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Partnership in fellowship: Comparative analysis of pediatric surgical training and evaluation of a fellow exchange between Canada and Kenya☆

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ABSTRACT

Background: In pediatric surgery, significant differences in education and practice exist between developed and developing nations. We compared the training of senior fellows in a Canadian and a Kenyan pediatric surgery training program, and evaluated a fellow exchange between the programs.
Methods: The study was performed six years after creation of the exchange program. Areas studied included case volume and distribution, length of training, curriculum, work hours, and an estimate of service to education ratio. Perceived strengths and challenges of the exchange were investigated using questionnaires.
Results: Fellows at each site performed approximately 450 cases/year. Significant differences in case distribution were noted, with plastic surgery, urology and neurosurgery procedures being significantly more frequent in the Kenyan center, and neonatal, minimally invasive, and vascular access procedures being significantly more frequent in the Canadian center. All participants identified educational value in the exchange, although logistical challenges were significant.
Conclusion: Differences exist in the training experiences of pediatric surgical fellows in Canada and Kenya, reflecting the differences in health care environment, education, and surgical practice in the two countries. The exchange program of pediatric surgical fellows tapped into this rich diversity and may be applicable to other medical and surgical specialty training programs.

The practice of pediatric surgery in low- and middle-income countries (LMICs) faces numerous challenges, and is vastly different from its counterpart in high-income countries (HICs) [1–10]. Medical infrastructure is often insufficient to meet basic needs, and largely incapable of handling complex surgical problems. The high cost of medical technology often results in rudimentary, inadequate diagnostic and therapeutic capacities. Access to care is limited by a lack of emergency medical services, cultural practices, and unsafe or unaffordable transport to centralized health care facilities [1,2,6,9]. These factors frequently result in delayed presentation of disease processes, thereby complicating therapeutic interventions and worsening outcomes [3,4]. The lack of human resources to treat children with surgical conditions compounds the inadequacy of timely health care delivery [5]. In East Africa, these issues have resulted in outcomes for surgical diseases far inferior to those for developed nations [6]. While infrastructure, technology and access to care at the local level are greatly dependent upon socio-economic forces, the adequate training of additional workforce is a modifiable variable that can potentially narrow the discrepancy in outcomes between HICs and LMICs [5–7,11–14].

Given the vast differences in surgical practice across the global south–north divide, the experience of pediatric surgical trainees likely differs as well. Exposing trainees from each side of the divide to these differences could result in a mutually enriching experience. Such reciprocity is rare in global surgery [7]. Our study had two objectives. First, we aimed to compare the training of senior fellows in a Canadian and a Kenyan pediatric surgery fellowship program. Second, we wanted to analyze the outcomes of a unique educational program, a formal fellows' exchange between the two sites. The authors are the two pediatric surgeons who created the exchange (SE and DP), two pediatric surgeons (RB and MG) who were among its first participants, and a pediatric surgeon (EH) who currently serves as the program director for the Kenyan site.

☆ Portions of this manuscript were presented as posters at the 2010 annual meeting of the Canadian Association of Pediatric Surgeons, Saskatoon, Sasketchwan, Canada, and the 2012 biennial conference of the Pan African Pediatric Surgical Association, Cape Town, South Africa.

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1. Methods

1.1. Training programs

The two programs studied are the pediatric surgery fellowship program at the Montreal Children's Hospital (MCH) of the McGill University Health Centre, Montreal, Quebec, Canada, and the pediatric surgery fellowship program at Bethany Kids of Kijabe Hospital (BKKH), Kijabe, Kenya. The former is a 2-year program accredited by the Royal College of Physicians and Surgeons of Canada (RCPSC), with reciprocal accreditation by the United States Accreditation Council for Graduate Medical Education (ACGME). It meets all case log requirements of the American Board of Surgery. It is hosted in a university-based free-standing children's hospital. The latter is a 3-year training program accredited by the College of Surgeons of East, Central and Southern Africa (COSECSA), which follows, at a minimum, 2 years of basic surgical training. To date, all African fellows in the BKKH program have completed formal general surgical training programs in their respective countries. The program is hosted in a pediatric surgical unit (BethanyKids) based in a private, not-for profit, faith-based, general referral hospital (AIC Kijabe Hospital).

1.2. Fellow exchange program

The fellow exchange program was initiated at the MCH in 2009 as an organized international rotation incorporated into the training program. The rotation met all the criteria for international rotations required by the American Board of Surgery (http://www.absurgery.org/xfer/abs-rrc_intl_rotation.pdf). It was approved by the Office of Postgraduate Medical Education at McGill University and the College des Medecins du Quebec, allowing the fellow to maintain salary and benefits during the rotation. The first MCH pediatric surgical fellow rotated at BKKH in the Spring of 2010. During the ensuing six months, the international rotation evolved into a pediatric surgical fellow exchange, and the first BKKH fellow rotated at the MCH in the fall of 2010. All of the costs of the exchange, including pre-travel preparations (vaccinations, visas, licenses, etc.), housing, and travel are covered for fellows of both programs. Initially, funding relied on an annual travel scholarship from the Canadian Association of Pediatric Surgeons (CAPS), in addition to academic funds from the MCH Division of Pediatric General and Thoracic Surgery. On several occasions, BKKH fellows were hosted by a family whose child was treated at the MCH. Subsequently, the program was supported by annual donations from the auxiliary of the MCH. Most recently, the program has been endowed through a large private donation to the MCH Division of Pediatric General and Thoracic Surgery.

The objectives of the exchange are shown in Table 1. The overseas rotations are electives that are not mandatory for either fellow. At the time of this writing, five out of seven eligible MCH fellows have taken advantage of the program and five of the six eligible BKKH fellows have done the same. All MCH fellows secured a temporary training license that allowed them to engage in the full range of clinical activities, including call coverage and operating. The first two BKKH fellows were not allowed independent patient contact at the MCH and functioned as observers. The following three were able to secure a temporary training license in Quebec and participate in the full range of clinical activities. The MCH fellows spend four weeks at BKKH while the BKKH fellows spend 6 weeks at the MCH. The BKKH fellows participate in an annual scientific meeting (typically the CAPS meeting) during their rotation, while the MCH fellows participate in a surgical outreach mission during their rotation (typically to a refugee camp), when possible. Each of the MCH fellows has presented his or her experience at a podium slot reserved for traveling fellows at the annual CAPS meeting. Poster presentations on the international rotation and the exchange program, as well as scientific papers from those experiences have also been presented at CAPS and at the Pan African Pediatric Surgical Association (PAPSA) meetings.

Table 1
Objectives of the MCH/BKKH Exchange Program.

To gain exposure and experience in a range of pediatric surgical pathologies rare or absent in the home program.
To gain experience in patient care in a less/more resourced setting, and an understanding of how culture and society influence patient care in that setting.
To gain exposure to didactic, clinical, and operative teaching at an African/North American pediatric surgery training program.
To gain appreciation for the specific challenges confronting pediatric surgeons in the developing/developed world, and the innovativeness and resourcefulness required to meet such challenges.
To gain an understanding of global health issues pertaining to pediatric surgery, and the international opportunities available to pediatric surgeons.
To gain an appreciation for whole person care, including the scientific, social, psychological, and spiritual components of care in a less/more resourced setting.
To gain an appreciation of evidence-based care in pediatric surgery

1.3. Data collection

The complete surgical case logs of the seven pediatric surgery fellows who participated in the program and have since completed their training, 4 from the MCH and 3 from BKKH, were analyzed for volume and case distribution. Surgical procedures were categorized according to appropriate subspecialty. All interventions in patients younger than one month of age were considered neonatal cases, and all uses of laparoscopy and thoracoscopy were considered minimally invasive surgery. Additional variables collected included length of training, sub-specialty rotations, and overall work hours per week. Educational activities were measured and defined as weekly scheduled service or multidisciplinary rounds. An estimate of service-to-education ratio was calculated as (non-operative + non-educational hours): (operative + educational hours). Exposure to index pediatric surgical procedures in both programs were compared to the ACGME Pediatric Surgery Case Log minimums.

An evaluation of the exchange program was administered electronically in April, 2016 to all ten fellows who completed the exchange (https://www.surveymonkey.com/r/W52LQXZ). The evaluation contained four main sections. The first section evaluated the rotation at the partner institution. The second section evaluated potential difficulties encountered in preparation for, or during, the elective. The third section evaluated whether the objectives of the exchange were accomplished. The fourth section asked each participant to list the three most important outcomes of the exchange pertaining to their pediatric surgical training and/or practice.

The study, 15–223 PED, was considered an evaluation of an educational program and therefore exempt from approval by the Research Ethics Board of the McGill University Health Centre.

2. Results

2.1. Characteristics of the training programs

The BKKH trainees had more external rotations during their training period, which was longer by one year, for all but one of the trainees, than that of their MCH counterparts. The MCH trainees had longer average work hours, more dedicated educational activities, and a higher service-to-education ratio as compared to the BKKH trainees. These details are listed in Table 2. The total number of surgical procedures, as well as the number performed per year of training, was tabulated for the 7 fellows who have completed their training. The average number of cases per year was similar between the two fellowships, but significant differences existed in the case distribution of the trainees between sites. The pediatric surgery service at the Kenyan site was quite different from a comparable North American service. It covered a much wider spectrum of pediatric surgery, including urology, plastic surgery and basic neurosurgery (primarily spina bifida and hydrocephalus), as highlighted in Fig. 1. Selected index procedures are shown in Fig. 2, which also displays the ACGME guidelines for minimum case numbers