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## Hand Surgery Outreach—From Short-Term “Missions” to Capacity Building

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### Abstract

Although great advancements have been made in global health over the past decades, progress has not been equivalent across the world. For example, the surgical burden (number of surgical cases per capita) remains highest in low- and middle-income countries (LMICs—a term used by The World Bank to classify countries on the basis of their gross national income), where there are frequently fewer surgeons per capita. Surgical outreach is on the rise, with the United States sponsoring more than 2,000 trips annually to LMICs to help address the mismatch in per capita surgical cases to per capita surgeons. These trips, however, are typically short-term in nature and effect and can have unintended consequences. In contrast, capacity building focuses on bidirectional partnerships to educate and empower individuals and organizations such that their care for the local community is enhanced. Capacity building is a priority of leading organizations (including the World Health Organization) but has often been absent in orthopedic and hand surgery outreach. We detail the evidence supporting the transition from short-term mission-based trips to that of capacity building, what we can learn from other specialties about capacity building, and how we can measure and build capacity to improve health in LMICs using our partnership with Costa Rican hand and upper-extremity surgeons as an example.

### Keywords

Capacity building; global health; hand surgery; patient safety; surgical outreach

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THE GLOBAL BURDEN OF MUSCULOSKELETAL trauma continues to rise, with trauma being the leading cause of mortality in those older than 5 years.<sup>1,2</sup> Worldwide, such injuries account for approximately 1.2 million deaths and 50 million injuries.<sup>1,2</sup> These injuries disproportionately affect those in low- and middle-income countries (LMICs), with more than 95% of all injury-related deaths occurring in LMICs.<sup>3</sup> Hand and upper-extremity trauma accounts for a substantial amount of morbidity, particularly given the downstream effects on quality of life and economic productivity, especially in LMICs, where a young laborer population constitutes the backbone of the workforce.<sup>4-6</sup> Many organizations from high-income countries sponsor surgical mission trips to LMICs to help alleviate this burden on the local workforce.<sup>7</sup> While these trips are well-intentioned and aim to provide surgical care and sometimes education to communities in LMICs, the impact of such trips is often unknown and, in some cases, can be harmful.<sup>8,9,10</sup> For example, if a surgeon from the United States travels to an LMIC and performs a free-vascularized fibula graft, this may take an educational case away from trainees and displace local surgeons. If the patient has a complication, it may also cause long-term issues for the patient, surgical team, and community.

Mission trips are often short (eg, 1 to 3 weeks) and focus on providing direct surgical care to those in need. The success of these trips is frequently measured by quantity-based metrics (eg, number of surgical cases) yet lacks quality measures with long-term post-trip follow-up, pre- and post-trip coordination, and community-centered partnerships.<sup>11</sup> Capacity building, a partnership approach toward developing and strengthening local communities through education and empowerment, is an often-cited goal of leading global health organizations like the World Health Organization (WHO). This approach emphasizes sustainable, mutually beneficial partnerships focusing on access to care and quality.<sup>3,12</sup> We detail the importance of capacity building, a framework to understand and develop capacity, and how to improve hand surgical outreach from a capacity-building perspective.

## **WHY DOES HAND SURGERY NEED TO TRANSITION FROM MISSION TRIPS TO CAPACITY BUILDING?**

Hand surgeons have a unique opportunity to provide life-changing care to those with upper-extremity injuries. Multiple studies have demonstrated the cost-effectiveness and improvement in disability after outreach trips.<sup>13,14</sup> However, the results of these investigations are narrow in scope and impact. The effects of direct care are limited to an individual patient as opposed to the public health of the entire community. As such, there is rising concern about the accountability, safety, and sustainability of short-term mission trips.<sup>8,9,10</sup> For example, Hendriks et al,<sup>9</sup> in evaluating short-term reconstructive missions, demonstrated that the safety and positive impacts of such missions are likely overestimated. The authors found that follow-up rates for surgically treated patients were low and heterogeneous and that when follow-up quality and length were increased, complication rates were considerably higher. Similar results have been demonstrated in a review of the short-term orthopaedic surgery outreach literature.<sup>10</sup> The lay press has also exposed reports of complications and dangers after short-term surgical outreach, citing concerns ranging from a lack of safety standards to volunteers working outside of their scope.<sup>8</sup> In transitioning

from mission trips to capacity building, there are many shortcomings of mission trips that represent opportunities for improvement to ensure accountability, sustainability, and high-quality care. As such, to have the greatest capacity-building impact, the mindset of outreach requires the clinician to change the approach they typically take when practicing medicine, from, ‘how do I treat the patient in front of me?’ to an approach focused on “how do I use my skill set to partner in a way to improve the lives of a community or population?”

## HOW HAVE OTHER SPECIALTIES BEGUN THE TRANSITION FROM MISSIONS TO CAPACITY BUILDING?

Other specialties have begun transitioning from a mission-based approach to capacity building for outreach in various ways. Principles of these approaches include partnership development, collaboration and coordination, professional development through education and research, and infrastructure development. These principles have also been applied to create mechanisms to measure capacity building. For example, HEALTHQUAL International (HQI), a global capacity-building initiative in LMICs, developed the national organizational assessment (NOA) tool to support the development and maturity of improvement work.<sup>15</sup> Although initially designed as an HIV-program-specific tool, the NOA has been adapted and used in over 13 countries to assist with identifying strengths and gaps to target capacity-building needs. In orthopedic trauma surgery, the Consortium of Academic Traumatologists (COACT) was developed to foster collaboration and the alignment of global academic health and orthopedic efforts among trauma surgeons in North America.<sup>3,16</sup> The primary goal of COACT was initially “to develop comprehensive partnerships that promote communication, collaboration, and advocacy through the sharing of best practices, resources, and opportunities in musculoskeletal injury care in LMICs.”<sup>16</sup> This group has begun their work by distributing needs assessment surveys to determine institutional levels of global knowledge exchange (clinical), global research initiatives (research), and global surgical education (education). To address the educational aspect of capacity building, the Institute for Global Orthopaedics and Traumatology (IGOT) has educational programs, including Surgical Management and Reconstructive Training (SMART) courses (didactic courses with a laboratory component on various orthopedic trauma and flap/reconstructive topics) and the IGOT Portal (a free online surgical educational platform). These serve as bidirectional educational exchanges incorporating LMIC partners in the design and iteration of programs.<sup>3</sup> The Asociación de Cirujanos Traumatólogos de las Américas (ACTUAR) network was developed by 60 orthopedic surgeons (representing 20 countries throughout Latin America) to support multisite clinical research and address research capacity building.<sup>17</sup> In doing so, this group conducted a Delphi consensus-building process to identify research priorities that are community-driven.<sup>17</sup> A common theme among these initiatives is the involvement of and engagement with community stakeholders so that partners understand gaps in care and identify research opportunities. Without this, the ability to complete investigations and implement change to improve care is limited.

Outside of orthopedics, the Academic Model Providing Access to Healthcare (AMPATH) is an academic collaboration comprising more than 12 institutions from North America that partner with African institutions to build capacity for cancer treatment.<sup>18</sup> This effort

began with providing drug supplies, training, and treatment guidelines. It has expanded to establish a cancer and chronic care facility and an established oncology department and pharmacy to ensure adequate drug supply. The Sub-Saharan African Network for TB/HIV Research Excellence (SANTHE), an African-led HIV and TB research and capacity-building consortium, has demonstrated success in promoting independence in academia by 1) empowering African-based researchers, 2) offering quality training to junior and early career African scientists and support staff, and 3) offering effective information exchange and collaborations.<sup>19</sup>

## **WHAT ARE THE NECESSARY COMPONENTS OF HAND SURGERY CAPACITY BUILDING?**

While multiple leading organizations advocate for capacity building, little guidance exists on the necessary components of capacity-building efforts. To address this need, the Global Quality in Upper Extremity Surgery and Training (Global-QUEST) investigators<sup>20</sup> used a mixed-methods approach to develop a framework of necessary domains for capacity building.<sup>21</sup> The authors included stakeholders from 9 countries (7 of which include LMICs) to ensure the generalizability of the results from this work. The authors identified 7 domains for capacity building: professional development, financing, part-nerships, governance, community impact, culture, and co-ordination (Fig. 1 and Table 1).

## **HOW DO WE MEASURE THE EFFECT OF CAPACITY BUILDING EFFORTS?**

As organizations continue to recognize the importance of capacity building and begin to develop and implement capacity-building strategies, it is equally essential to develop robust measurement systems to assess the effects of capacity-building efforts. For example, if the American Society for Surgery of the Hand's Touching Hands Program is to implement a strategy for improving the impact of trips on the local community, the effect of such interventions should be measurable and assessed longitudinally.

Global-QUEST is developing objective methods to evaluate tiers for each capacity-building domain that can be assessed longitudinally at a site (Table 1). For example, within the domain of professional development, tiers can range from a trip focused primarily on providing clinical care (least developed) to professional development activities combined with local and national public health priorities (most developed). As organizations seek to develop capacity and analyze the impact of various interventions, these tiers can be visualized to identify areas of opportunity and improvement (Fig. 2 provides a radar chart of simulated data).

## **WHAT ARE THE NEXT STEPS WE CAN TAKE TO TRANSITION HAND SURGERY OUTREACH TOWARD CAPACITY BUILDING?**

The purpose of an organization focused on capacity building might be that one day, their services and expertise are no longer needed. This principle can serve as the "true north" to guide toward prioritizing activities. While the 7 domains of capacity building are all required, our experience is that partnership is the first domain that should lead

the development of the other domains (eg, a strong partnership supports the development of community impact). For example, building partnerships ensures that mutual trust is developed, and stakeholders can openly discuss their interests to minimize unintended consequences and support success. We organized GrUpo de estudio por extremidad Superior Traumatología y Ortopédico (GUSTO), a multi-stakeholder collaboration between United States and Costa Rican hand surgeons focused on partnerships to build hand surgical capacity in Costa Rica to approach capacity building for hand surgery at the country level. GUSTO's first objective was to strengthen partnership through in-person and virtual meetings, and analyze the epidemiology, complications, and barriers/challenges of upper-extremity trauma throughout the country (needs assessment). At these meetings, we discussed local culture, norms, and values with various stakeholders as they strengthened our partnership and developed a mutual understanding of the epidemiology, complications, and barriers/challenges.

Second, we began addressing the professional development domain by working to identify research priorities and the infrastructure needed to pursue training and implementation of clinical research. Spanning multiple capacity-building domains (eg, governance, culture, collaboration), we discussed research ethics and institutional review board processes. Third, we discussed community impact and how we could measure the outcomes of our investigations in ways that are not only feasible but important to and understood by the community. Fourth, we discussed finances for the partnership (eg, local sponsorship for meetings) and for research (eg, using low-cost data collection mechanisms like paper surveys or text-message surveys) that support local independence. This approach, guided by the 7 domains, aims to build capacity. The end goal of our partnership is that Costa Rican hand surgeons are independently involved in conducting community-driven research to improve the care of their community.

Surgical outreach is a growing area of interest that follows the trend in health care globalization. However, these efforts should follow evidence-supported guidance to ensure the greatest impact and least harm. These tools and examples can support the culture change in hand surgery outreach from a mission-driven service focused on treating individual patients to partnerships focused on capacity building and improving the health of communities.

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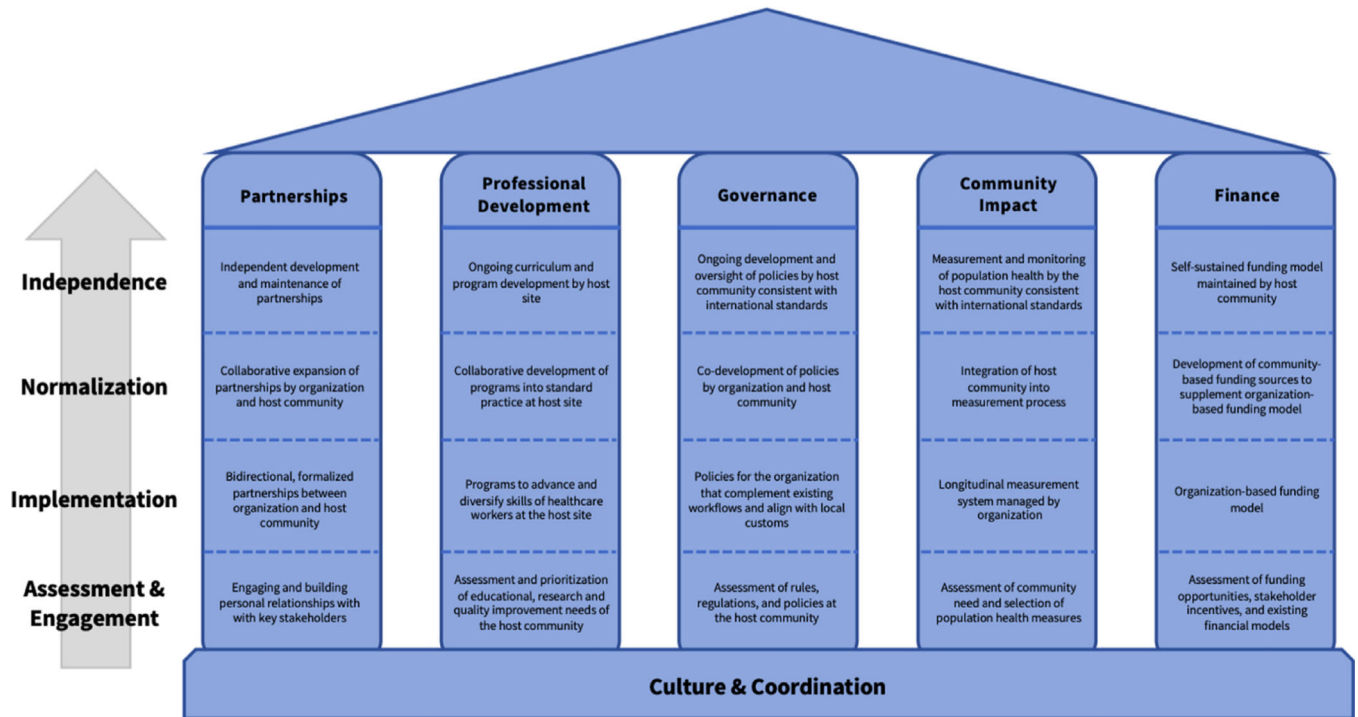
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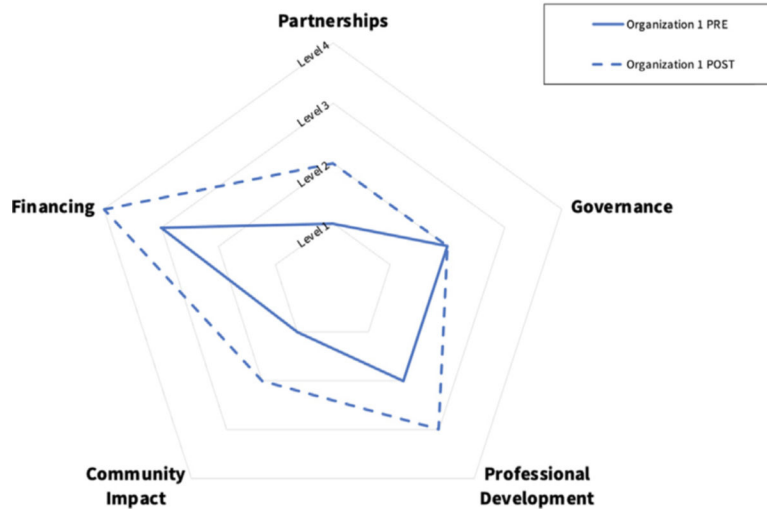




**FIGURE 1:** Organizational framework developed detailing the foundational domains for building surgical capacity in LMICs.



### Impact of Sample Intervention at Sample Hospital



**FIGURE 2:** Radar chart demonstrating capacity building change over time before and after an intervention has been implemented.

TABLE 1.

## Capacity Building Domains Identified with Definitions and Examples

Domain	Definition	Least Developed (example)	Most development (example)	Example
Professional development	The advancement of clinical, research, and quality improvement activities	Trip focus is primarily or solely on the provision of clinical care	Combine professional development with local and national public health work	Quality improvement programs and curricula that allow communities to identify areas of study and improve their systems
Financing	Financial support, resource allocation, coordination of funds, and the recognition of health insurance systems	Budgeting according to volunteer/NGO priorities occurs for costs and expenditures	Independent locally-driven funding allocation for all activities (eg, clinical, quality improvement)	Independent research projects identify areas of need and drive local funding
Partnerships	Long-term connections with local staff, organizations, governments, and others	Local hospitals extend invitations to the outreach organization	The organization works with academic institutions, the public health sector, and local government officials	ReSurge partnerships with multiple sites with recurrent trips over several years to build and maintain trust and ongoing commitment
Governance	The policies and procedures, organizational structures, management supports that guide activity	Basic rules that minimize risks and harm during outreach (eg, not practicing outside of scope)	Engage health ministries and policy-makers on an ongoing basis	Understanding and incorporating policies consistent with community and international standards (eg, preoperative time outs)
Community impact	Alignment with local priorities and accountability/measurement to minimize negative externalities of the community as a whole	Impact of care at the patient or trip level (eg, trip assessment tools in place to measure mortality rates)	Long-term outcome measurement tailored to community identified needs	Reviewing community priorities and preferences in care to incorporate into outcome collection
Culture	Patient and local cultures, norms, and beliefs	Focus on aspects of care delivery (eg, interpreter for language differences)	Develop and implement measurement systems and care pathways based on the local context and needs (eg, education, outcome instruments)	Pretrip preparation in cultural awareness as well as cultural norms, values, others
Coordination	Strategic planning efforts relating to health systems, partnerships, and communication	Coordination occurs between the host hospital/clinic and visiting organization with a focus on individual trips	Collaboration between organizations (eg, ministries of health) with a focus on long-term objectives	Pre- and post-trip feedback with multiple stakeholders