Learning Abroad: Residents' Narratives of Clinical Experiences From a Global Health Elective

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ABSTRACT

Background While resident participation in global health (GH) rotations has grown, little is known about trainee perceptions of the personal value of these international clinical experiences and their importance to the objectives of GH training.

Objective We sought to better understand the clinical scenarios experienced during international rotations that residents perceived as most meaningful and the frequency of these experiences across scenarios and participating residents.

Methods Using the conceptual framework of Schön's reflection on action, we asked University of Minnesota GH track pediatric and internal medicine–pediatric residents to describe 10 clinical scenarios they found interesting or impactful during their 2016–2017 GH elective. We conducted a qualitative analysis of the deidentified resident narratives and mapped themes to the Accreditation Council for Graduate Medical Education (ACGME) competencies.

Results All eligible residents (n = 13) participated, yielding 129 unique clinical scenarios from 7 countries. We identified 5 thematic groups: (1) addressing challenges in making diagnoses in resource-limited settings; (2) dealing with patient outcomes different from those expected in the United States; (3) encountering and managing diseases in a different *clinical* context; (4) encountering and managing diseases in a different *cultural* context; and (5) reflecting on learning and self-growth. Of the 129 unique clinical scenarios, 30% (n = 39) had not been previously experienced by participants. Across the 5 themes, all ACGME core competencies were addressed.

Conclusions Residents identified meaningful scenarios of their GH experiences that are relevant to the educational and clinical objectives of GH training.

Introduction

The interest in and value of global health (GH) rotations are well-established. Many North American residency programs have incorporated GH education into their curricula, accompanied by the emergence of best practice guidelines for GH engagement.[1,2] Trainees consistently report their GH rotations as a positive experience and a rich source of personal and professional development.[3,4] GH experiences have been shown to increase medical knowledge,[3–5] enhance clinical and communication skills,[3] lead to academic scholarship,[6,7] influence attitudes toward underserved populations, including those in trainees' home settings,[3,4] promote humanitarianism,[4] and inform career choices.[3,4,6,8] Studies have recommended increased resource efficiency[9] and more positive attitudes regarding oral rehydration, breastfeeding, and community health after completing a GH elective.[10] Finally, working under supervision in a resource-limited setting provides trainees with opportunities to address all 6 Accreditation Council for Graduate Medical Education (ACGME) competencies.[11]

Previous work has described the academic value and the types of clinical scenarios residents encounter during GH electives.[12] In contrast, little is known about what trainees find personally and professionally meaningful about their GH experiences. Drawing on best practice models for GH pre-departure education,[1,13] we propose that understanding the meaning that underlies encounters may assist GH education stakeholders to better prepare trainees for these experiences and to assess the impact of GH experiences on trainees and the clinical settings that host them.[1]

Informed by the conceptual framework of Schön's reflection on action,[14] the process of reflecting on experiences and encounters after they occur in order to try and develop insights, understanding, and knowledge, we created the resident "Top 10" log, in which trainees were asked to reflect on their GH clinical experiences and describe 10 meaningful clinical scenarios. We conducted a qualitative analysis of residents' guided reflections on these clinical experiences to better understand what aspects of

DOI: http://dx.doi.org/10.4300/JGME-D-18-00701

clinical encounters trainees find most interesting or impactful during their GH experience.

What was known and gap
While participation in global health (GH) rotations has grown, there is little data on residents' perceptions of the personal value of these experiences and their importance to learning and professional development.

What is new
A qualitative analysis of themes in de-identified narratives of clinical scenarios residents found meaningful, with themes mapped to the ACGME competencies.

Limitations
Single institution study and limited sample reduce generalizability.

Bottom line
Residents identified meaningful scenarios that are relevant to the educational and clinical objectives of GH training, including practice in resource-limited settings.

Methods

Context of Study

The competency-based global health track at the University of Minnesota (UMN) has been in existence since 2005, and includes structured pre-departure orientation, on-ground support, post-trip debriefing, and reflection.[7,15] Trainees select 1 of several established partner sites throughout the world. Electives are a minimum of 4 weeks in duration and supervised by both local and university faculty. In 2016, we modified an existing patient disease/scenario log requirement in which residents recorded diagnoses they encountered to create the resident Top 10 patient log. For this log, residents identified 10 clinical scenarios or diseases they found interesting or impactful during their GH elective, and answered 2 guided questions via an electronic survey:

1. Briefly describe an *interesting* or *impactful* clinical scenario or disease you encountered on your GH elective; and
2. Had you encountered this type of disease or scenario prior to your GH elective?

We administered the survey electronically via Google Forms, and collected data from pediatric and internal medicine–pediatric residents participating in the UMN GH track international electives during 2016–2017. The logs did not include personal health information in their narratives to protect patient privacy. Residents were given access to the electronic survey from departure until their post-trip debriefing, allowing them to reflect on their clinical experiences over the course of the elective and edit reflections as they evolved.

The study was approved by the UMN Institutional Review Board.

Analysis

We extracted deidentified free-text data from the online repository and completed a qualitative thematic analysis, using the frameworks of conventional qualitative content analysis[16] and inductive category development.[16]

A trained qualitative researcher (S.M.L.) independently coded responses and recorded emergent themes. A given clinical scenario was eligible for multiple thematic codes. A second experienced qualitative researcher (M.B.P.) used the established themes to independently code the same written transcripts. The 2 researchers met to systematically review each clinical scenario until consensus was reached. Themes were clustered into larger thematic groupings.

For each theme, 2 frequencies were calculated: (1) how common was this theme across all clinical encounters, and (2) what percentage of residents reported this theme at some point during their GH experience. We also calculated the frequency of clinical scenarios (diseases or clinical experiences) residents indicated were "new" for them, as well as the frequency of new diseases or experiences within each thematic cluster.

After noting the frequency of themes related to "limited resources," we conducted a secondary analysis of those themes corresponding to resource limitations to better understand what trainees found meaningful about these clinical experiences. We calculated the frequency of clinical scenarios referencing resource limitations, along with how often resident narratives included themes related to limited resources.

Finally, we categorized each theme by its relationship to 1 or more of the 6 ACGME competencies (patient care, medical knowledge, systems-based practice, practice-based learning, interpersonal and communication skills, and professionalism).[11]

Results

All eligible residents (n = 13) recorded entries in their patient logs, with each resident reporting between 9 and 10 clinical scenarios (median 10), yielding 129 unique clinical scenarios from 7 countries (Bolivia, Cameroon, Laos, Malawi, Palestine, Tanzania, and Uganda). We identified 26 unique thematic codes, clustered into 5 larger thematic groupings: (1) addressing challenges in making diagnoses in a resource-limited settings; (2) dealing with patient outcomes that differ from those expected in their home country; (3) encountering and managing diseases in a different *clinical* context; (4) reflecting

TABLE 1
What Trainees Found Impactful/Meaningful While Abroad: Thematic Clusters and Frequencies of New Experiences Within Clusters

Addressing Challenges in Making Diagnoses in Resource-Limited Settings	No. of New Experiences Referencing Cluster (n = 39)	% of New Experiences Referencing Cluster
▪ Recognizing the importance of the physical examination when having to rely less on diagnostic testing ▪ Describing the challenges of diagnostic ambiguity ▪ Needing to choose a different approach to making a diagnosis or accept an incomplete work-up ▪ Pursuing innovative solutions or patient level advocacy to pursue diagnosis or treatment	38	32%
Dealing With Patient Outcomes Different From Those Expected at Home Institution		
▪ Seeing patients present late findings or with severe presentations of diseases compared to home experience ▪ Experiencing patient death or an undesired outcome ▪ Dealing with diseases that would conceptually be preventable or treatable at home institution ▪ Needing to transfer patients or triage differently because of lack of resources ▪ Relishing in a clinical win when a patient did better than expected	29	24%
Encountering and Managing Diseases in a Different *Clinical* Context		
Seeing new diagnoses including: ▪ Conditions that are rare in the United States, but common in current setting (eg, malaria, Burkitt's lymphoma) ▪ Conditions that are rare everywhere Seeing common diagnoses in new setting, including: ▪ Conditions that are common in United States, but rare in current setting ▪ Conditions that are common everywhere but may be managed differently because of resources (eg, trauma)	27	23%
Reflecting on Learning or Self-Growth		
▪ Descriptions of shared learning by the medical team ▪ Recognition of medical errors or cognitive biases, including opportunities to reflect humility and say "I was wrong" ▪ Finding meaning in the individual patient	4	12%
Encountering and Managing Diseases in a Different *Cultural* Context		
▪ Navigating different cultural or family-specific values surrounding management ▪ Dealing with the ramifications of a different economic or political context surrounding patient management ▪ Experiencing perceived ethical dilemmas	11	9%

on learning or self-growth; and (5) encountering and managing diseases in a different *cultural* context (TABLE 1).

Of the 129 unique clinical scenarios described, 39 (30%) had not been previously experienced by the residents. Residents reported "new" experiences in all 5 thematic clusters, with the greatest number of new experiences reported for the cluster "addressing challenges in making diagnoses in resource-limited settings" (TABLE 1).

The most common themes, addressed by more than 50% of residents, are grouped in TABLE 2, with representative quotes and associated ACGME core competencies.

The results of the secondary analysis of themes related to education and/or practice in limited resource settings are shown in TABLE 3, along with their frequencies and representative quotes.

Discussion

This study uniquely characterizes aspects of international GH experiences trainees find interesting and impactful, and the frequency with which these experiences occurred for the first time in the trainee's career. The findings suggest residents found interest and impact in the differences they experienced in their GH rotations, including managing diseases in different clinical and cultural contexts, making diagnoses in

TABLE 2
Qualitative Analysis of Themes Addressed by > 50% of Residents: Frequencies, Quotes, and ACGME Core Competencies

Theme	No. (%) of Residents Who Referenced Theme in Scenario (n = 13)	No. (%) of Clinical Scenarios Referencing Theme (n = 129)	Examples From Patient Logs	ACGME Core Competencies Addressed
Limited resources necessitating variation in approach to treatment or diagnosis	13 (100)	32 (25)	see TABLE 3	PC, MK, SBP, PBLI, PROF, ICS
Dealing with diagnostic ambiguity	11 (85)	38 (29)	▪ "Our presumptive diagnosis was bacterial pyomyositis . . . although we had no way to make microbiologic confirmation." ▪ "6-year-old female with unknown cause of worsening neurologic status and eventual decerebrate posturing." ▪ "8-year-old male with remote history of malaria, admitted with substantial weakness, dehydration, ecchymotic eyes, anuria, and hypertension. Required dialysis. Never found a clear diagnosis. Became comatose, though later started to be awake and alert. Later died of unknown causes (anemia, infection?)."	PC, MK, SBP, PBLI
Relying on physical examination to make diagnosis clinically	11 (85)	23 (18)	▪ "There was a baby with multiple congenital anomalies including cleft lip and palate, cutis aplasia, microcephaly, hyper-telorism, low set ears, polydactyly, and limb anomalies all consistent with Trisomy 13." ▪ "I found myself struggling to want to make the clinical diagnosis of pneumonia without radiologic proof."	PC, MK
Encountering severe presentation of common diseases	11 (85)	31 (24)	▪ "18 yo male with history of congenital heart disease (presumed TOF) with palliative PA banding at age 4, since lost to follow-up, now with 1 week RUQ tenderness and 2 months of progressive dyspnea on exertion. Exam with marked clubbing, acrocyanosis, sats 8% on room air, tender hepatomegaly, JVD, scleral icterus. Progressing to Eisenmenger's physiology. Echo with large bidirectional VSD. PA gradient 75, RV pressure 95mmHg)."	MK, SBP, PBLI
Seeing diseases which are rare everywhere	9 (69)	27 (21)	▪ "9 yo female with bloody ascites of unknown etiology." ▪ "I made a home visit for a family that was concerned about their child's right arm paralysis . . . I deduced that the patient had a 'serious infection' when younger and most likely developed paralytic poliomyelitis."	MK, SBP, PBLI

TABLE 2
Qualitative Analysis of Themes Addressed by > 50% of Residents: Frequencies, Quotes, and ACGME Core Competencies (continued)

Theme	No. (%) of Residents Who Referenced Theme in Scenario (n = 13)	No. (%) of Clinical Scenarios Referencing Theme (n = 129)	Examples From Patient Logs	ACGME Core Competencies Addressed
Seeing diseases common in elective setting, but rare in United States	9 (69)	24 (19)	▪ "I have never diagnosed [chicken pox] because of the vaccine in the US." ▪ ". . . ultimately determined to have typhoid fever after several days in the hospital."	MK, SBP, PBLI
Dealing with death	9 (69)	19 (15)	▪ "The most significant pause I've had [involves] the young man who I worried had DKA. I never even wrote down his name . . . none of the labs had been done and the overnight resident had coded him without calling us. He died. I was rushed. I should have followed up on the labs more closely . . . I wish I had spent longer thinking about him." ▪ "14-year-old male suffocation . . . [he] was sent on an errand in the evening and did not return. He was found with sand in his ears, nose and mouth . . . This patient has stuck with me on a daily basis."	SBP, PROF, ICS
Addressing differences in economic and political determinants	8 (62)	17 (13)	▪ "Less clinical but just as impactful—meeting several families that have needed to travel abroad for several stages of chemotherapy [treatment], and learning about the psychosocial stresses from living abroad away from the rest of the family and the financial burden of traveling." ▪ "The interesting part of these patients [were] the discussions about when and how to continue, or become more aggressive with treatment, taking into account the individual patient's familial, psychosocial, and economic considerations." ▪ "The most impactful cases were those that involved navigating the geopolitical, psychosocial, and economic issues that were barriers to our patient's ability to access health care."	SBP, PROF, ICS

TABLE 2
Qualitative Analysis of Themes Addressed by > 50% of Residents: Frequencies, Quotes, and ACGME Core Competencies (continued)

Theme	No. (%) of Residents Who Referenced Theme in Scenario (n = 13)	No. (%) of Clinical Scenarios Referencing Theme (n = 129)	Examples From Patient Logs	ACGME Core Competencies Addressed
Relishing in a "clinical win" with a positive outcome	7 (54)	16 (12)	▪ "I was able to see her in the malnutrition clinic a couple of weeks after discharge and found her to be greatly improved." ▪ [The baby] "developed bilious emesis and I helped diagnosis her with an annular pancreas. She had a surgical repair and did incredibly well." ▪ "8-year-old female admitted with altered mental status, vomiting, and seizures after presumed environmental ingestion. She was intubated, lungs were suctioned, and she walked out of the hospital 3 days later." ▪ "13-year-old with Guillain-Barré syndrome . . . There are only 4 ICU beds for the whole hospital . . . so it takes a patient that has a good outcome and some convincing to get a peds patient in. Luckily he was taken, had a tracheostomy placed, and after 2 weeks was decannulated. Every day he would talk about 'basking in the sun' and show us what muscles were getting stronger. Anytime I was having a hard moment, I would chat with him."	PC, SBP

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; PC, patient care; MK, medical knowledge; SBP, systems-based practice; PBLI, practice-based learning and improvement; PROF, professionalism; ICS, interpersonal and communication skills.

settings with different resources, and experiencing patient outcomes different from those that would be expected in their home country. Additionally, 30% of the clinical experiences described were new for trainees and these experiences spanned all 5 thematic clusters, highlighting the role GH experiences can play in providing residents with novel, impactful learning opportunities.

Almost all residents commented on the impact of clinical experiences when limited resources contributed to an incomplete work-up, a perceived negative patient outcome, or a death. These challenges and the inherent stresses of using limited-resources to care for high-acuity, complex patients in an unfamiliar cultural and frequently ethical context have been previously described.[3] Current guidelines for minimum preparation standards emphasize the importance of reviewing onsite resources (clinical, research, etc), seeking to understand local culture, considering new ethical implications, identifying personal motivations, and ensuring a debriefing process upon return.[1] As of 2014, only 66% of US pediatric residency programs offering global child health electives provided even minimal pre-departure training.[2] We postulate that residents may negatively affect GH host communities during times of emotional distress and culture shock, and emotional preparation for the challenges of working in resource-limited settings should be part of the preparation for GH experiences.[17]

Although working in a resource-limited setting can be challenging or frustrating, dealing with these challenges lays the foundation for deeper experiential learning,[3,18] and some of the most salient clinical scenarios involved residents relishing a "clinical win," feeling encouraged by what they perceived as a positive patient outcome, or expressing gratitude for the opportunity to share a vulnerable moment with a patient and/or colleague of different cultural background. Trainees seemed to balance their frustrations with joy, purpose, and meaning. Studies have shown that trainees exhibit more positive attitudes toward

TABLE 3
Secondary Qualitative Analysis of Resident Narratives Mapping to Themes Related to Resource Limitations

Limited Resource (LR) Theme Leading to . . .	No. (%) of Residents Who Referenced This Theme in a Scenario (n = 13)	No. (%) of Clinical Scenarios Within LR Subgroup Referencing Theme (n = 76)	Examples From Patient Log
Different clinical approach or incomplete work-up	13 (100)	32 (42)	▪ Residents often described reliance on physical examination rather than tests (85% of responses from entire data set). ▪ "Given the prevalence of congenital heart disease, it is common to simultaneously treat patient for pneumonia and heart failure if they present with symptoms that are unclear." ▪ "The decision was made by the Bolivian physician to treat . . . without test. I think given limitations and expense to family this does make the most sense."
Negative patient outcome or death	12 (92)	19 (25)	▪ "The 1 unit of blood was all the family could afford [for the child with malaria complications], and the child died shortly thereafter." ▪ "Unfortunately, because were unable to do a washout of his abdomen, he continued to be severely septic and died the following day." – patient with shunt infection ▪ "There [was] no surfactant [and] limited ventilator support, so the chances for a positive outcome were nearly impossible."
Delay in diagnosis	6 (46)	8 (11)	▪ "17-hydroxy levels [for neonate with ambiguous genitalia] were checked and sent [away] for results . . . gender and sex were pending when I left." ▪ "8-year-old boy diagnosed with osteomyelitis after 3 weeks in the hospital when x-rays finally showed bony changes."
LR leading to innovation or advocacy	5 (38)	11 (14)	▪ "I made a spacer out of a water bottle." ▪ "6-month-old with severe shunt infection . . . we were unable to get an OR time so we did a shunt removal under ketamine sedation . . . Very unique experience." ▪ "[The] visit was extremely motivating for me" and led me to "develop standardized" checklist for clinic. ▪ "[I] thought it was a clever use of the available technology that I hadn't thought of." –using iron in scabies eradication.
Triage or patient transfer	3 (23)	6 (8)	▪ "Given 3 hypoxemic children with evolving disease, unreliable pulse oximetry checks, and only 2 oxygen concentrators, how do you decide which children to give O_2? We chose the 2 with the greater hypoxemia and fortunately all children did well." ▪ "The most impactful cases were those that involved navigating the geopolitical, psychosocial, and economic issues that were barriers to our patient's ability to access health care. These were the cases that involved the need for patients to be referred to outside hospitals for treatment abroad."

underserved populations after completing GH electives.[3,4]

Most residents found meaning in the need for and ability to use their physical examination skills, in keeping with studies showing that following a GH experience, residents believed that physical examination skills were underutilized in diagnosis by US physicians.[19] In light of the growing literature on the decline in physical examination skills,[20] and evidence showing that examination expertise can serve as a pathway to decrease medical errors, clinical experience in an international, supervised, low-resource setting may provide residents with an opportunity to develop this critical skill.[19]

Nearly 40% of trainees discussed how working in a resource-limited setting led to innovation or advocacy. We suspect that this reflects the type of creative problem solving seen with innovations in low- and middle-income countries, which often are low-cost, effective, and typically result from acute medical needs in a low-resource setting.[21] Innovations emerging from international GH experiences may provide for additional opportunities for international research collaboration, research grants,[7,21] and can inform career paths.[6,8] The potential for future clinical and academic benefits to both sending and hosting countries through the bidirectional knowledge and practice exchange that occurs between visiting trainees and their hosts is an important aspect of GH rotations, and warrants further study.

Our study adds to previous work that showed 18% of the diseases encountered during GH electives were new to the residents and 5% were cases of advanced disease stage or progression.[12] Our findings suggest that, in addition to encountering new diseases, residents also encountered novel clinical experiences related to the diagnoses, management, and treatment of conditions in different clinical, cultural, and resource contexts. These experiences provide opportunities to develop in other ACGME competency domains, and the emergent themes mapped to all 6 ACGME competencies, with many addressing more than 1 competency. This supports prior work showing that GH experiences provide an opportunity for residents to address competencies important to their personal and professional development.[11]

Study limitations include its small sample size and participants' self-selection of an elective experience. Trainees were from a single institution, although 7 national partner sites were included.

Conclusion

GH electives provide residents with the opportunity to experience medicine in a different clinical, cultural, and resource contexts, and provide trainees with opportunities to address all 6 ACGME competencies. Residents found these experiences relevant and impactful, including clinical and cultural differences, diagnostic challenges, and dealing with greater mortality and morbidity than experienced in the United States. Residents' reflections on their GH experiences can help inform pre-departure training and support of residents while abroad, and highlight key objectives of GH training.

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Funding: The authors report no external funding source for this study.

Conflict of interest: The authors declare they have no competing interests.

This work was previously presented at the Association of Pediatric Program Directors Annual Meeting, Anaheim, CA, April 5–8, 2017; University of Minnesota PRESS Symposium, Minneapolis, MN, June 14–17, 2017; and Pediatric Academic Societies Meeting, San Francisco, CA, May 6–9, 2017.

The authors would like to thank the participating University of Minnesota trainees.

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Received September 11, 2018; revision received June 19, 2019; accepted June 24, 2019.