



## Pediatric surgical capacity building – a pathway to improving access to pediatric surgical care in Haiti



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### ABSTRACT

**Purpose:** Lack of human resources is a major barrier to accessing pediatric surgical care globally. Our aim was to establish a model for pediatric surgical training of general surgery residents in a resource constrained region.

**Materials/methods:** A pediatric surgical program with a pediatric surgical rotation for general surgery residents in a tertiary hospital in Haiti in 2015 was established. We conducted twice daily patient rounds, ran an outpatient clinic, and provided emergent and elective pediatric surgical care, with tasks progressively given to residents until they could run clinic and perform the most common elective and emergent procedures. We conducted baseline and post-intervention knowledge exams and dedicated 1 day a week to teaching and research activities. We measured the following outcomes: number of residents that completed the rotation, mean pre and post intervention test scores, patient volume in clinic and operating room, postoperative outcomes, resident ability to perform most common elective and emergent procedures, and resident participation in research.

**Results:** Nine out of 9 residents completed the rotation; 987 patients were seen in outpatient clinic, and 564 procedures were performed in children <15 years old. There was a 50% increase in volume of pediatric cases and a 100% increase in procedures performed in children <4 years old. Postoperative outcomes were: 0% mortality for elective cases and 18% mortality for emergent cases, 3% complication rate for elective cases and 6% complication rate for emergent cases. Outcomes did not change with increased responsibility given to residents. All senior residents (n = 4) could perform the most common elective and emergent procedures without changes in mortality and complication rates. Increases in mean pre and post intervention test scores were 12% (PGY1), 24% (PGY2), and 10% (PGY3). 75% of senior residents participated in research activities as first or second authors.

**Conclusions:** Establishing a program in pediatric surgery with capacity building of general surgery residents for pediatric surgical care provision is feasible in a resource constrained setting without negative effects on patient outcomes. This model can be applied in other resource constrained settings to increase human resources for global pediatric surgical care provision.

**Level of evidence:** III

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Currently, there is a severe lack of pediatric surgeons to meet global needs [1]. In fact, regions with the youngest populations have the least number of surgeons and anesthesiologists.

Haiti has population of 10 million, 34% of whom are less than 15 years old [2]. The country as a whole has one pediatric surgeon serving its entire population. As a measure to rebuild the health system following the 2010 earthquake, a tertiary hospital with a surgical training program was opened in 2013 in Mirebalais, Haiti (Fig. 1). Given that the lack of human resources is a major barrier to accessing pediatric surgical care in Haiti, and to improve access to pediatric surgical care in Haiti, a pediatric surgical capacity building program was instituted as part of a

general surgical training program. Our aim was to establish a model for pediatric surgical training of surgery residents in Haiti. Our hypothesis was that trained general surgical residents can provide safe pediatric surgical care for the most common elective and emergent pediatric surgical conditions.

There have been no previous studies in the literature describing pediatric surgical capacity building programs in Haiti.

### 1. Materials and methods

#### 1.1. Setting

The program was implemented at a tertiary hospital in rural Haiti with training programs in general surgery, obstetrics and gynecology,

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Fig. 1. Map of Haiti – showing the location of the tertiary hospital in Mirebalais Source: Google Maps 2017: <https://www.google.com/maps/place/Mirebalais>

internal medicine, emergency medicine, and pediatrics. At the start of the pediatric surgical program, the general surgical training program had just received its third class of residents. The general surgical program is a 5 year program in General Surgery. There had been no prior rotations in pediatric surgery. Before the implementation of the pediatric surgical program, children were seen in clinic and in the emergency room together with adult patients. Emergent and elective surgical care was provided by trained adult general surgeons. There were no dedicated pediatric clinic or operating room days. There was no dedicated ward for pediatric surgical patients.

1.2. Study populations

General surgical residents in postgraduate (PG) years 2 and 3 of training. Pediatric patients seen emergently in the emergency room, and pediatric patients seen electively in outpatient clinic.

A baseline knowledge exam was performed to assess the surgical residents' knowledge regarding common pediatric surgical conditions and their management. A baseline assessment of pediatric surgical volume was performed.

1.3. Intervention: capacity building of surgical residents

A pediatric surgical rotation was established. A twice weekly pediatric surgical clinic was started; and 2 operating room days for elective pediatric surgical cases were designated. One operating room day was dedicated to ambulatory cases, and the second operating room day was dedicated to more complex non ambulatory pediatric surgical cases. Emergent cases were performed as they presented from the emergency room. Twice daily teaching rounds were performed in the morning prior to clinic or operating room theater, and in the evening before the on call team took over patient care. One day each week was dedicated to didactic and research activities. As surgical resident knowledge and skills improved, responsibilities were progressively given to them in the wards, clinic, and operating room, usually on their second month on the rotation.

In addition to general surgical residents, team members included a post graduate year 3 resident in pediatrics, a junior pediatric surgeon supported by a senior pediatric surgeon; trained adult general surgeons; anesthesiologists and nurse anesthetists.

The program was run from July 2015 to end of June 2016.

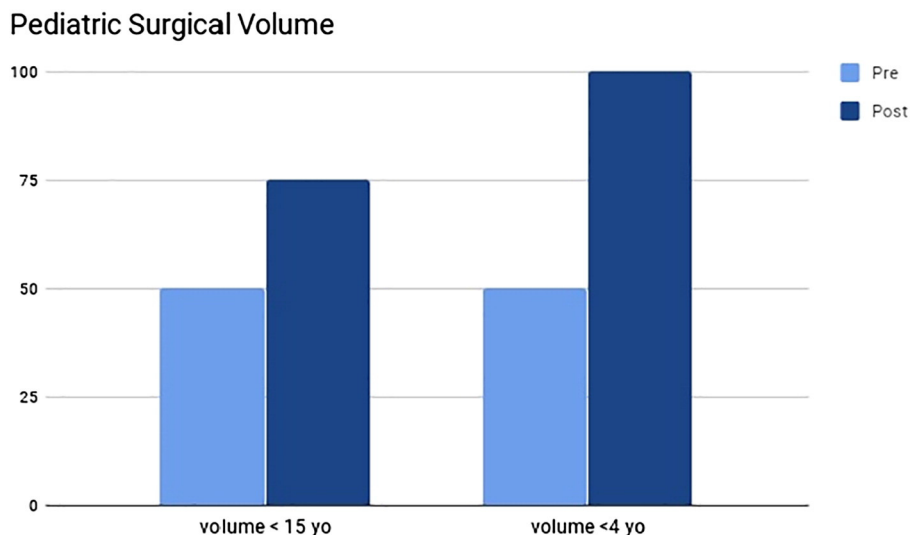


Fig. 2. The most common elective procedure was inguinal hernia repair.

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