interest in international surgery is on the rise. Trainees in surgery especially seem to have a burgeoning interest in getting involved in international surgical efforts, especially where those efforts could potentially assist surgically deprived populations [13–16]. Farmer and Kim, founders of Partners in Health and acknowledged authorities in global health inequities, in an effort to call attention to the surgical needs of poorly resourced populations, have labeled surgery “the poor stepchild of global health.” In their 2008 article, “Surgery and Global Health: A View from Beyond the OR,” they signal the need to act on the surgical needs of many in low-income nations but also note the perceived problems and criticisms of the international partnerships and the short-term missions. They provoke thought in saying they “would not suggest abandoning short-term medical missions. Rather, how can we do them better [3]?”

Wright et al. in a 2007 paper, with extensive experience in working with cardiac surgery, plastic surgery and otolaryngology partnered teams in developing countries, the authors listed some lessons they learned for ensuring effectiveness of such ventures. We may now look at that list in light of our PSC experience [7]. Firstly, Wright et al. speak of the importance of the initial contact being founded on individuals with a shared interest. Our model of partnership did stem from the 2002 meeting of two pediatric surgeons, one a Ugandan and one a Canadian. The PSCs, and our pediatric surgical partnership trace their origins to that first individual, as opposed to institutional, contact.

Some surgical projects in other lands see teams from resourced countries sweep in, operate and soon fly out with little, if any, involvement of the local expertise. From the first inception and through the evolution of our PSCs, from the initial invitation through to the on-the-ground organization and development, the Ugandans have been central in the process. It has been through their initiative and their unique ‘surgical camp’ methodology that this global pediatric surgical partnership has developed and gained success.

Wright et al. go on to speak of the importance of thoughtfully respecting and understanding the uniqueness of the local health situation, both its pathologies and its sociopolitical aspects. For instance, we certainly quickly learned the differences in Uganda with respect to stoma care in children where stoma appliances are not

readily affordable. Shaped candles were used effectively instead of Hegar dilators, or better yet, the imperforate anus repairs were constructed in such a way to hopefully obviate the need for anal dilations. There were many other 'local' health issues that we had to learn about, from the prevalence of malaria and how it can affect the surgical care of children, through to the high incidence of typhoid perforations of the bowel that we learned of and helped treat. The knowledge and skill transfer was very much a two-way phenomenon in our Canadian–Ugandan partnership.

Team members from both the Canadian side and the Ugandan side were carefully selected and their duties outlined. We felt it was important for our traveling Canadian team to be small enough to work closely and cooperatively together as one unit with an all-important esprit de corps. Although there are many interested and willing individuals eager to participate and travel with global teams such as ours, there is a real threat of forming too large a team. This could result, we felt, in overwhelming our Ugandan hosts by sheer numbers and causing discomfort. Our teams were small enough to have regular meetings together with our Ugandan partners, on the fly, to discuss the sudden issues that arose of patient order, resource management and even the ethics of apportioning care with limited time and resources. Everyone had to feel they had a say. We purposely had regular debriefing sessions so that issues that needed discussion would not fester. It is important for all team members to understand that differences of culture and methods in settings of international partnerships may easily cause tensions. Partially for that reason, as a key member of the team, we incorporated a project logistician who helped facilitate and actualize the partnership's service, educational and collaborative goals. Similarly, our team included a child and family support worker who had the all-important job of continually humanizing the day-to-day scramble of large lists of children needing operations and helped to interface with worried families.

As we planned for our second and third PSCs we realized the need to have both experienced individuals included and 'new blood'. If partnerships are to succeed, flourish and carry on then deliberate thought must be given to how the baton of enthusiasm and experience is passed along. Starting with a Pediatric Hernia Camp and then progressing through the subsequent second PSC, which was a hybrid collection of hernia cases plus some complex cases, through to the third PSC which was all complex pediatric surgical cases, was invaluable as it afforded the Canadian team members the time and experience to gradually learn the local conditions. How the wards and the operating theatres worked was somewhat mysterious to the Canadian team members at first, and it was good for them not to be faced with daunting tertiary cases in a foreign setting right from the start. Such challenges as the variability of the power supply in Ishaka and the lack of a muscle stimulator for anal mapping in Mulago encouraged invention. Groups of observing medical students with flashlights and a jury-rigged anesthesia nerve stimulator served us well [17].

Apart from what small surgical tools, anesthesia drugs and disposables, including sutures, the Canadian team could transport with them on their flight to Uganda, the PSCs were dependent on the local Ugandan surgical equipment. There was a concern that in some instances the drugs used from the Ugandan hospital stock may have been substandard, for example, local anesthetics that were evidently ineffective. The extent of the problem in sub-Saharan Africa of substandard, or even counterfeit drugs, including antibiotics, is unknown, yet alerts have been raised for some years now [18]. Along with what tools the Canadian team could add to the PSC supply, they also modeled the peri-operative safety standards and checklist approach at the camps and were gratified to see the younger Ugandan surgeons and anesthesiologists also modeling the same. The mutual use and reinforcement of that most basic of safety standards hopefully demonstrate its international acceptance as the norm for all operations.

Funding for the PSCs on the Canadian side was strictly budget-based, with the needed monies raised through appeal and desire by individual and group donations along with donations-in-kind of surgical disposables and materials such as sutures. Of course, as should always be the norm, absolutely no expired drugs or materials were utilized. Small local fund-raising events were helpful as well. As yet, no charitable or institutional organization has adopted the PSCs or our pediatric surgical partnership and perhaps that concept should be explored.

We believe that rather than making research as a primary mandate for our pediatric surgical partnership, it will spring from, and indeed has already been a product of, our collaboration. Through the PSCs, we have studied the costs of pediatric hernia repairs, completed a small project studying video replays as a teaching technique for Ugandan surgical trainees, as well as researching the utility of CanMEDS (© Royal College of Physicians and Surgeons of Canada) competencies in the formulation of learning objectives for our surgical residents and fellows participating in the camps. However, that being said, the service mandate of our partnership must also serve as a foundation for clinical research. At this point, one valid criticism of our three PSCs thus far could rightly be that we do not have any clinical measures of success beyond the very basic. For our pediatric surgical partnership to continue we must ensure that any future PSCs must have more rigorous outcome measures in place. Without those, how can we be assured that the partnership and the PSCs are making any difference?

Lastly, and most importantly, if we truly believe this model of global pediatric surgical partnership is a way forward, then beyond the PSCs, in the longer term, we will together have the greatest impact on access to surgical care for children in Uganda if and only if the partnership extends its educational mandate. The camps have engendered a friendship, an understanding and a trust amongst the Canadians and Ugandans who have been involved, which beyond the children we have helped, is its most significant product. With that friendship and concern we can now move forward to establish much stronger educational and training ties. This may take different forms; longer educational visits to Uganda for Canadian surgical, anesthetic and nursing faculty, curriculum development, robust and regular internet connectivity, studentships, residency projects, etc. Our current lofty goal is to establish a regular pediatric surgical traineeship in Canada for aspiring Ugandan surgeons to help them become pediatric surgeons to serve the needs of the many children of their country.

Our pillars of service, education and collaboration have supported us well through the evolution of our camps and should continue, we believe, to support us on the way forward in our global pediatric surgical partnership.

## References

- [1] Ozgediz D, Poenaru D. The burden of pediatric surgical conditions in low and middle income countries: a call to action. *J Pediatr Surg* 2012;47:2305–11.
- [2] Kinnear J, Bould M, Ismailova F, et al. A new partnership for anesthesia training in Zambia: reflections on the first year. *Can J Anesth* 2013;60:484–91.
- [3] Farmer PE, Kim JY. Surgery and global health: a view from beyond the OR. *World J Surg* 2008;32:533–6.
- [4] Azzie G, Bickler S, Farmer D, et al. Partnerships for developing pediatric surgical care in low-income countries. *J Pediatr Surg* 2008;43:2273–4.
- [5] Haglund M, Kiryabwire J, Parker S, et al. Surgical capacity building in Uganda through twinning, technology, and training camps. *World J Surg* 2011;35:1175–82.
- [6] Suchdev P, Ahrens K, Click E, et al. A model for sustainable short-term international medical trips. *Ambul Pediatr* 2007;7:317–20.
- [7] Wright IG, Walker IA, Yacoub MH. Specialist surgery in the developing world: luxury or necessity? *Anaesthesia* 2007;62(Suppl 1):84–9.
- [8] United Nation Development Programme. Human development report. <http://hdrstats.undp.org/images/explanations/UGA.pdf>; 2013. [accessed June, 2013].
- [9] Uganda Bureau of Statistics. 2012 Statistical abstract; June 2012 [Kampala].
- [10] Statistics Canada. Population by sex and age group. <http://canada.gc.ca>. [accessed April 2013].
- [11] Canadian Association of Paediatric Surgeons. Workforce Committee; 2013 [data obtained].
- [12] [www.asou.co.ug](http://www.asou.co.ug). [accessed June 2013].

- [13] Barton A, Williams D, Beveridge M. A survey of Canadian general surgery residents' interest in international surgery. *Can J Surg* 2008;51:125–9.
- [14] Powell AC, Mueller C, Kingham P, et al. International experience, electives, and volunteerism in surgical training: a survey of resident interest. *J Am Coll Surg* 2007;205:162–8.
- [15] Goecke ME, Kanashiro J, Kyamanywa P, et al. Using CanMEDS to guide international health electives: an enriching experience in Uganda defined for a Canadian surgery resident. *Can J Surg* 2008;51:289–95.
- [16] Matar WY, Trottier DC, Balaa F, et al. Surgical residency training and international volunteerism: a national survey of residents from 2 surgical specialties. *Can J Surg* 2012;55:S191–9.
- [17] Poenaru D, Borgstein E, Numanoglu A, et al. Caring for children with colorectal disease in the context of limited resources. *Semin Pediatr Surg* 2010;19:118–27.
- [18] Caudron JM, Ford N, Henkens M, et al. Substandard medicines in resource-poor settings: a problem that can no longer be ignored. *Trop Med Int Health* 2008;13:1062–72.