



Creating Pathologists From a Post-Sophomore Pathology Fellowship: 21 Years and 126 Fellows at an Academic Pathology Department

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Abstract

Medical student exposure to pathology is a continued concern for departments across the country as traditional pathology content is trimmed from medical school curricula. In a longstanding effort to recruit and expose more medical students to the practice of pathology, our institution has supported a year-long post-sophomore fellowship in pathology since the 1930s. The program employs 6 full-time medical students per year to function as junior residents, taking an active role in delivering surgical pathology and autopsy services, with additional opportunities for teaching, research, and electives. We evaluated residency specialty choices and current practice locations for our department's former post-sophomore fellows (PSFs) who participated in the program from 1995 to 2016. We surveyed them about their reasons for pursuing the post-sophomore fellowship and the program's effect on their clinical practice. From 1995 to 2016, our department employed 126 PSFs, 54 (43%) of whom pursued careers in pathology after completion of the post-sophomore fellowship. This represented 63% of our medical school's graduates who matched into pathology during this time frame (1997-2018; 86 total). Thirteen former PSFs (32.5%) have held academic faculty positions in pathology. PSFs who chose another specialty affirmed the positive influence of the fellowship on their current practice. Our post-sophomore fellowship program is exceptional in the number of students participating each year, and our institution shows a higher percentage of former PSFs pursuing careers in pathology compared to similar studies. The post-sophomore fellowship is an effective tool for recruiting medical students to a career in pathology.

Keywords

medical student, residency, pathology, post-sophomore fellowship, pathology workforce

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Introduction

Medical student exposure to pathology and histology is an ongoing concern for pathology departments across the United States, especially as traditional pathology content is progressively trimmed from medical school curricula. This concern is especially valid in light of recent data from the National Resident Matching Program (NRMP). In the 2017 NRMP match cycle, only 90% of pathology residency positions across the United States were filled. This was the lowest match rate for pathology programs in 4 years and was comparatively lower than the overall 2017 match rate, which averaged 96% of

residency slots filled across all specialties. US medical graduates accounted for only 35.9% of the 2017 post-graduate year (PGY)-1 positions filled in pathology, a proportion that has been steadily declining since the mid-2000s.¹

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To counter these trends, 15% of the anatomic and clinical pathology residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) utilize a post-sophomore fellowship in pathology at their institution as a form of exposure and recruitment (<https://www.apcprods.org/opportunities>). However, very few post-sophomore fellowships have published data on the success of these programs as a recruitment tool for pathology residencies. In a longstanding effort to expose more medical students to the practice of pathology, the University of Iowa Hospitals and Clinics (UIHC) Department of Pathology has supported a year-long post-sophomore fellowship (PSF) since the 1930s. Although the goal of the program does not specifically involve active recruitment to pathology residency, we sought to analyze the effectiveness of our post-sophomore fellowship in attracting medical students to pursue a career in pathology.

Methods

We compiled a list of all former pathology post-sophomore fellows (PSFs) who had participated in the UIHC program between 1995 to 2016. PSFs who were currently in medical school were excluded. We determined the residency program and location (if applicable) for each former PSF using the University of Iowa Roy J. and Lucille A. Carver College of Medicine (CCOM) annual match list database. We also used this database to assess the total number of graduates from CCOM who matched into pathology during that time frame.

We also conducted an e-mail-based survey of former PSFs to generate data about their reasons for pursuing a PSF and the impact of the program on their careers (Supplemental Appendix 1). The survey was distributed to 64 PSFs, based on availability of contact information. Response rate to the survey was 50% (32 responses). All participants received the same survey, regardless of specialty choice. To encourage honest responses, participants had the option to complete the survey anonymously.

Results

Description of University of Iowa Post-Sophomore Fellowship

The UIHC Post-Sophomore Fellowship in Pathology was developed by former department head Dr Harry Pratt (H.P.) Smith, who participated in the United States' first post-sophomore pathology fellowship under Dr George Whipple at the University of Rochester.² The Iowa program has been active continuously since the 1930s, with a brief intermission during World War II (<https://medicine.uiowa.edu/pathology/about-us/departamental-history>. Accessed January 14, 2019).

The UIHC Department of Pathology currently employs 6 full-time post-sophomore fellows (PSF) per year. Two constant requirements for applicants to the program are (1) students must be enrolled at the University of Iowa CCOM and (2) they must be in good academic standing approved by the dean's office. PSFs can choose to participate in the fellowship

between their second and third year or between their third and fourth year of medical school. The PSFs essentially function as PGY-1 residents, and follow a similar rotation schedule as the pathology residents, changing rotations every month. The majority of the rotations occur on anatomic pathology services. PSFs spend approximately 24 weeks on surgical pathology services, where they take an active role in grossing under ACGME indirect and direct supervision guidelines, writing microscopic reports, and signing out cases with staff. They also spend 12 to 16 weeks on the autopsy service (combined forensic and hospital cases), assisting the residents and staff with prosection and occasionally prosecuting their own cases under supervision. The remaining 12 to 16 weeks of the fellowship is allotted toward elective time chosen by the individual, including rotations such as hematopathology, transfusion medicine, molecular pathology, microbiology, cytopathology, or research with a faculty member. Additionally, all PSFs engage in teaching opportunities, leading case-based pathology small groups for health science students within the University of Iowa graduate campus.

PSFs receive an annual stipend of \$25 500, which is entirely funded by the UIHC Department of Pathology. Additional benefits include a \$300 professional allowance for books or study materials and travel support to attend any professional meeting at which an abstract done within the Department of Pathology is presented. PSFs maintain "medical student" status within the University of Iowa CCOM, which allows for continued loan deferment and the ability to acquire student health insurance benefits.

Specialty Choices for Post-Sophomore Fellows

From 1995 to 2016, our department employed 126 PSFs, with an average of 6 PSFs per year. Of this group, 54 (43%) students pursued careers in pathology after completion of the post-sophomore fellowship (Table 1), which includes former PSFs who are currently in pathology residencies. This group represents 63% of all University of Iowa CCOM graduates who subsequently matched into pathology during this time frame (1997-2018; 86 total; Table 2). Former PSFs who chose to pursue a specialty other than pathology most frequently chose surgical specialties (including otolaryngology, ophthalmology, urology, general surgery, and obstetrics-gynecology), followed by internal medicine, pediatrics, or family medicine. Less common specialties for PSFs were emergency medicine, dermatology, psychiatry, radiation oncology, and physical medicine and rehabilitation. Residency data were unavailable for one PSF.

Pathology Residency Locations and Number of Fellowships

Of the PSFs who elected to pursue a career in pathology, 30 (55%) matched at the UIHC Department of Pathology for residency training (Table 1). Given approximately 5 residents per class, this number represents 29% of all residents matched to the UIHC Department of Pathology over those 21 years. Other common locations for residency training included the

Table 1. Medical Student Specialty Choices of PSFs Compared to All College of Medicine Graduates.

Specialty Choices	PSFs, 1995-2016 (n = 126)	Carver College of Medicine Graduates, 1997-2018 (n = 3073)
Pathology	43.0% (54)	2.8% (86)
Surgical specialty (ophthalmology, otolaryngology, urology, general surgery, OB-GYN, neurosurgery)	17.1% (22)	24.1% (740)
Family medicine	10.9% (14)	17.5% (538)
Internal medicine	10.9% (14)	16.0% (491)
Pediatrics	8.7% (11)	12.6 (386)
Emergency medicine	2.3% (3)	6.8% (209)
Dermatology	1.6% (2)	1.7% (53)
Psychiatry	0.8% (1)	3.7% (114)
Physical medicine and rehabilitation	0.8% (1)	0.8% (25)
Radiation oncology	0.8% (1)	0.7% (20)
Unknown	0.8% (1)	0% (0)
Other (anesthesia, neurology, radiology)	0% (0)	13.4% (211)

Table 2. Medical Students Entering Pathology Residency From the Carver College of Medicine (CCOM): Those Participating in the PSF Compared to Those Who Did Not Participate.

Graduating Year	Carver College of Medicine (CCOM) Graduates	% of All CCOM Graduates Choosing Pathology	% of PSF-Graduates Choosing Pathology	% of Non-PSF-Graduates Choosing Pathology
1997-2001	741	1.9% (14)	35.7% (5)	64.3% (9)
2002-2006	701	3.6% (25)	56.0% (14)	44.0% (11)
2007-2011	665	3.9% (26)	76.9% (20)	23.1% (6)
2012-2016	684	1.9% (13)	69.2% (9)	30.8% (4)
2017-2018	282	2.8% (8)	75% (6)	25% (2)

Abbreviation: CCOM, Carver College of Medicine.

University of Virginia (4 PSFs) and the Universities of Utah, Michigan, and Colorado (3 PSFs each). All survey respondents who had completed a pathology residency had also completed at least one fellowship in pathology.

Post-Sophomore Fellows in Academic Faculty Positions

Twenty-seven PSFs (29.7%) have held academic faculty positions across the United States in specialties including, but not limited to, pathology, internal medicine, pediatrics, and surgery (Table 3). Of the PSFs who elected to pursue a career in pathology, 13 (32.5%) have practiced in an academic setting. Thirty-three PSFs were still in residency or fellowship training, and data were unavailable for 2 PSFs. These individuals were not included in this point of analysis.

Table 3. PSFs Holding Academic Faculty Positions Versus Community Practice Positions.

Practice Type	PSFs, All Specialties (n = 91)	PSFs, Now Pathologists (n = 40)
Academic faculty	29.7% (27)	32.5% (13)
Community practice	70.3% (64)	67.5% (27)

Results From Survey of Former Post-Sophomore Fellows

Survey participants were provided with a list of potential reasons that might have influenced their decision to pursue a post-sophomore fellowship. Respondents had the opportunity to check all reasons that applied to them, including “interest in pathology,” “unsure about specialty choice,” “encouraged by pathologist,” “year away from medical school,” “sync with spouse,” and “gain clinical experience” (Figure 1).

“Interest in pathology” was the most frequently selected reason for pursuing a post-sophomore fellowship, followed by “unsure about specialty choice.” Encouragements from a pathology small group facilitator and the opportunity for a year away from traditional medical school were other commonly cited motivations for pursuing the year-long program.

Survey participants also had the option to provide a free-text response about the effect of the post-sophomore fellowship on their current careers. Respondents were universally supportive of their decision to pursue a year in pathology training, regardless of their specialty decision.

Discussion

Post-sophomore fellowships are not a new phenomenon within the pathology educational world. However, as concern for the future of the pathology workforce rises, national pathology societies have shown greater interest in these fellowships and their potential impacts on pathology recruitment. In 2014, the Association of Pathology Chairs and their corresponding Advocacy Committee created a “Pathologist Pipeline” subcommittee to address the issue of a decreasing pathology workforce. Their work included a close examination of the role of post-sophomore fellowships in encouraging medical students to consider a career in pathology and potentially earn advanced credit for a pathology residency. In a survey of all US post-sophomore fellowship directors (approximately 20 nationwide), the Pipeline subcommittee discovered that an estimated average of 47.7% of all former post-sophomore fellows eventually pursued a residency in pathology.³

Our post-sophomore fellowship program demonstrates a similar proportion of former PSFs pursuing careers in pathology, as was reported in the Pathologist Pipeline survey.³ Our program also has a higher proportion of PSFs entering pathology residency than has been reported by any single institution’s program.⁴⁻⁶ Additionally, a majority of our medical

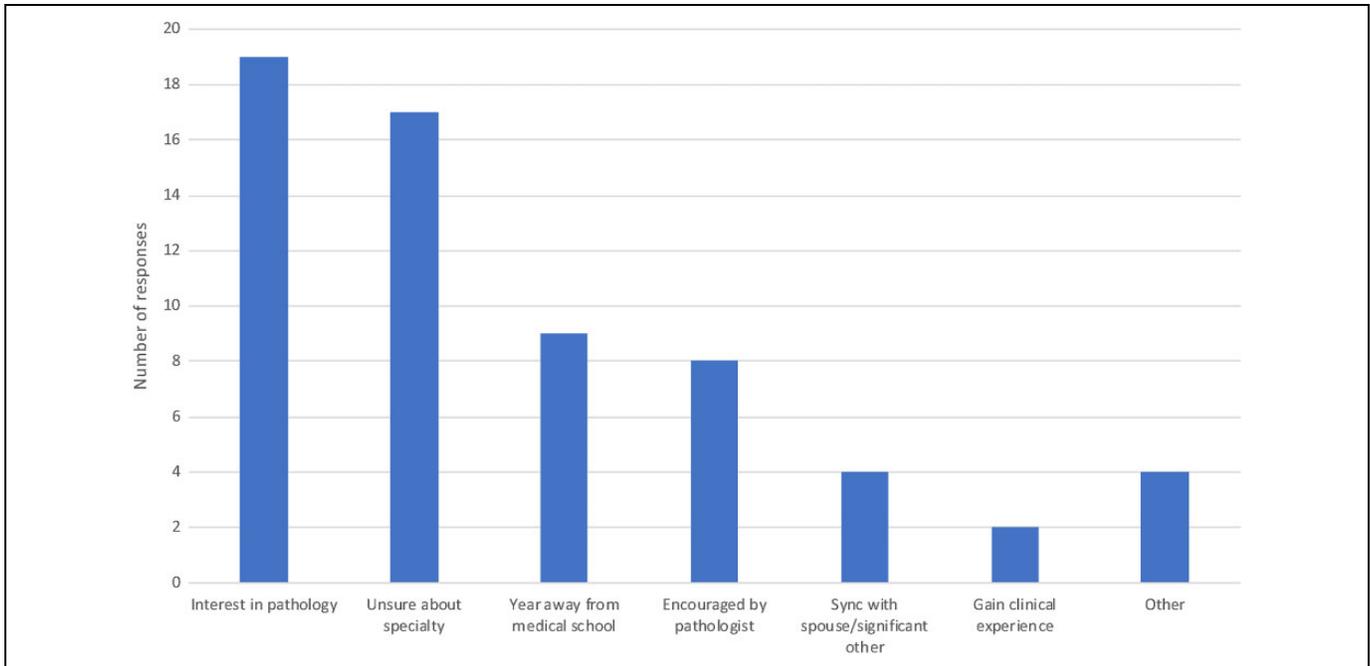


Figure 1. Survey respondents' reasons for pursuing a post-sophomore fellowship.

school graduates who matched into pathology in the past 21 years were former PSFs, notably in the years since 2001. It is therefore reasonable to infer that the post-sophomore pathology fellowship plays an important role in the recruitment of medical students to a career in pathology, both at our institution and at medical schools around the country.

Our survey results suggest that contrary to popular belief, medical students might be amenable to taking a year off from traditional medical school curriculum, especially with the promise of graduated responsibility during the post-sophomore fellowship and accessibility of research opportunities. All of our former PSFs were previously exposed to the specialty of pathology through case-based small groups during their second year of medical school, led by faculty and resident pathologists. Many of these students noted that encouragement from their small-group facilitator played a role in their decision to pursue the year-long program. This insight provides support for the value of pathology within the medical school curriculum, but it also highlights the unique role for pathologists in medical education to encourage motivated students to pursue advanced pathology rotations or a post-sophomore fellowship, if available. A future survey will aim to generate additional data on the elements of the fellowship that were most attractive and ultimately the most valuable for participants, particularly for those who became pathologists.

We conclude that the post-sophomore pathology fellowship is an effective tool for recruiting medical students to a career in pathology, especially for students who are interested in the subject matter or undecided about their specialty choice. We believe this fellowship is a valuable investment for our department, both for the development of future pathologists and as an

opportunity to educate future clinical colleagues about the pathologist's role in the medical system.

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Supplemental Material

Supplemental material for this article is available online.

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