

# Pay It forward: Strategies for Successful Implementation of Short-term Endocrine Surgical Mission

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## ABSTRACT

**Introduction:** With increasing interest in humanitarian surgical efforts, numerous opportunities for specialized mission trips have developed. Extreme short-term surgical “blitzes” of specialist teams have offered much-needed surgical care but lack efforts for patient continuity and local sustainability. We sought to define characteristics that aid in the long-term success of short-term international surgical missions to better apply this insight toward future dedicated humanitarian endocrine surgical efforts.

**Materials and methods:** A broad search engine review identified 1,954 reports of medical and surgical missions. One hundred and sixty-six of these abstracts involved surgical missions from 2009 to 2014 with 24 articles including details of specific mission trips. We identified factors deemed essential for improving patient care and affecting local infrastructure for long-term sustainability and included our prospective experience with an endocrine surgery-specific mission trip for comparison.

**Results:** Of the 24 articles reviewed, missions went to Africa (9), North America (8), South America (5), and Asia (5). Factors for mission sustainability and success included the following: (a) ability to educate local physicians and trainees, (b) multiple return trips to the same location, and (c) formal pre-mission planning and site visits. Emerging interest is on optimizing patient outcomes and cost-effectiveness.

**Conclusion:** Short-term surgical missions require a local infrastructure for optimal patient outcomes. Sustainability hinges on education and involvement of local physicians and surgical trainees, pre-mission planning, and return trips to the same location. For endocrine surgical missions, preoperative evaluation and postoperative follow-up by the operating surgeon is important for optimizing performance and outcomes.

**Keywords:** Endocrine, Humanitarian surgery, International, Thyroid.

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## INTRODUCTION

For many years, the majority of global health initiatives have focused on prevention of communicable diseases and promotion of public health education. Surgical treatment of even the most basic pathologies has been largely neglected in public health, especially in low- and middle-income countries with resource-limited settings.<sup>1,2</sup> This landscape is beginning to change, as evidenced by the prominent representation of surgical conditions and basic surgical interventions as the first volume in the newest edition of the World Bank’s Disease Control Priorities.<sup>3</sup>

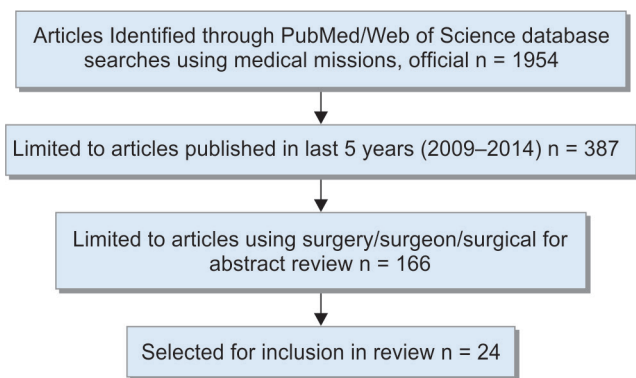
As interest in humanitarian surgical effort surges, numerous opportunities for specialized short-term mission trips have emerged. Extreme short-term surgical “blitzes” of specialist teams have offered much-needed surgical care but lack efforts for patient continuity and local sustainability. Because of this, highly specialized or focused short-term mission trips have often been the subject of criticism.<sup>4</sup> Additionally, many surgical outreach programs require volunteer surgeons to cover a very broad range of conditions, from general surgery to orthopedics to urology.<sup>5</sup> Recognizing that many surgical procedures, including thyroidectomy, are known to have improved outcomes when performed by high-volume specialists, we sought to define characteristics that aid in the long-term success of short-term international surgical missions and better apply this insight toward future dedicated humanitarian endocrine surgical efforts.<sup>6</sup>

## MATERIALS AND METHODS

A broad search engine review of articles from PubMed and Web of Science identified 1,954 reports of medical and surgical missions. To refine the search, articles specifically discussing surgical mission trips were selected; 387 of the initial 1,954 abstracts involved surgical missions and by limiting our search to articles published from 2009 to 2014, we selected a final group of 166 manuscripts. Of these, 24 articles included descriptive details of the specific mission trips (Flow Chart 1).

By analyzing these articles, we identified factors deemed essential for improving patient care and affecting local infrastructure for long-term sustainability. Additionally, we included our prospective experience with an endocrine surgery-specific mission trip for comparison purposes.

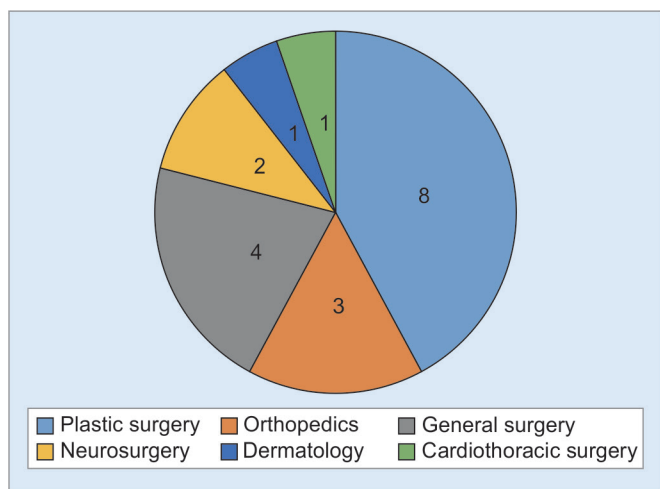
**Flow Chart 1: Study design and search criteria**



**RESULTS**

Of the 24 articles reviewed, mission trips were reported on 4 different continents. The majority went to Africa (9),<sup>7-15</sup> North America (8),<sup>16-23</sup> South America (5),<sup>9,21,24-26</sup> and Asia (5)<sup>9, 27-30</sup>; 67% of these trips included surgical trainees, 42% were plastic surgery-focused, and 37% were general/orthopedic surgery-focused (Graph 1). No manuscript detailed a mission trip specific to endocrine surgery. Trips lasted from 4 days to 3 weeks in length. Fifteen of the trips documented originated from the United States, four originated from the United Kingdom, and the remaining trips originated from Italy, Canada, Switzerland, and New Zealand.

The most commonly cited factors for mission sustainability and success across all articles included the following: (a) ability to educate local physicians and trainees, (b) multiple return trips to the same location, and (c) formal pre-mission planning and site visits. Within the world of global surgery, emerging interest is on optimizing patient outcomes and cost-effectiveness. These three aforementioned factors will undoubtedly help surgical mission trips achieve the lasting impact desired by many international volunteers.



**Graph 1: Most common surgical specialties represented in short-term mission trips**

All authors participated in mission trips. One was a dedicated endocrine mission trip to Tanzania, another part of a long-term established general surgical trip with specific assignment to teaching and performing endocrine surgery. The trip to Tanzania (Dr. Mark Cohen) included 19 subtotal thyroidectomies performed over 5 days for symptomatic goiters. In its entirety, the trip lasted 10 days, which allowed for all potential operative patients to be evaluated for surgical suitability in a preoperative clinic on the first day at the facility. All patients were evaluated and examined by the operating surgeon, including a surgeon-performed neck ultrasound, prior to surgical intervention. Surgeries were performed on days 2 to 6 of the mission trip, and all patients were followed postoperatively until discharge. The last patient was discharged on day 9 of the trip. The staff present for this trip included one endocrine surgeon, one trauma/general surgeon, two operating room nurses, a pediatric intensivist, and an anesthesiologist. The intensivist covered the postanesthesia recovery unit with a team of local nurses while the remainder of the visiting team was in the operating room.

Surgeries were typically performed from 8 am until 6 pm, as there was no backup generator for the lights after dark, a common occurrence in low-resource settings. Average operative time for subtotal thyroidectomies was 92 minutes (± 18 minutes). All patients received a single 18 to 20 gauge peripheral intravenous line (PIV) and general endotracheal anesthesia (GETA) using isoflurane. No nerve monitoring devices were used. No energy device other than standard monopolar electrocautery was used.

Each patient was left with approximately 2 cm remnant of thyroid tissue at the trachea–esophageal groove bilaterally to preserve a euthyroid state postoperatively, given the lack of availability of thyroid hormone replacement. All patients had thyroid-stimulating hormone (TSH) levels checked 3 weeks postoperatively at the local facility lab to ensure adequate follow-up, with evidence of euthyroid levels in all patients.

A board-certified pathologist at the facility confirmed pathology as benign in all specimens. No postoperative complications (bleeding, recurrent laryngeal nerve injury, or hypocalcemia) were observed. No surgical drains were placed in any patient and no cases of postoperative infection were noted.

**DISCUSSION**

As humanitarian surgical missions benefit from increasing popularity and publicity, establishing a sustainable, cost-effective platform that promotes delivery of the highest quality surgical care is paramount.<sup>31</sup> The technically demanding cases treated by endocrine surgeons offer



a prime example of the need for specialist involvement in these endeavors. Many endocrinopathies also require a complex long-term medical management. These treatment plans may differ drastically in settings of low-resource or low-income countries. Awareness of these socioeconomic factors, which is gained by close interaction with local health care providers and sustained relationships with mission fields, allows for optimal patient care. In our particular experiences, no local surgeons were directly involved in the care of the patients undergoing surgical intervention for endocrine disease. We recognize this as a limitation of our experience and acknowledge the importance of working closely with facilities where local surgeons are available. Additionally, one-on-one training between visiting specialists and local surgeons to perform safe thyroid surgery adds a key element of sustainability to humanitarian surgery and should be encouraged whenever possible.

Treatment of pathologies, such as, Graves' disease often includes a total thyroidectomy in developed countries where access to lifelong thyroid hormone replacement poses no challenge. However, this medication may be unavailable or unaffordable for many patients in developing countries, and often results in knowledgeable surgeons offering subtotal thyroidectomy as the treatment of choice.<sup>32</sup> A critical component, therefore, necessary to the ongoing success of endocrine surgery missionary efforts is establishing a local base of care with the ability to triage appropriate patients for surgery as well as a mechanism for patient follow-up after surgery.

As seen in our personal experience, as well as in the literature, many resource-poor countries are endemic goiter zones.<sup>33</sup> Patients with minimal access to health care resources often present in very advanced stages of disease (Fig. 1). These cases are often challenging and are best served by surgeons experienced in the management

of complex thyroid disease. In fact, it has been well documented that outcomes and complication rates for complex thyroid surgeries are improved when performed by surgeons with specialized training in this area and higher volume practices.

As humanitarian surgical efforts continue to expand and offer increasingly sustainable surgical care to the developing world, we strongly advocate forming partnerships with mission hospitals in these locations. Developing a trustworthy relationship with local facilities and health care providers allows for a mutually beneficial experience for patients and providers alike. Consistent short-term visits to the same location foster a sense of trust and security in the care provided, as well as creating a forum for highly specialized experts to train local providers and improve care for patients with complex conditions. Specific to endocrine surgery, the council of the International Association of Endocrine Surgeons has developed Interest (International Endocrine Surgical Teams), which serves as an outreach program to provide support for endocrine surgical teaching, operative supervision, and equipment provision to developing countries.<sup>34</sup> Additional resources, such as telemedicine may facilitate continuous involvement of the visiting surgeons and improve both patient follow-up and outcomes research. As has been the experience of each of the authors, humanitarian surgical mission work is tremendously fulfilling and when done appropriately offers a unique opportunity to pay it forward.

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**Fig. 1:** Advanced thyroid pathology as seen in surgical mission trips to endemic goiter zones (Courtesy: Dr. Nancy Perrier)

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