

Sustained Increased Entry of Medical Students into Surgical Careers: A Student-Led Approach

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OBJECTIVE: To determine whether a surgical interest group run entirely by preclinical students can influence medical students to enter general surgery residency programs.

DESIGN: Matriculation rates into general surgery and affiliated subspecialties from Columbia University College of Physicians and Surgeons residency match lists were compared to National Residency Match Program data for all U.S. senior students from 2006 to 2014.

SETTING: The Columbia University College of Physicians and Surgeons.

RESULTS: After establishing the interest group, entrance rates into general surgery programs tripled from the early 2000s to more than 12% of 2006 Columbia University College of Physicians and Surgeons graduates. After 8 years, our data illustrate sustained results, with more than 8% of students entering surgical residencies, significantly higher than the National Residency Match Program's average ($p < 0.025$).

CONCLUSIONS: Surgical interest groups spark early and lasting interest in surgery that may influence residency decisions. Moreover, these programs can be successfully run entirely by preclinical students and implemented in other institutions. (J Surg Ed 73:151-156. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgical matriculation, interest group, medical student, medical education

COMPETENCIES: Practice-Based Learning and Improvement, Professionalism, Interpersonal and Communication Skills

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INTRODUCTION

The practice of surgery presents a unique opportunity to combine leadership and decision-making skills with intellectual and technical challenges. From the early 1980s through the 2000s, however, matriculation into general surgery programs steadily waned and the general surgeon workforce was estimated to have decreased by 26%.^{1,2} The percentage of U.S. medical students ranking general surgery programs as their first choice fell from 10.7% in 1984 to less than 5% in 2002.³ Moreover, despite a rising and aging U.S. population with an accompanying increased need for general surgeons, the annual number of certifications granted by the American Board of Surgery has remained static for the past 30 years. It is predicted that by 2028 there would be an additional 18% nationwide shortfall in the general surgery workforce.^{4,5}

Students often have a specialty career goal before entering medical school; however, most preclinical students decide on a specialty track *before* beginning their core clerkship rotations.^{2,6} Although general surgery is one of the most popular specialties among medical students at matriculation,⁷ approximately half of the students who initially express interest in general surgery change their minds during medical school.⁸

Negative lifestyle issues continue to be the most cited factor influencing students' failure to pursue a surgical career.^{9,10} Medical graduates of past generations were passionate about the field and willing to subjugate lifestyle drawbacks during training to achieve the goal of becoming a surgeon. Today, students associate general surgery with high stress, long hours, and sacrifice of personal and family time.^{11,12} Miller et al.¹³ reported that 99% of queried students perceived surgical trainee lifestyle and quality of life as being significantly worse than those of other specialties.

Students, however, are limited in their exposure to surgery and surgeons in the preclinical years. Furthermore, because of increasingly abbreviated surgical clerkships, there

are fewer interactions with attending surgeons.¹⁴ That being said, surgical mentorship and extracurricular clinical experiences have all been found to reinforce students' certainty in their specialty interests.¹⁵⁻¹⁸

At the Columbia University College of Physicians and Surgeons (P&S), matriculation into general surgery steadily waned through the 1980s to 2000s, falling from more than 15% in the class of 1984 to less than 3% in 2002. The Allen O. Whipple Surgical Society was a faculty-driven initiative to increase interest in general surgery at P&S.

MATERIALS AND METHODS

Beginning in 2002, the Department of Surgery organized experiential opportunities for preclinical students to become engaged in and learn about surgical careers. They included accompanying the transplant team on abdominal organ procurements, participating in suture and laparoscopic skills sessions led by surgical staff, evening dinner lecture series with attending surgeons, and various shadowing opportunities.

Subsequently, the current programs targeted at preclinical students to enhance their exposure to surgeons and surgery at P&S are discussed.

Surgical Lecture Series

The lecture series introduces students to surgeons from the once broad field of general surgery and now includes surgeons practicing general surgery, transplant surgery, as well as vascular, thoracic, plastic, and pediatric surgery. Surgeons are invited to speak about how they became interested in their selected fields and are encouraged to discuss the current frontiers in their specialty, the career opportunities in their respective fields, as well as their typical day-to-day activities. The setting is informal and the audience is predominantly preclinical medical students.

The lectures, held every other month, correspond with the preclinical curriculum of the medical students. For example, a thoracic surgeon is invited while the students study pulmonology or a transplant surgeon is invited while students study immunology. The preclinical student lecture coordinator also works with speakers to customize talks to students' interests, whether they be research oriented or more focused on the lifestyle of training and practice in a given specialty. These optional weekday evening lectures have been attended by more than 30% of the preclinical students.

Transplant Procurement Pager Program

The Transplant Procurement program is a unique and exciting opportunity for first-year preclinical students to accompany and scrub in alongside the transplant team. At the beginning of each year, participating students must attend mandatory training sessions on scrubbing, gowning,

and operating room sterility. Students are then "on call" during their assigned period and, if an organ becomes available, the student is paged. Students travel with the team to assist in the procurement and, if permitted, the transplantation on return.

For many medical students, the Transplant Procurement Pager program is their first opportunity to experience the excitement of the operating room. Furthermore, owing to the dramatic nature of the procedures, graduating P&S students often cite this as one of their most positive medical school experiences. At present, 95% of current first-year students participate in this program and it is routinely cited as contributing to student interest in surgery.

Renal Transplant Shadowing

In addition to the transplant procurement program, the living donor renal transplant program offers preclinical students more scheduled opportunities to experience the operating room, develop mentoring relationships with faculty, and foster student-patient interactions.

To develop a greater appreciation for a patient's experience through an operation, students follow up patients needing renal transplantation throughout the day of their transplant. They meet the recipients in the morning, accompany them to the operating room, observe or participate in the procedure, and are encouraged to visit the patient during their recovery. This experience offers students a realistic view of what a day for a transplant surgeon would be like. Approximately 20% of current first-year medical students have participated in this program.

Spend a Day With a Surgeon

Positive surgical role models influence medical students to pursue a career in surgery.^{17,19-21} The Whipple Society keeps a list of surgeons willing to allow preclinical students to shadow them in the clinic or operating room and gain firsthand exposure to a specific field. All of the participating surgeons have expressed interest in mentoring preclinical students, thereby maximizing the teaching experience and fostering student-faculty relationships. Participation data are no longer collected for this program as many students also take the initiative to shadow surgeons from the lecture series or transplant surgeons. Anecdotally, participation was high when tracking was stopped and remains high to this day. It is difficult to accurately evaluate participation as students often follow up on their own and not necessarily through the Whipple Society.

Knot Tying, Suturing, and Basic Laparoscopy Courses

Previous studies have found that hands-on surgical simulations and experience increase entry into surgical

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