



Review

Are we meeting ACGME core competencies? A systematic review of literature on international surgical rotations



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ABSTRACT

Background: In response to the growing interest in global surgery among trainees, international surgical rotation (ISR) was approved as a formal elective of resident curriculum. To define ISR's role, we aim to identify the six core competencies of Accreditation Council for Graduate Medical Education (ACGME) in individual institution's experience.

Data sources: This is a systematic literature review studying general surgery resident experience in ISR as it pertains to the ACGME core competencies. Articles were searched using PubMed, Scopus, and Web of Science. Each abstract and article was reviewed, selected, and tabulated.

Conclusion: Fourteen articles were selected for the review after inclusion and exclusion criteria were applied. We found that ISR provided a valuable educational experience for US surgical residents by meeting the ACGME core competencies in a different environment. ISR is an important addition to the general surgery curriculum. Future direction should focus on bidirectional ISR and educational consortium development.

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Introduction

The burgeoning field of global surgery perfectly integrates into academia; while humanitarianism remains a key component of the field, interest continues to increase among trainees to enter global surgery early on in the academic setting.¹ Training programs, as such, have incorporated international experiences into their educational curriculum. As of 2016, 34% (N = 86) of all general surgery residency programs offer either formal or informal international experience for their trainees.² In response to the growing enthusiasm, in 2011, the American Board of Surgery (ABS) and the

Residency Review Committee (RRC) approved international electives to be counted in fulfilling requirements towards general surgery residency graduation. With the overwhelming interest among residents, the number of programs setting up international surgery rotations (ISR) are only expected to grow.³

Despite its successful introduction into the formal general surgery curriculum, ISR are still a novel concept for many educators in resident training. Often viewed as charity work, doubts are expressed regarding impact on a trainees' academic growth.⁴ In response to these challenges, advocates and participants of ISR have published papers that highlight the benefits of their experiences. However, there is a lack of cumulative data organized with a unifying theme that is relevant to the U.S. resident education experience.

In the U.S., the Accreditation Council for Graduate Medical Education (ACGME) six core competencies provide a framework for

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training and assessment of residents (Table 1). In order to determine how ISR fit into this current guideline of the U.S. training model, we conducted a systematic literature review. We aim to identify how ISR fulfill the ACGME core competencies by examining institution-specific surgical resident experiences.⁵

Methods

A literature search was performed to include articles published up to August 2017. PubMed, Scopus, and Web of Science were explored using combinations and variations of the following terms: international or global, surgery, rotation, medical mission; residents or fellows; education or training or preparedness readiness or culture. Titles and abstracts were initially screened and irrelevant articles were excluded. Studies that provided insight into residency preparedness and international general surgery rotations were selected and these papers were reviewed. Studies involving general surgery were included; however, studies pertaining to fellowship level practice were excluded. Studies focusing on surgical subspecialties such as gynecology or urology were included as long as they were performed by general surgery residents. Both formal ISR and non-ABS approved informal experiences were included in the review. Language was restricted to English. Opinions and editorials were excluded.

After all retained articles were examined, the presenting data were categorized under one of the six ACGME core competencies (Table 1). Following the literature review, thematic analysis was performed within each competency group to organize the data into specific, reportable outcome categories.

Results

Literature review results

Fig. 1 shows the literature review and selection process. Forty-three articles were selected upon initial search. Ten full text articles were selected to be included in the literature review. Four additional full-text articles were included in the review by manual search.

Benefits of an ISR and corresponding competencies (Table 2).

Our search yielded articles published from 2002 to 2017. They included a total of at least 106 residents with an experience in ISR. Countries from the African subcontinent were the most frequent sites of ISR. The Dominican Republic was the second most frequent site of ISR. Experiences described in each article were categorized into a broader theme and appropriate core competencies for each theme were identified.

Medical Knowledge was the most frequently cited benefit of ISR. Its key component was exposure to advanced stage diseases not commonly encountered in the U.S. In addition to novel pathologies, opportunities arose to perform open surgeries and cases outside the realm of general surgery, which are less common in the current era of minimally invasive training. For example, in a paper by

Jarman et al., residents had the opportunity to observe cholecystectomy under regional anesthesia and to perform a thyroidectomy for a goiter.⁶ In the U.S., these are rare educational opportunities.

Patient Care was the next category of cited benefit and included almost uniformly the opportunity to refine physical exam skills and perform high volume of operations.

The third most mentioned area was Systems-Based Practice. Nearly every study reported that residents had increased cost-awareness and the ability to work with limited resources. This was not just a qualitative or perceived benefit but actual changes in the residents' practice. Oliphant et al. showed that residents returning from ISR tended to order less diagnostic tests, without significant changes in patient outcome.⁷

Professionalism, interpersonal communication skills, and problem-based learning and improvement were ranked fourth.

For professionalism, studies most frequently reported the development of a sense of altruism, empathy, and humanism. Furthermore, some residents reported that ISR restored a sense of purpose as a physician that they had lost in the course of demanding training.

In Interpersonal Communication Skills, trainees were able to incorporate various cultural contexts into their communication with colleagues and patients, becoming more culturally aware in their interaction with patients. In addition, residents developed a sense of collegiality with surgeons at hosting institutions through continued mentorship, sponsorship, and communication.

Lastly, for Problem-Based Learning and Improvement, participants used creative ways to incorporate quality improvement into the rotation. For example, there were concerns regarding lack of clinical follow up in the short-term work done; residents from Emory University developed a postoperative education tool for patients using an iPad displaying a wound-care instruction video in order to decrease surgical site infection.⁸

Discussion

To date, no systematic review of the existing literature has been performed, to our knowledge. This study provides a summary of the value of ISR at U.S. institutions based on the ACGME core competencies.

There are many advantages of ISR; we focus on the universal applicability by highlighting the educational benefits in the context of ACGME core competencies. Programs interested in enriching the resident experience by establishing ISR at their institutions will benefit from knowing that the educational standards set by the ACGME are preserved.

Medical knowledge

Proficiency in this discipline is crucial for successfully demonstrating the other five areas of core competency. Medical Knowledge itself is not a difficult discipline to teach in the U.S. Scheduled didactics and continuous clinical work make transfer of knowledge

Table 1
Definition of six ACGME core competencies.

Competencies	Definition
Medical Knowledge	Knowledge of basic science, clinical practice, and public health
Patient Care	Ability to provide compassionate, appropriate, and effective healthcare
Professionalism	Performing professional duties while considering ethics and patient diversity
Systems-Based Practice	Ability to understand the larger context and system of healthcare and utilize it in an effective manner
Interpersonal Communication Skills	Proficiency in information exchange with patients, patient relatives, and medical colleagues
Problem-Based Learning and Improvement	Ability to assess the status of patient care and apply evidence-based medicine to improve current practice

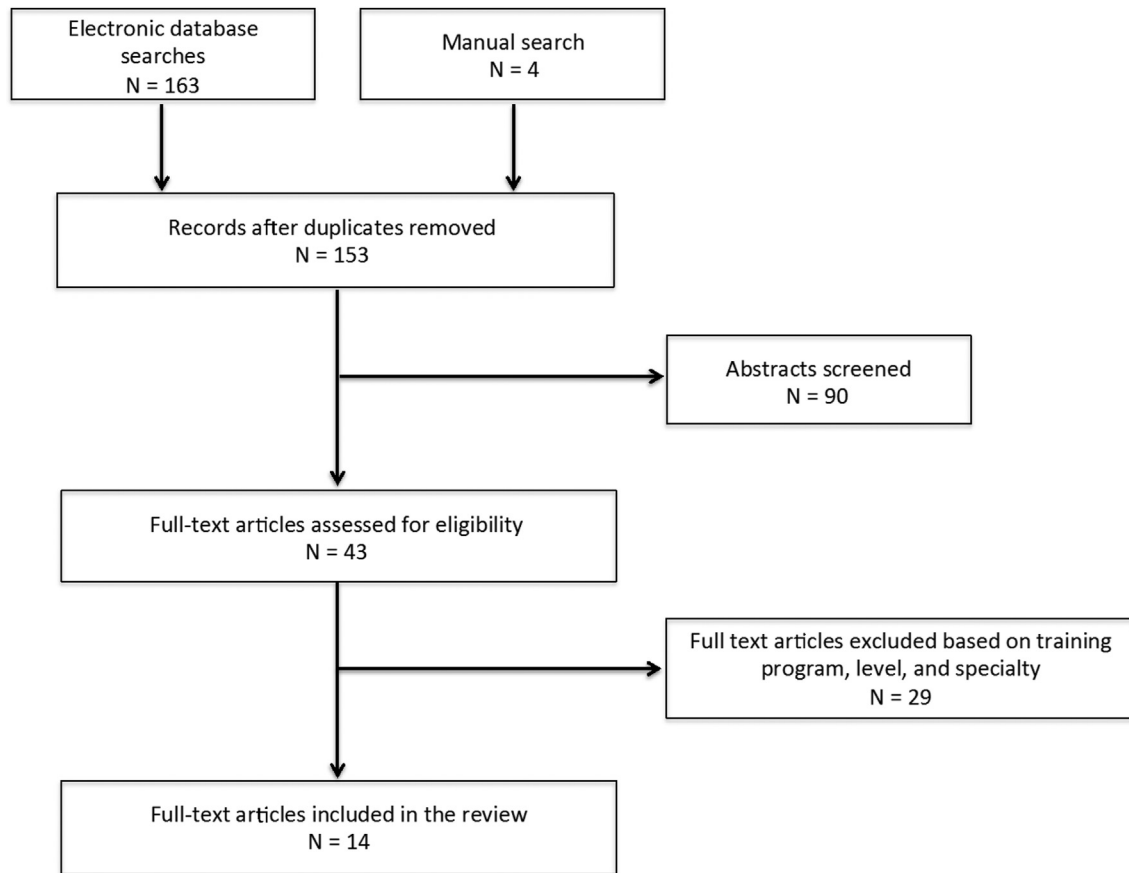


Fig. 1. Flowchart of databases searched, strategy used, and exclusions performed.

feasible. However, residents are not frequently exposed to very advanced pathologies or diseases that are now almost unheard of in high-income countries. Also, the educational curriculum for surgical trainees is geared toward common pathologies and board exam style content. Such a pattern of education can pose a problem when trainees practice in rural settings, generally underserved areas, or practices largely serving recent immigrants. Gaining a broad perspective on pathologies and operative approaches is a crucial part of ISR that provide a strong foundation.

Patient care

In current U.S. based training, residents are exposed to advanced technology and many sub-specialty consultation requests to provide care for patients. Such exposures provide residents with the ability to understand and utilize complex technology and have an expert's input readily available. ISR reveal to trainees the importance of patient interactions in areas with limited resources. We can extrapolate that the clinical autonomy fostered abroad would then promote judicious consultations and increase direct patient interaction.

Systems-based practice

ISR in low resource settings allowed trainees to be creative and respectful of the existing infrastructure and human resources. Systems-Based Practice is a non-traditional core competency and considered conceptually difficult to teach.⁹ This stems from the fact that the healthcare system in the U.S. is highly compartmentalized and resource-abundant, with the overuse of resources in diagnosis

and treatment a well-recognized problem which is not documented well in the existing literature.¹⁰ Results from Oliphant et al.'s study are one example of how experience gained during an ISR fits into Systems-Based Practice in the U.S and allows for a more comprehensive perspective of healthcare.

Interpersonal communication skills

Some residents acquire language skills and some gain experience in working through an interpreter. In the process, they also learn to communicate in a culturally appropriate manner with patients. In addition to providing a broad perspective, ISR settings allow trainees to work alongside with local healthcare providers and communicate with surgeons from different cultural background. These opportunities are important for residents who desire to continue to work in low- and middle-income countries (LMIC) after training. Moreover, in the multicultural society of the U.S., experiences forged in a foreign system can facilitate an insightful relationship with patients at home.

Professionalism

Residents gain trust from patients and colleagues by demonstrating empathy and reliability. However, professionalism cannot be simply taught. Some trainees present with inherent traits of professionalism or a lack thereof, while others may burn out and lose the initial exultation of surgery due to the demands of training.¹¹ During their clinical time in ISR, trainees spent more one-on-one time with their patients allowing them to develop a closer bond. This experience triggers residents to reflect upon their

Table 2
Benefits of international surgery rotation and corresponding competencies.

Reference	Year	Institution	N	Destination	Type	Cited benefits	Associated ACGME core competencies						
							PC	MK	PBLI	ICS	SBP	P	
Harfouche ¹⁸	2017	Temple University	26	NR	Formal rotation	Career development						✓	✓
Donley ¹⁹	2017	Loma Linda University	17	Malawi	Formal rotation	High case volume Case variety/complexity	✓	✓				✓	
Henry ¹⁶	2013	Surgeons OverSeas	14	Multinational	Mixed	Educational Personal Foreign institution/global surgery Home institution	✓	✓	✓	✓	✓	✓	✓
Ozgediz ²⁰	2008	University of California at San Francisco	10	Uganda	Formal rotation	Exposure to new/complex pathology History and physical exam skills Cost awareness/limited resources Reaffirms career in medicine Fosters interest beyond surgery Research opportunities Collaboration opportunities	✓	✓	✓	✓	✓	✓	✓
Klaristenfeld ²¹	2008	Brown University	9	Kenya	Formal rotation	Career development Cost awareness/limited resources History and physical exam skills Decision making skills	✓	✓	✓			✓	✓
Bale ²²	2016	Rutgers University New Jersey Medical School	7	Multinational	Mission trip	High case volume Case variety	✓	✓					
Silverberg ²³	2007	The Mount Sinai Hospital	6	Dominican Republic	Formal rotation	Case variety/complexity History and physical exam skills Transfer of knowledge Cultural competency	✓	✓	✓				
Oliphant ⁷	2012	Michigan State University	6	Multinational	Formal rotation	Cost awareness/limited resources							✓
Cintolo-Gonzalez ²⁴	2016	University of Pennsylvania	6	Botswana	Formal rotation	Exposure to new/complex pathology Cost awareness/limited resources Collaboration opportunities Cultural competency	✓	✓		✓	✓		
Jensen ²⁵	2017	Naval Medical Center	3	Multinational	Formal rotation	Case variety/complexity Career development Developing volunteerism Collaboration opportunities Cultural competency Transfer of knowledge	✓	✓		✓	✓	✓	✓
Jarman ⁶	2009	Gundersen-Lutheran Health System	1	Dominican Republic	Mission trip	High case volume Case variety/complexity	✓	✓					
Kolkman ²⁶	2015	University of Nebraska	1	India	Formal rotation	High case volume Case variety/complexity	✓	✓					
Jacobs ²⁷	2002	NR	NR	Dominican Republic	Mission trip	Exposure to new/complex pathology Cost awareness/limited resources, Patient education Cultural competency	✓	✓		✓	✓	✓	✓
Love ⁸	2015	Emory University	NR	Haiti, Ethiopia	Mixed	Quality improvement, Exposure to new/complex pathology, Transfer of knowledge, Collaboration opportunities, Research opportunities, Patient education, Case variety/complexity	✓	✓	✓	✓	✓	✓	✓
Total			106				11	12	6	6	10	6	

N: Number of general surgery residents participated; ACGME: Accreditation Council for Graduate Medical Education; PC: Patient Care; MK: Medical Knowledge; PBLI: Problem Based Learning and Improvement; ICS: Interpersonal Communication Skills; SBP: Systems Based Practice; P: Professionalism.

role and, furthermore, the ethics and cultural context of their practice. As a result, residents coming back from ISR in LMIC report a sense of altruism, increased cultural awareness, and a restoration of their calling into surgery.

Practice-based learning and improvement

In the U.S., different strategies are used to implement Practice-Based Learning and Improvement, such as the morbidity and mortality conference, journal club, and quality improvement projects.^{12–14} Most ISR are 1–2 months in length, leaving little room for long term, ongoing change. In these instances, residents have developed ways to utilize data collection and focused interventions, as seen in our results. A possible way to develop this competency further would be to establish quality improvement projects with local champions, turning targeted solutions into

sustainable and collaborative ones.

Future directions

Shortly after the ABS and the RRC approved ISR, the majority of residency program directors expressed interest in establishing a relationship with LMIC by inquiring about funding opportunities, the service and educational components, and the logistics of ISR for their residents. Many of these program directors were interested in a collaborative effort to expand options for residents and share educational material.¹⁵ Future direction should be aimed at re-evaluating the feasibility and interest in a national collaboration and the formation of a consortium for ISR. This alliance formation will also help understand how different set-ups in ISR can affect which core competencies are met and maximize trainees' educational experience abroad.

It should be noted that this review is based on the perspectives of U.S. surgical programs. While many American residents have benefited from their experiences abroad, ISR should not be built solely for the benefit of U.S. trainees. The challenge of bi-directionality in global surgery education remains. An exchange program between surgical residencies is considered ideal, but such practice is rare due to visa barriers, liability, credentialing, and a lack of departmental support. If we are sending our trainees abroad to perform procedures not otherwise done at home, while potentially creating competition for cases with local residents without accepting foreign trainees to do the same in the U.S., ISR pose a risk of educational colonialism. Our goal for ISR should be to meet the needs of LMIC that are unique to each site, while continuously developing a mutually beneficial partnership and holding every practice to the same standards we have in the U.S.

Moving forward, training programs should plan to gauge the perspectives of LMIC partnering institutions in order to tailor mutually beneficial ISR experiences. Educational development should be adapted to each partnering institution's area of deficiency and proficiency. For example, if LMIC partners identify Problem-Based Learning and Improvement as their deficiency, U.S. programs can assist in developing quality improvement projects. After introducing the principle concepts of this practice, partnering institutions could expand upon them.

Limitations

There is a selection bias in that most participants of ISR are likely interested in volunteerism and exposure to foreign cultures, predisposing them to view the experiences favorably. There is also reporting bias in the voluntary-based survey studies. Lastly, other than the study by Henry et al., which explicitly compiled a comprehensive list of benefits of ISR, the existing literature is qualitative in nature or focuses on one or two specific competencies.¹⁶ For this reason, core competencies may have been underreported overall, as the objective of the included studies may not have been to discretely evaluate the core competencies themselves.

As previously shown in Lurie et al.'s review, it is not feasible to quantify each of the six core competencies as separate entities due to overlapping qualities.¹⁷ Therefore, a complete quantitative statistical analysis was not feasible in this review.

Conclusion

Overall, the cumulative ISR experience for general surgery residents has been positive and multiple studies demonstrate ISR meets the ACGME core competencies. ISR are a valuable addition, rather than a replacement, to current U.S. surgical resident training and fulfill educational requirements. Future studies should focus on establishing a bidirectional experience as well as forming a consortium for shared resources.

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