

The Colorado Humanitarian Surgical Skills Workshop: A Cadaver-Based Workshop to Prepare Residents for Surgery in Austere Settings

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OBJECTIVE: Interest in humanitarian surgery is high among surgical and obstetric residents. The Colorado Humanitarian Surgical Skills Workshop is an annual 2-day course exposing senior residents to surgical techniques essential in low- and middle-income countries but not traditionally taught in US residencies. We evaluated the course's ability to foster resident comfort, knowledge, and competence in these skills.

DESIGN: The cohort of course participants was studied prospectively. Participants attended didactic sessions followed by skills sessions using cadavers. Sample areas of focus included general surgery (mesh-free hernia repair), orthopedics (powerless external fixation), and neurosurgery (powerless craniotomy). Before and after the course, participants answered a questionnaire assessing confidence with taught skills; took a knowledge-based test composed of multiple choice and open-ended questions; and participated in a manual skills test of tibial external fixation.

SETTING: The Center for Surgical Innovation, University of Colorado School of Medicine.

PARTICIPANTS: A total of 12 residents (11 general surgical and 1 obstetric) from ten US institutions.

RESULTS: After the course, participants perceived increased confidence in performing all 27 taught procedures and

ability to practice in low- and middle-income countries. In knowledge-based testing, 10 of 12 residents demonstrated improvement on multiple choice questioning and 9 of 12 residents demonstrated improvement on open-ended questioning with structured scoring. In manual skills testing, all external fixator constructs demonstrated objective improvement on structured scoring and subjective improvement on stability assessment.

CONCLUSIONS: For senior residents interested in humanitarian surgery, a combination of skills-focused teaching and manual practice led to self-perceived and objective improvement in relevant surgical knowledge and skills. The Colorado Humanitarian Surgical Skills Workshop represents an effective model for transmitting essential surgical principles and techniques of value in low-resource settings. (J Surg Ed 1:111-111. ©2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: humanitarian surgery, global surgery, austere settings, surgical skills course, surgical education, resident education

ACGME COMPETENCIES: Patient Care, Medical Knowledge, Practice Based Learning and Improvement

INTRODUCTION

Global surgery has become a topic of increasing professional interest among surgical residents. An American College of Surgeons resident survey showed that 85% were interested in practicing internationally during their careers.¹ In response, many US surgical and obstetric residencies have added

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international rotations to their curricula.² However, such experiences have not fully compensated for the continuing trend among US residencies toward specialization and correspondingly less emphasis on broad based training.³

A recent analysis of surgical caseloads in Médecins Sans Frontières (MSF) facilities across 21 countries demonstrated the breadth of surgical problems a humanitarian surgeon may need to address, performing nearly equal proportions of essential general surgery, obstetric and gynecologic surgery, and orthopedic surgery.⁴ In contrast, graduating American general surgery residents receive little to no exposure to obstetric, gynecologic, or orthopedic care, and a significant portion of their general surgical exposure involves advanced procedures impractical in most humanitarian settings. A parallel situation is undoubtedly faced by orthopedists and obstetrician/gynecologists, many of whom likely find themselves similarly siloed by current training paradigms.

Various training courses for aspiring or novice humanitarian surgeons have been developed in recent years to help fill the knowledge gaps in low-resource surgical skills. However, none to our knowledge are specifically focused toward surgical or obstetric residents. We believed that the lack of a resident-focused global surgery course, despite demonstrated high interest, represented an opportunity for improving the quality of surgical education and subsequent care provision in this domain. We describe here the Colorado Humanitarian Surgical Skills Workshop, a 2-day cadaver-based training course focused on effective transmission of highly relevant low-resource surgical skills to globally focused surgical and obstetric residents nearing completion of their training. We evaluated the course's ability to foster resident comfort, knowledge, and competence in these skills by assessing the cohort of participants in the 2016 course.

METHODS

This is a prospective cohort study of all participants in the 2016 Colorado Humanitarian Surgical Skills Workshop,

held June 4 to 5, 2016 at the Center for Surgical Innovation on the Anschutz Medical Campus of the University of Colorado, Denver.

Resident Recruitment

The course was advertised through the Association of Program Directors in Surgery network to coordinators of surgical residency training programs nationwide. Interested residents submitted applications with personal statements attesting to their interest in global surgery and prior experience in low- and middle-income countries (LMICs). From 36 applications, 12 participants were selected through a competitive process. Enrollment was intentionally capped at 12 so as to preserve a high faculty-to-student ratio and a low student-to-cadaver ratio, thereby maximizing the educational value to each participant. Preference was given to residents in their final 2 years of residency training, under the assumption that a solid base of surgical technique would make the learned skills more tangible and durable. Preference was also given to those residents who had previously demonstrated a commitment to the field of global surgery, either through volunteer work or travel. No fees were charged to participants.

Course Structure

The course was modeled on a similar, more extensive 4-day cadaver-based surgical skills workshop offered by the humanitarian medical organization MSF in Düsseldorf, Germany to its volunteer surgeons. The curriculum was modified to a 2-day workshop to suit time constraints of US surgical residents (Table 1). The course was first offered in 2015.

All participants in the Skills Workshop participated for both the days. The volunteer faculty consisted of 22 attending physicians and fellows from the following 9 specialties: general surgery, vascular surgery, plastic surgery, anesthesia, obstetrics and gynecologic surgery, orthopedic

TABLE 1. Workshop Curriculum

	Day 1
Introduction	Need/burden/rationale
Plastic surgery	Flaps: soleus, fasciocutaneous, gastrocnemius
	Skin grafts with manual blades
General surgery	Mesh-free hernia repair
Anesthesia	<i>Didactics only:</i> low cost/technology anesthetic techniques
Obstetrics & gynecology	<i>Didactics only:</i> cesarean sections and hysterectomies
Vascular surgery	<i>Exposures:</i> neck, subclavian, femoral, popliteal
Neurosurgery	Powerless craniotomies
	Day 2
Thoracic	Emergency airways, chest tube, thoracentesis
Hand surgery	Finger/hand fracture fixation, extensor/flexor tendon repair, cross finger flaps, pedicled groin, and abdominal flaps for back of hand coverage
Orthopedics	Splinting & casting
Orthopedics	External fixation of upper extremities, lower extremities, pelvis
Amputations	Upper extremities, lower extremities, pelvis

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