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These findings suggest the need for increased and more standardized reporting of racial demographic data.

Use of Learning Curves to Define Graduating Resident Surgical Competency
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INTRODUCTION: Theoretically, a resident’s surgical proficiency increases with operative experience. However, few objective measures are available to assess this. We hypothesized the use of learning curves to establish a proficiency plateau could help programs define graduating residents’ procedure-specific surgical competency.

METHODS: We extracted operative data from three procedures (cholecystectomy, colectomy, and inguinal hernia) performed by three cohorts of graduating residents (N=15) during their senior years (PGY4-PGY5) from 2017 to 2020. We measured resident proficiency by the operative time of each case. CUSUM (cumulative sum control) learning curves were computed for each resident based on operative time. The proficiency plateau was defined as at least four cases consistently locating around the centerline (range 0-1) at the end of a CUSUM chart. We defined procedural competency as the resident establishing a proficiency plateau.

RESULTS: 2446 cases were included (cholecystectomy N=1234, colectomy N=507, and inguinal hernia N=705). Three learning curve patterns emerged: skewed distribution, bimodal distribution, and EKG distribution. Almost half (7/15) of graduating residents reached a proficiency plateau in all three procedures upon graduation; 40% (6/15) reached proficiency plateau in two procedures; 13.3% (2/15) reached proficiency plateau in 1 procedure. Median case volumes associated with the shift (starting point) leading to a proficiency plateau were 73.5 (cholecystectomy), 24.5 (colectomy), and 41 (inguinal hernia).

CONCLUSION: Using a resident’s learning curve based on operative time to determine a proficiency plateau may be a helpful method for measuring procedure-specific competency. Adding more subjects and institutions will help validate this finding.

Vascular Surgery Training Trends in Open Abdominal Aneurysm Repair after the Introduction of Endovascular Abdominal Aneurysm Repair
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INTRODUCTION: The introduction of endovascular abdominal aortic aneurysm repair (EVAR) led to a reduction in open repair (OAR) cases, raising concerns regarding patient safety and future training of vascular surgeons. Our objective is to analyze trends in OAR and EVAR cases and their implications on vascular surgery training.

METHODS: We analyzed the Accreditation Council for Graduate Medical Education (ACGME) case log database for total clinical experience in OAR and EVAR for graduating vascular surgery fellows (VSF) between 2002-2019 and vascular integrated residents (VIR) between 2013-2019.

RESULTS: The average number of OAR cases by VSF decreased by 60% (P<0.001). Meanwhile, average number for EVAR increased by 102%. Two different trends were exhibited with EVAR over the study period. Between 2002-2007, EVAR cases increased by 5.9 cases per year (P<0.001), whereas, between 2008-2019, cases decreased by 0.3 cases per year (P=0.01). For VIR, while no significant trend was observed in the mean number of OAR cases (P=0.2), proportion of OAR was significantly lower compared to EVAR. Like VSF, two different trends were observed with EVAR. Between 2013-2015, EVAR cases increased by 1.7 cases per year (P=0.1), whereas, between 2016-2019, a decrease of 0.2 cases per year (P=0.007) was seen.

CONCLUSION: Number of OAR cases performed by VSF has fallen by 60% with a corresponding doubling in the number of EVAR cases. The proportion of OAR cases performed by VIR mirrors this trend. Advanced fellowships in OAR in high volume centers may be needed to ensure trainees can independently perform such a high-risk procedure.

Virtual Mentoring: A Novel Approach to Facilitate Medical Student Application to General Surgery Residency
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INTRODUCTION: COVID-19 altered the landscape of medical education, disrupting the general surgery residency application process. Decreased access to clinical rotations, limited access to in-person mentors, and lack of in-person interviews, highlighted the need for mentorship programs. We examined the impact of virtual mentoring following the implementation of a novel program for trainees entering the field of general surgery.

METHODS: We designed an exclusively online virtual mentoring program that focused on an individualized, tailored approach in five domains: requesting letters of support, personal statement composition, resume editing, interview skills, and residency program ranking. Immediately following completion of the program, a nineteen-question electronic survey was administered.

RESULTS: 18 out of 19 participants completed the survey. Following the completion of the program participants were more confident in all five domains targeted by the program when responding to survey stems (5-point Likert scale (5-strongly agree)).
Utility of the program, likelihood to recommend, and likelihood to participate again in virtual mentoring were all positive [4-5]. Respondents reported less concern about the impact of COVID-19 on the application cycle. Trainees reported that virtual mentoring is likely to play an increasingly important role in training programs [4-5]. Participants also reported an increased confidence in the match, with a pre-program median of 67 [50 - 65] and post-program median of 84 [75-91] (0.004).

CONCLUSION: Virtual mentoring tailored for medical students entering the match is well received and increases participant confidence. This data should be used as a framework to expand and develop virtual mentoring programs.

Barriers for Medical Students with Underrepresented Identities Considering Orthopaedic Surgery Careers: A Qualitative Investigation

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INTRODUCTION: Orthopaedic surgery remains the least diverse medical specialty, and entrenched gender and racial stereotypes exist about the field. Therefore, we used qualitative methodology to investigate barriers for medical students with underrepresented identities considering orthopedic careers.

METHODS: We selected medical students from four Midwest medical schools using maximum-variation sampling and purposive sampling strategies. Semi-structured interviews were conducted until thematic saturation was reached, which occurred after 19 interviews. Transcripts were analyzed using Grounded Theory methodology, a rigorous inductive qualitative analysis strategy, to create a conceptual model of perceived identity-related barriers for medical students with underrepresented identities.

RESULTS: Participants spanned all four years of medical school, with 16 participants identifying as women and 12 identifying as underrepresented-minority students. Students’ perceived barriers fell into two categories: (1) barriers in the residency application/selection process and (2) fears about a perpetual lack of belonging. Within the application process, students perceived barriers related to implicit bias, and needing to overcome a disproportionate number of hurdles to be viewed as a competitive applicant relative to their peers. Long-term, students feared a perpetual lack of belonging, with specific concerns about scarce mentorship, limited career advancement, tokenism, and the need to sacrifice core aspects of their identity to fit-in. Ultimately, these fears tended to deter medical students with underrepresented identities from pursuing orthopaedics.

CONCLUSION: This qualitative study illustrates several barriers that discourage medical students from pursuing orthopaedic careers. These perceived barriers offer specific opportunities for interventions that can make orthopaedic surgery more attractive to medical students with underrepresented identities.

General Surgery Resident-Initiated Transfers Are Frequent and Mutually Beneficial

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INTRODUCTION: Residents have an increased risk of depression, stress, and substance abuse. Poor mental health leads to decreased clinical efficiency and training satisfaction; it also leads to self-harm and suicide. There is a paucity of data on the mental health of surgical residents in East Africa.

METHODS: This cross-sectional study was conducted between October 2019 and March 2020 in one of the largest teaching hospitals in Kenya. Self-administered questionnaires assessing substance use (ASSIST), educational environment (PHEEM), stress (PSS), and depression (CESD-R) were used. Proportionate random sampling was used to sample residents in general surgery (GS) and ear, nose, throat surgery (ENT).

RESULTS: A total of 47 residents from GS and 28 from ENT were sampled. Majority were male (87.2% GS, and 71.4% ENT). Only 8.5% of GS residents had severe depression. Most (57.4%) had moderate stress, 40.4% rated their educational environment as having ‘plenty of problems’, 10.9% (out of 31 respondents) were at moderate risk of suffering from harmful effects of cocaine. More ENT residents had severe depression (21.4%) and moderate stress (71.4%). 35.7% rated their educational environment as having ‘plenty of problems’, 13.6% (out of 22 respondents) were at moderate risk due to cocaine use.

CONCLUSION: Both specialties had many residents at risk of developing depression (17.0% GS, 39.3% ENT), and moderate stress (57.4% GS, 71.4% ENT). Cocaine use was prevalent (10.9% GS, 13.6% ENT). It is important to improve the mental well being of surgical residents in LMICs. More data is needed from this important but under-studied population.