



# Implementation and Evaluation of an Academic Development Rotation for Surgery Residents

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**OBJECTIVE:** To describe the design, implementation, and evaluation of a two-week rotation intended to enhance junior surgical residents' preparation for their dedicated professional development time (PDT) and academic careers.

**DESIGN:** As part of a multifaceted effort to promote residents' academic development, we designed a two-week, nonclinical "Academic Development Block" (ADB) rotation for postgraduate year (PGY)-2 and -3 residents. During this rotation, residents meet with clinical, research, and peer mentors and work on academic activities, with relevant deliverables specific to each class year. We analyzed feedback from postrotation surveys and interviews, which were inductively coded and thematically analyzed, and data on resident grant applications and earnings before and after implementation.

**SETTING:** The general surgery residency program at a major urban, university-affiliated academic medical center. ADBs were first implemented in 2021.

**PARTICIPANTS:** A total of 39 PGY-2 and PGY-3 residents rotated through the program with 51 ADBs over the first two years of implementation.

**RESULTS:** Surveys indicated overwhelmingly positive perceptions on the value of ADBs, including the amount of structure and resources available. Free-response and interview themes indicated appreciation for time to meet with mentors, develop ideas, and complete academic work. Residents believed the ADB rotation accelerated their transition into PDT and was a marker of institutional commitment. Areas for improvement

pertained to the timing of ADBs and pairing of mentors. Both cohorts who participated in at least 1 ADB had higher proportions of residents who successfully applied for grants and a greater amount of total funding awarded compared to all 4 of the most recent cohorts prior to implementation.

**CONCLUSIONS:** A short academic development rotation protected from clinical responsibilities is a well-regarded intervention to help residents refine their career goals and prepare for their PDT. Similar initiatives may be of interest to residency programs seeking to foster their residents' academic career development. (J Surg Ed 81:1748–1755. © 2024 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.)

**KEYWORDS:** General surgery resident, rotation, academic development, professional development, dedicated research time, mentorship

**ABBREVIATIONS:** ADB, Academic Development Block IRB, Institutional Review Board NIH, National Institutes of Health PDT, Professional Development Time PGY Postgraduate year

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

## INTRODUCTION

Over a third of general surgery residents pause their 5 years of clinical training to devote time focusing on

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their professional development.<sup>1</sup> While traditionally called the “lab years” due to a historic emphasis on basic research, residents now pursue a range of research and other academic or clinical pursuits, such as fellowships or advanced degrees. Residents value this time to develop foundational skills for diverse academic surgery career goals. This Professional Development Time (PDT) is important both for the residents individually and for the future of the field of surgery. Despite concerns that the surgeon-scientist is under threat,<sup>2</sup> recent data show that surgeon-scientists are increasing in number and National Institutes of Health (NIH) funding while becoming more diverse in their research efforts beyond basic science.<sup>3</sup> Ongoing efforts are needed to ensure a pipeline of talented academic surgeons who can continue to advance the field and benefit society.<sup>4</sup>

Despite the importance of PDT, residents still face several barriers to achieving their professional development goals. Previous groups have defined the need for institutional efforts to optimize these years for residents and mentors alike.<sup>5</sup> From a resident’s perspective, preparing for these experiences requires identification of a feasible project in light of their overall career aspirations, establishment of a mentorship team, and application for grant funding in advance of dedicated research time.<sup>6</sup> Some institutions have sought to address these areas by implementing structured research curricula either during residents’ protected weekly academic time<sup>6</sup> or longitudinally across residency.<sup>7</sup> However, even if such curricula may enhance residents’ knowledge or confidence, they do little to address the significant investment of time needed to perform tasks such as meeting with potential mentors and writing grant applications. These activities are particularly challenging within the constraints of junior residents’ clinical schedules.

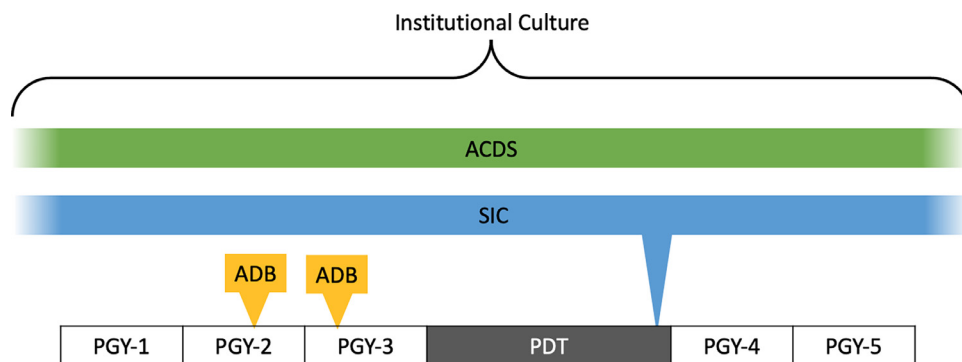
At our institution, we sought to address these issues and to improve residents’ preparation for their PDT by

creating an “Academic Development Block” (ADB) rotation. This is a two-week, nonclinical rotation occurring during both postgraduate years (PGY)-2 and PGY-3, prior to their PDT, with the goal of providing residents time to find and meet with mentors and advisors, pursue opportunities to advance their academic interests, and formulate research plans. We hypothesized that a dedicated program focused on supporting resident-specific needs including identifying mentors, pursuing personalized research opportunities, and obtaining funding would facilitate and enhance residents’ preparedness for their PDT. Here we describe the design, implementation, and evaluation of the program. We hope to spur a broader conversation regarding multimodal approaches to augment the academic development of surgeons in training.

## METHODS

### Conceptualization

In our residency program, located at a major urban, university-affiliated academic medical center in the Northeast USA, approximately 80% of residents have traditionally opted to pursue PDT (most commonly for two years) after PGY-3. Our project began with an informal needs assessment, exploring junior and senior residents’ experiences with: (1) finding mentorship from peers and faculty, (2) academic activities, including applying for grants and presenting at conferences, and (3) plans for their PDT. Our program convened a team to develop a multifaceted Academic Development Program, including formalized mentorship pairings, monthly career development seminars from both faculty and residents, and the ADB rotations (Fig. 1A). The team included the department’s Vice Chair of Research, two “Academic Development Administrative Residents” who were themselves in their PDT, and a dedicated program administrator.



**FIGURE 1A.** Schematic diagram portraying the ADBs in the context of other academic development programs implemented concurrently. The ADBs take place during PGY-2 and PGY-3 years prior to residents starting their PDT. Longitudinal programming available to all residents include Academic Career Development Seminars (ACDS), a monthly series on professional development topics from faculty experts and Surgical Investigators Club (SIC), a monthly series in which PDT residents present their own research.

The Vice Chair of Research and the Administrative Residents meet with each residency class during their first 3 years to discuss the Academic Development Program including formally reviewing expectations for their upcoming ADBs. All categorical general surgery residents, 0+5 integrated vascular surgery residents, and nondesignated preliminary surgical residents are scheduled for two-week ADB rotations during their PGY-2 and PGY-3 years. Resident preferences for the specific timing of the ADBs are accommodated to the extent possible. During the two-week blocks, residents' only clinical responsibility is cross-coverage of one 24-hour weekend shift. Documents pertinent to the ADB and recordings of past seminars are available on a residency-wide institutional Dropbox folder (San Francisco, USA). The departmental administrator supports communication and scheduling meetings, and the Administrative Residents serve as resources and guides for residents during this process.

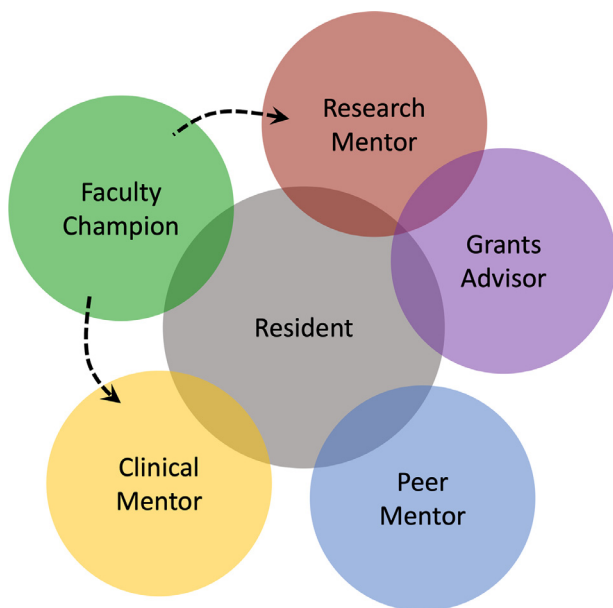
### ADB Components

Prior to the start of their block, residents are assigned a Faculty Champion from a group of faculty members who are well established within the world of academic surgery. The Faculty Champion's specialty and research focus need not align with the resident's specific interests, since the Faculty Champion's role is that of a sponsor<sup>8</sup> serving as an outside perspective and resource if

the resident needs help making connections or finding mentors with similar interests. Additionally, each resident must identify clinical, research, and peer mentors (Fig. 1B). All residents must meet with these 4 mentors, the Department Chair, and a senior research faculty member with whom they will discuss grant applications. Residents are encouraged to meet with as many other peers, mentors, or lab groups as needed.

In addition to the meetings, residents are expected to complete various academic writing activities including drafting their NIH Biosketch, formatting their CV, drafting a career development plan (to be used in grant applications), and eventually working on a "Specific Aims Page" to organize their plans in advance of their PDT (Table 1). The document provided to residents which details the ADB expectations and PGY-specific deliverables is included as Supplemental File 1. Residents are to remain on site and work on their academic development full-time unless their specific plans include compelling reasons to travel to other institutions.

In the final days of the block, residents deliver a short virtual presentation outlining their activities during the ADB and their next steps. The entire Department of Surgery is invited to these presentations, which represent an opportunity for further dialogue and idea generation alongside other residents, researchers, and mentors with whom ADB participants might not have previously interacted. Video recordings are uploaded to the Dropbox



**FIGURE 1B.** Schema of mentorship components to the ADB. All residents are assigned a Faculty Champion, who can assist them in finding their own clinical mentor and research mentor. All junior residents are paired with a senior resident as a peer mentor, and many select additional peer mentors. Residents are also scheduled for meetings with a senior researcher who serves as a grants advisor, as well as with the Department Chair.

**TABLE 1.** Required Elements of the ADBs During PGY-2 and PGY-3

	PGY-2	PGY-3
<b>Start of rotation:</b>		
Meeting with Faculty Champion	X	X
<b>Mentorship meetings:</b>		
Department Chair	X	X
Clinical Mentor(s)	X	X
Research Mentor(s)	X	X
Peer Mentor(s)	X	X
Grants Advisor to identify funding opportunities	X	
<b>Deliverables:</b>		
Draft career development plan	X	
Compile list of relevant grants, conferences, and coursework	X	X
Complete NIH Biosketch	X	X
Update CV		X
Draft Specific Aims Page		X
<b>End of ADB:</b>		
Final presentation	X	X
- What have you done?		
- What did you learn?		
- Vision of success		
- Next steps		
Feedback survey	X	X

for anyone unable to attend. Residents do not receive a formal evaluation after the rotation, but completion of necessary elements is monitored by the administrator and Administrative Residents.

### Program Evaluation

At the end of the ADB, residents were invited to complete an anonymous online feedback survey hosted on RED-Cap.<sup>9</sup> The form explored their perceptions of the ADB, including multiple choice and free-response elements on the perceived benefits, appropriateness of assigned tasks, and value of provided resources, as well as their suggestions for improvement. After the first year, 3 questions were added to the survey based on previous feedback (final version in [Supplemental File 2](#)). Likert-scale results are presented using frequencies. We also conducted semi-structured interviews with 4 ADB participants for a more in-depth evaluation of their experiences beyond what they indicated on the surveys ([Supplemental File 3](#)). Participants were purposively sampled to highlight a variety of experiences and perspectives, including ADB participants who then started their PDT. Interviews were transcribed, de-identified, and analyzed using a qualitative descriptive approach to identify specific strengths of the program and opportunities for improvement. Unique elements were highlighted with representative quotations. Interviews were conducted and analyzed by 2 resident researchers trained in qualitative methods (DC & MK), who took care to ensure their own experiences did not unduly cloud their interpretations.<sup>10,11</sup> Lastly, we compiled data on grant applications submitted through our institution’s Research Management office and presented the data using descriptive statistics. Of note, given the number of other academic development initiatives implemented concurrently in addition to the ADBs, these data are provided to provide context and are not intended to

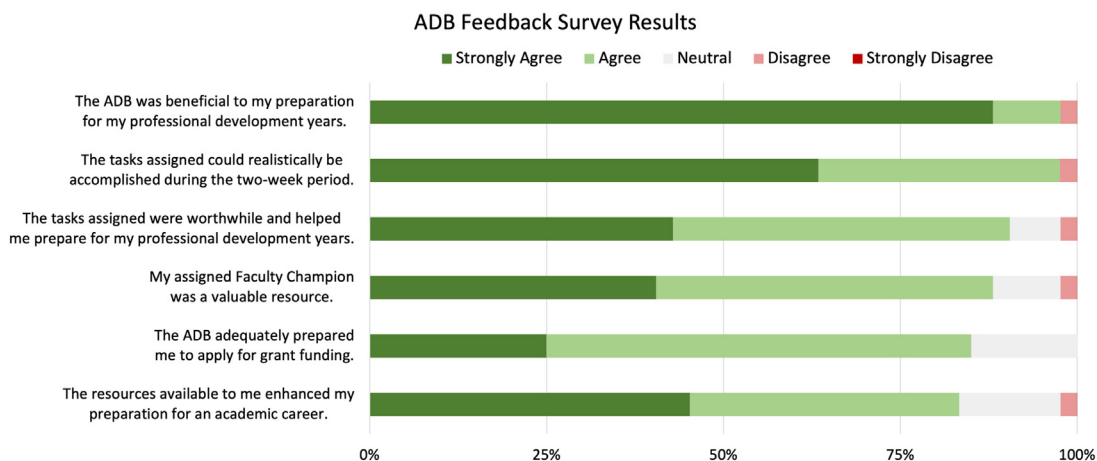
imply any causal link between ADBs and subsequent grant awards. This study was reviewed by the Institutional Review Board (IRB) and deemed exempt.

ADB were first implemented for both PGY-2s and PGY-3s in the 2021-2022 academic year and have continued in the ensuing years. The Academic Development team meets monthly to review the previous month’s ADBs and to discuss the overall trajectory of the program. Across the first 2 years, all categorical, integrated vascular, and preliminary residents in the program participated.

### RESULTS

A total of 39 residents have rotated through the program, with 51 total ADBs over the first 2 years of implementation. There were 42 responses to the feedback survey (82%). Residents’ perceptions of the value of the ADB based on the feedback survey were positive, with over 95% of residents agreeing or strongly agreeing that the ADB was beneficial to their preparation for the PDT ([Fig. 2](#)). When asked about their perception of the amount of structure to the ADB, 93% said just right, with the remaining indicating that there was too much structure. When asked about the amount of resources available to aid their preparation, 93% said just right, with the remaining indicating that there were too little.

When asked for feedback about the program overall, residents’ free response and interview comments were overwhelmingly positive and demonstrated gratitude for this opportunity ([Table 2](#)). In general, PGY-2s used their ADBs to explore different opportunities, while PGY-3s were more focused on pursuing specific projects and grants. Residents appreciated the time to meet with mentors, which may be challenging given the unpredictability of residents’ and surgeons’ schedules. Some



**FIGURE 2.** End-of-rotation survey responses. N=42 for questions 1-5, and N=20 for question 6 (which was added later).

**TABLE 2.** Feedback Themes From ADB Participants

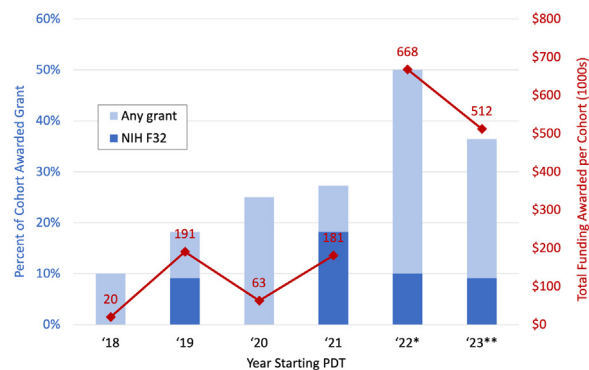
<b>Positive Feedback</b>	<b>Opportunities for Improvement</b>
Opportunity to connect with potential mentors "For my Academic Development Block, I [traveled across the country] to my physical lab, and I met the people that I'd be working with, and I got a sense of what the projects would be and got a chance to meet everyone ahead of time before I actually started." – PDT resident after 1 ADB	Suboptimal timing "What would have been helpful was if my Academic Development time was earlier on. A lot of the fellowships that I applied to had deadlines in like August or September. . . It would be nice to have that block around when that deadline would be." – PDT resident after 1 ADB
"Surgeon schedules are unpredictable. A couple times I had to reschedule the morning of. . . And so there was still time at the end to actually get the meeting in." – PGY-3 resident after 2 ADBs	Limited value of Faculty Champion "If you already have a mentor that's identified, then the Faculty Champion, especially if they're not in your field, they're not particularly helpful because everyone is busy, everyone has a limited scope of what they're able to help residents with." – PDT resident after 1 ADB
Improved ideation and project development "But having the 2 weeks of dedicated time really helped me solidify a plan. Before then, I was sort of doing random projects with different mentors, but PGY-2 [ADB] helped me narrow down on a project." – PDT resident after 2 ADBs "[My PGY2 ADB] is where I started to say, 'Oh, I want to do my own project—an idea of my own that I want to build out and to devise.'" – PGY-3 resident after 2 ADBs	Additional optional guidance for self-reflection "Some structured activities related to better recognition of your leadership styles or your career path, like vision-setting. . . Whether they're readings or reflections or self-assessment tests, things like that." – PGY-3 resident after 2 ADBs
Time to complete academic work "I actually can't imagine applying for grants and getting them during the busyness of PGY3 year. . . without having at least some amount of time off." – PDT resident after 2 ADBs "Because I knew I wasn't taking years off, I considered this time to be pure research time. . . I feel like it's hard to get things started. But once you get the start, it's easier to continue them." – PGY-2 resident who will not pursue PDT	
Advanced planning accelerates PDT transition "During my [PGY2] Academic Development Block I made a timeline of the opportunities that I would plan to apply for. And so then when the first one came up this summer already at the very start of my PGY3, I knew it was coming and I was able to put a what I feel was like a good effort towards a proposal." – PGY-3 resident after 2 ADBs "By the time my research year had started, we already had IRB approval, I had everybody on board, we had systems in place, I had talked to the research coordinators with the cardiac surgery department here, and we were ready to go, up and running. So July 1st is when I started my research time; on July 4th, we enrolled our first patient." – PDT resident after 2 ADBs	
Indicator of institutional support "I've talked about it to our interviewees, as one of the draws to come [to train] here. . . It shows the institutional or departmental support of saying, 'Go write your grants. Here's two weeks to do it.'" – PGY-3 resident after 2 ADBs "It just seems like the attendings are more involved in getting to know the younger residents and what their interests are and helping them figure out what they want to do for the research time." – PDT resident after 1 ADB	

residents interested in working outside of their current city were able to travel to other areas and visit potential labs in person. Another benefit was the mental freedom to think broadly about their goals and develop new ideas. Most participants appreciated the flexible structure of the rotation, which allowed residents at various stages of their academic development to tailor the rotation to meet their own needs. Residents used this time to get started on research projects, submit IRB applications, and/or work on grant proposals. Several commented how it would have taken them months to accomplish all that they did during those 2 weeks, or that without advanced planning because of earlier ADBs they might not even have known about specific grant or research opportunities that they successfully pursued later. There was widespread belief among residents who started their PDT that this early planning allowed them to “hit the ground running.”

Even residents who did not take PDT found ADBs to be highly productive for career discernment, mentorship meetings, and scholarly endeavors. For the few categorical residents who chose to go “straight through” the training program, the activities which occurred during their ADBs, especially as PGY-2s, may have helped them settle on the decision. As PGY-3s, rather than focusing on major grant applications, they still appreciated meeting with mentors and engaging in smaller research projects that they could continue as clinical residents. These observations also apply to nondesignated preliminary residents, who used the opportunity to focus on both short-term (i.e., categorical placement) and long-term career goals. Lastly, the perception was that the establishment of the ADBs served as a clear indicator of departmental commitment to trainee academic growth, which along with other programmatic elements, may have increased faculty engagement in mentorship.

Areas for improvement relate to difficulties in meeting everyone’s preferences for timing of this rotation since only a few residents can be pulled from clinical rotations at once. While in general, residents appreciated having the meetings prescheduled to reduce their perceived imposition on their advisors, those who already had a robust mentorship team found limited value in an additional assigned Faculty Champion. A few residents suggested providing additional resources to support those with specific interests in developing their leadership skills and pursuing careers in entrepreneurship. Overall, residents expressed hope that the ADB would continue to be a feature of our residency program.

Analysis of institutional grants data to date shows a higher proportion of residents who successfully applied for professional society or NIH F32 grants as well as a greater amount of total funding awarded prior to starting PDT in both of the 2 cohorts who participated in at least



**FIGURE 3.** Research funding earned by resident cohorts. Funding data include NIH F32 or major society grants, but not institutional T32 grants, which were submitted prior to the start of PDT. Data may not include society grants submitted by residents pursuing PDT at different institutions. \*Participated in PGY-3 ADB only. \*\*Participated in PGY-2 and PGY-3 ADBs.

1 ADB, compared to all 4 of the most recent cohorts prior to implementation of ADBs (Fig. 3). This equated to an over 5-fold increase in total funding earned per resident: from an average of \$10,900 in cohorts before the ADBs to \$56,700 in cohorts with at least 1 ADB.

## DISCUSSION

We report here the design and implementation of an academic development-focused 2-week rotation for PGY-2 and PGY-3 residents with the goal of facilitating their career planning and preparation for their subsequent PDT. End-of-rotation feedback and more detailed interviews with participants supported our hypothesis that time and support for identifying mentors, research opportunities, and funding mechanisms facilitated and enhanced their perceived preparedness for their PDT. Residents appreciate the flexible structure and protected time to create a strategic plan for their academic development. Additionally, we note that the ADBs had perceived benefits for all residents, even those who did not pursue PDT.

While it appears that the 2 weeks of protected time are the program’s primary asset, we acknowledge that the ADBs occur in the context of ongoing departmental investment in a more comprehensive and resident-specific Academic Development Program, including seminars and other mentorship infrastructure. Overall, the department’s multifaceted academic development efforts are mutually reinforcing this training model. Disseminating rosters and hosting seminars which highlight past PDT residents’ mentors and activities may stimulate junior resident interest in new topics and facilitate connections which may then help streamline their ADBs. Similarly, collating information on potential grant opportunities across various research domains might spark

junior residents' interest in applying, especially since they now have dedicated time to do so. The change in institutional culture is also evidenced by the attendance of various faculty surgeons and researchers at residents' final presentations at the end of their ADBs.

The optimal timing for the ADB in a resident's training depends on institutional and personal factors. At our institution, where PDT occurs after PGY-3, residents tend to develop their research interests and plans later in their PGY-2 year, after they have adjusted to the transition from intern year to roles with more autonomy and responsibility. In general, our PGY-3s preferred blocks earlier in the academic year to meet grant deadlines, while PGY-2s preferred rotations later in the year to allow time for introspection and clinical growth. These timing concerns may be particularly relevant at programs where the PDT follows PGY-2 year. Finally, we found that 2 weeks was an appropriate duration for residents to accomplish the necessary tasks and was logistically feasible in the context of other clinical rotation schedules and needs.

Departmental leadership support is critical for the implementation of an ADB. The creation of the ADB was accompanied by an overall increased investment by departmental leadership of time and resources into residents' academic development. A dedicated faculty leader charged to the success of this program (such as the Vice Chair of Research) who can effectively liaise with the resident leaders in a collaborative manner is essential to the socialization of the program among faculty and residents. The program's creation was catalyzed by the input of residents who wanted to address the difficulties of planning their PDT and successfully apply for grants despite the constraints of their regular clinical rotations. Consequently, a fundamental aspect of the ADB is protection from clinical responsibilities so that residents can brainstorm and delineate their goals and needs without the time pressures arising from their clinical duties. Because residents are scheduled for a small amount of clinical cross-coverage during this 2-week block, we designate the ADB as a clinical "float" rotation in order to meet the American Board of Surgery's requirement to complete at least 48 weeks of clinical work each year.<sup>12</sup> We acknowledge that the ability to provide residents protected time or the exact nature of clinical coverage will depend on the residency program's size and rotation structure. Another important consideration in the implementation of such a program is the cost to the department. Besides time from faculty and residents and financial support for dedicated administrative staff (who had already been working with departmental leaders on other research and faculty development initiatives), implementing the ADBs incurred minimal costs.

As of the most recent national analysis in 2006, it is estimated that over 600 surgical residents are pursuing PDT at a given time. While institutions have variable approaches to manage resident compensation during PDT, the overall cost of these PDT activities exceeds \$40 million per year. Of this amount, approximately 40% is supported by the residents' own surgical departments, 24% is supported by institutional grants such as NIH T32 grants, and 17% is supported by individual NIH or society grants.<sup>1</sup> It has been shown that the enactment of a protected funding mechanism, contingent upon residents applying for external grants, can facilitate increased participation in PDT without significant departmental expenses.<sup>13</sup> While the primary aim of our efforts was to augment our residents' transition into their PDT, we further hypothesize that ADBs may even provide some return on investment by helping residents obtain grant funding beforehand and leading to increased academic productivity during their PDT. While our early data on successful resident grant applications are promising, we recognize it may take time for lasting trends to become apparent. We will continue to monitor these data prospectively, in addition to other metrics of success including residents' overall satisfaction after completing their PDT.

We acknowledge that this work has limitations. Our experience at a single, large, academic institution may not be generalizable across all programs given differences in training models, timing of PDT, and number of residents available for clinical coverage. We believe similar programs may be implemented at other residency programs without excessive costs. Additionally, we took a pragmatic approach to the implementation of the ADB and chose to make it available to all residents as soon as feasible within the schedule, rather than a stepwise implementation as a controlled trial (thus a lack of control or preintervention data collection). Our intention for the program evaluations and analyses are to iteratively revise the program to suit the diverse needs of our residents. Based on the feedback indicating our current approach is working well, we do not anticipate any major programmatic changes for the next academic year. Ongoing efforts may relate to offering more structured opportunities for career discernment and leadership training for residents who are interested.

In conclusion, a short academic development rotation protected from clinical responsibilities is a feasible and well-regarded intervention to help residents refine their career goals and prepare for their PDT. Introducing a similar program may be of interest to residency programs seeking to foster their residents' academic career development.

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## SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jsurg.2024.08.015](https://doi.org/10.1016/j.jsurg.2024.08.015).