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Impact of medical school experience on attrition from general surgery residency

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ABSTRACT

Background: Medical school experience informs the decision to pursue graduate surgical education. However, it is possible that inadequate preparation in medical school is responsible for the high rate of attrition seen in general surgery residency.

Materials and methods: We performed a national prospective cohort study of all categorical general surgery interns who entered training in the 2007-2008 academic year. Interns answered questions about their medical school experience and reasons for pursuing general surgery residency. Responses were linked with American Board of Surgery residency completion data. Multivariable logistic regression was used to evaluate the association between medical school experiences and residency attrition.

Results: Seven hundred and ninety-two surgery interns participated, and the overall attrition rate was 19.3%. Most interns had performed ≤8 wk of third year surgery clerkships (53.2% of those who completed *versus* 49.7% of those who dropped out, $P = 0.08$). After multivariable adjustment, shorter duration of third year rotations was protective from attrition (OR: 0.53, 95% CI: 0.29-0.99; $P = 0.05$). There was no difference in attrition based on whether a surgical subinternship was performed (OR: 0.67, 95% CI: 0.38-1.19; $P = 0.18$). Residents who perceived that their medical school surgical faculty were happy with their careers were less likely to experience attrition (OR: 0.57, 95% CI: 0.34-0.96; $P = 0.03$), but those who had gotten along well with attending surgeons had higher odds of attrition (OR: 2.93, 95% CI: 1.34-6.39, $P < 0.01$).

Conclusions: Increased quality, rather than quantity, of clerkships is associated with improved rates of residency completion. Learner relationships with positive yet demanding role models were associated with a reduced risk of attrition.

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Introduction

Attrition is a widespread phenomenon in general surgery training, with approximately 20% of categorical residents failing to complete their training.[1-3] Attrition is costly to both programs and residents and has a tendency to decrease diversity in surgery.[4-7] Several risk factors have been identified, but it remains challenging to identify individuals at risk of attrition before they drop out.[8]

Medical school training familiarizes students with potential areas of practice and prepares them for residency. This training takes place both formally and informally.[9,10] Formally, the general surgery clerkship rotation introduces students to surgical disease processes and provides direct interaction with faculty and residents.[11] Informally, this time also allows students a view into the work and life challenges faced by attending surgeons and residents.[12,13] However, the quality and duration of this interaction is highly variable across medical schools and has changed over the past 20 y, with students often obtaining less exposure to surgical specialties.[14-16]

The variability present in surgical exposure at the undergraduate medical education level provides an opportunity to identify best practices. The formal and informal education that future surgery residents receive as students may shape their resilience and persistence in surgery.[17,18] However, the influence of medical school experience on educational outcomes in residency is not well characterized. We sought to identify aspects of the medical school surgery experience that best prepared incoming general surgery interns for residency training and which therefore might serve to be protective with regard to attrition. We hypothesized that students with a longer and more challenging general surgery experience would be less likely to drop out from residency training.

Methods

We performed a national prospective cohort study of categorical general surgery interns in the class of 2007. As part of the preparation for a later national study, these interns were surveyed in the first month of their internship year with questions related to their previous medical school experience.[19] Surveys were distributed by training programs during orientation or the first few weeks of internship. Participation was voluntary and only categorical general surgery interns were included. Responses were sealed and sent directly to the principal investigator for deidentification. To improve the response rate, programs without any respondents received reminders to distribute the surveys. Resident responses were kept confidential at all times, and the American Board of Surgery (ABS) and training programs did not have access to identifiable data. Completion and return of the survey was considered implied consent. The study was approved by the Weill Cornell Institutional Review Board, protocol #1509016546. The cross-sectional and long-term attrition from this cohort of residents previously has been reported.[6,8]

The primary outcome was noncompletion of general surgery residency training. These data were obtained from the ABS resident files, which contain data on all active surgery residents in the country regardless of program or board eligibility status. Attrition was determined based on each resident's status in December 2016, allowing eight additional years for residents to complete their training. To maintain participant confidentiality and ensure accurate answers, the ABS was not given access to resident survey responses.

The survey was designed based on themes that emerged from in-depth, one-on-one qualitative interviews of residents who had failed to complete general surgery training.[20] For these interviews, purposive sampling of residents who had left training in the past year was performed based on gender, PGY year, program size, and location. Modified grounded theory analysis using the constant comparative method yielded several themes including negative interactions with faculty, and a shortage of good role models. To ensure that an adequate breadth of questions was included, questions also were added based on a literature review of common causes of attrition, and in consultation with the ABS leadership. A total of 31 questions related to resident demographics and their medical school experience were included in this analysis (Supplemental Table 1).

Demographic questions pertained to intern race, ethnicity, marital status, presence of nearby family, and whether they had other family members in medicine. Program characteristics were defined a priori and determined at the start of the study period, regardless of whether a resident may have later switched programs, or whether the size of a program may have changed with time. Large program size was defined as six or more graduating chief residents per year. Program type (academic, community, or military) was determined by the ABS.

Questions regarding the medical school experience were created with respect to how students had been prepared for residency. These questions were in regard to third and fourth year clerkships, subinternship, and the residency match outcome. Questions addressed the quantity and quality of the student's experience in surgery clerkship, their views of faculty and residents, the reasons that motivated their choice of surgery, and their match outcome. More specifically, in regard to clerkship quantity, questions related to number of weeks spent in a surgical clerkship in the third and fourth years of medical school, and whether or not a surgical subinternship was completed. Participants rated their overall medical school surgery experience and also reported their perceptions about the happiness of their medical school faculty and residents, as well as how well they got along with those faculty or residents. They were asked to rate how much each of the following reasons contributed to their decision to choose surgery as a career: their operating room experience, specific interest in surgical diseases, prestige of the profession, and overall medical student experience. Answers were based on a five-point Likert scale of agreement. For analysis, this scale was dichotomized to either agreement or neutral/disagreement.

To identify top-performing students, participants were asked whether they matched at their top choice program or among their top five ranked programs. This metric was chosen because the match was uniformly utilized by everyone who entered residency and is easily quantifiable. However,