Influencing Medical Student Education Via a Voluntary Shadowing Program for Trauma and Acute Care Surgery

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Decreasing application into trauma surgery may be attributed to decreased exposure during medical school. We instituted a voluntary trauma call program for students to provide exposure to the field. After 3 years, participants completed a survey to gauge their experience. Of 126 students who participated, 68 completed the survey (54%). Interest in trauma surgery among students not previously planning on a career in surgery (n = 48) improved after the experience (4.4-5.3 of 10 points; \( P < .005 \)). Operative experience, exposure to a higher number of trauma cases, and time with residents were associated with increased interest in trauma surgery. Witnessing patient death for the first time was associated with decreased interest in trauma surgery. A voluntary overnight shadowing program improves medical students’ perceptions of trauma surgery and increases their reported likelihood to apply into a surgical residency.

Methods

A dedicated group of first-year medical students initiated the creation of a voluntary trauma surgery shadowing program at Johns Hopkins Hospital, an urban, academic tertiary care hospital and state-designated level I trauma center. All medical students were invited to participate in the Friday night program. Sign-ups were coordinated entirely by e-mail and online and maintained exclusively by students. Students were provided with scrubs, a dedicated trauma pager, and call-room accommodations and spent time with the trauma surgery residents, fellows, and in-house surgical attending physicians. Students were invited to observe trauma resuscitations, acute care surgery consult evaluations, surgical procedures, and surgical intensive care unit and/or ward rounds.

Three years after initiation, before any participants had graduated or matched into residency, all participants were contacted by e-mail to fill out an anonymous, web-based survey regarding their experience. Information collected included demographics and experience details. Respondents rated their interest level (Likert scale of 1-10, 1 indicating low level of interest, 5 indicating neutrality, and 10 indicating high interest) in general and trauma surgery before and after the shadowing experience and answered a multiple-choice question about which residency they planned to match into. We also collected qualitative information from multiple open-ended questions. The Johns Hopkins University institutional review board approved this study.

Demographic information was reported as mean (standard deviation). Differences in interest for each specific specialty before and after the experience were compared using paired \( t \) tests. All computations were performed using GraphPad Prism 5 (GraphPad Software).
Results

Of the 126 students who signed up for the shadowing experience, 68 completed the online survey (54%). Students were predominantly second- or third-year students at the time of survey (Table 1). Most shadowed once, but some students returned multiple times (range, 1-4). All openings were filled via the online sign-up process, with a 95% actual attendance rate. Most students (44 of 68; 65%) had not completed any clerkships in the hospital before the program, although approximately one-third (25 of 68; 36.8%) had prior exposure to trauma in an emergency department or in emergency medical services. Students reported a variety of experiences throughout the program that affected their interest in trauma surgery (Table 2). Overall, the qualitative comments about the program were extremely positive (Table 3). By contrast, the most common negative complaint, noted 3 times, was that the night was slow and boring with no trauma.

The mean (SD) interest in trauma surgery among those not initially planning on applying to any surgical field (n = 48) changed significantly (P < .005) from 4.4 (2.4) points (range, 1-9 points) to 5.3 (2.5) points (range, 1-10 points) after participating in the program. The mean (SD) interest in general surgery also increased significantly (P < .05) from 5.5 (2.6) points (range, 1-10) before to 5.9 (2.5) points (range, 1-10) points after the shadowing experience. Three students had a dramatic (>4 points) increase in interest in trauma surgery, all of whom saw at least 3 trauma patients and 1 trauma surgical procedure and reported satisfaction with the number of cases seen and the teaching received. Of the participants, 40% (27 of 68) planned to match into surgery or a surgical subspecialty, and 16% (11 of 68) planned to match to general surgery specifically. These numbers were slightly higher compared with 22% and 8%, respectively, who had matched of the entire graduating class in the previous year.

Discussion

Interest in both surgery in general and trauma specifically significantly improved among medical students after a single overnight shadowing experience. Although most students were only slightly influenced toward a career in trauma surgery, a select few students had dramatic increases in their interest. Notably, these students shadowed on active nights, observed a substantial amount of trauma patient care, and were actively engaged. This paradigm for early exposure may serve as a catalyst to drive interest in surgery for young clinicians in training and could easily be implemented at other academic institutions by engaging the interested student body.

Previous studies on the impact of shadowing on career choice have had variable results. Allen et al15 described an 8-week summer program in cardiothoracic surgery attended by 18 students that included operating room and clinic shadowing. They reported an increased rate of application into cardiothoracic surgery (2 of 18; 11%) or any surgery (14 of 18; 80%) compared with students nationwide. Conversely, Gharabaghian et al14 reported a survey of 41 medical students who shadowed in emergency medicine. Although interest in emergency medicine increased in 24% of students as a result of shadowing, it decreased in 29% and remained neutral in the rest. Compared with these curricula, our program is voluntary, requires less time commitment, and is maintained outside of the school curriculum. Attendance remained remarkably high; even shadowing dates near major holidays and during winter/spring/summer breaks were attended.

There are several limitations of our study. Volunteer response bias could impact our results, especially in this survey-based study, although this is somewhat mitigated by a response rate more than 50%.16 Recall bias may affect some answers since all data were collected retrospectively, particularly for those students shadowing early in the program. Perhaps the students most likely to apply into surgery...
were more likely to shadow, although the effect of this is unclear because a large proportion of the entire student body participated.

Richardson and Miller\textsuperscript{13} noted in 1992 that the personalities modeled by some senior trauma surgeons deterred the recruitment of young surgeons. However, in the new modern era of surgery, Freischlag\textsuperscript{17} suggests that surgeons can be excellent positive role models and have a strong influence on young students and their career choices. We feel that exposure to physicians not so far removed from medical school is critical to change the prevailing negative mindset. Increasing student interest in trauma surgery is possible through voluntary participation in a trauma shadowing experience with engaged residents and dedicated surgical faculty. Although such programs may not substantially alter the career paths of all students, a few highly interested individuals may benefit from learning about this surgical field in the early years of their medical school curriculum.

**REFERENCES**


