

## Scholarly Activity Training during Residency: Ensuring a Meaningful Experience for All Graduates

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Learning the basic principles of scientific research and participating in scholarly activity are critical parts of the residency experience and are mandated by the Accreditation Council for Graduate Medical Education (ACGME).<sup>1</sup> Participating in scholarly activity may benefit residents by helping cultivate their skills in appraising scientific literature critically and fostering self-directed learning.<sup>2-4</sup> A robust experience may also help residents to develop meaningful relationships with faculty mentors and nurture an interest in pursuing a fellowship and academic career.<sup>4</sup> This factor is increasingly important given the need to develop more physician scientists and the critical shortage of subspecialists in many pediatric disciplines.<sup>5-7</sup>

The ACGME requirements around scholarly activity training and participation are vague, however, and how programs choose to implement these requirements varies widely. The result is that many pediatric residents and program directors are unsatisfied with the state of scholarly activity training.<sup>8,9</sup> Failing to provide residents with a meaningful experience is an important opportunity missed by some training programs. The purpose of this article is to describe a longitudinal scholarly activity training program that we believe can serve as a model for other programs working to establish or enhance this facet of their resident training experience. We focus in particular around key lessons learned that can be helpful for chairs and other educational program leaders.

### Program Structure

We designed our program with the overall goal that every resident will receive training in the conduct of scientific research and execute a rigorous scholarly project, regardless of their career interests. Unlike many other published models, our program does not consist of a mandatory block of research time, nor do we have specialized research tracks or pathways.<sup>10-16</sup> Rather, all residents identify a scholarly project and mentor by fall of their second year and carry out a scholarly project over the course of the next 2 years. Project types vary. Over the past 5 years, 60% of projects have been clinical research, 20% medical education research, 10% quality improvement, and 5% health services research and basic science research respectively. Participation in continuity clinic-based quality improvement

projects that are part of the experience for all residents, developing educational material or conferences (without a formal assessment), and case series writeups do not satisfy our scholarly activity requirement.

Most residents work on their project during outpatient blocks, when combining scholarly work with clinical responsibilities will not violate duty hours. Residents can also use up to 6 weeks of elective time over 2 years to work on their project. Adopting this approach allows residents flexibility in tailoring their schedules and we believe aligns well with the individualized curriculum specified by the ACGME.

The associate program director (APD), who has extensive formal research training, devotes approximately 25% of her 50% protected time as APD to overseeing the scholarship program. As part of this responsibility, the APD heads the resident research oversight committee (RROC), a committee of 10 faculty members from various disciplines that meets monthly to review the progress of each resident. Each RROC member advises up to 4 residents. Their job is to help the resident identify a project and mentor, ensure the mentee is meeting project milestones, and help the mentor-mentee pair to navigate any obstacles in executing the project. Residents update their advisor monthly via email or in person. In addition, RROC members conduct a full scientific review of all pediatric resident research protocols that are not exempt from the institutional review board. This helps to ensure not only that the project is scientifically sound, but also that it is feasible and appropriate for a resident.

In addition to communicating regularly with their RROC advisors, residents must communicate at least monthly with their project mentor. We have developed standardized communication forms to guide the development of premeeting agendas and delineation of action items with timelines. Use of these forms is optional and not tracked.

All residents must present 2 research in progress updates at morning report—one during the spring of second year and one in the fall of third year. Medical students rotating in pediatrics, residents, faculty mentors, RROC members, the program directors, and the chair attend these sessions. Each resident must also give a final presentation to the entire

ACGME	Accreditation Council for Graduate Medical Education
APD	Associate program director
RROC	Resident research oversight committee

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department at Professor Rounds in June of their senior year. Each presentation is 10 minutes long and modeled after a platform presentation at a national meeting. We developed template slides to help standardize and guide presentations.

The APD and another RROC member also deliver a series of 10 educational conferences on conducting scientific research (Table I; available at [www.jpeds.com](http://www.jpeds.com)). Much of this material has been made publicly available on MedEdPortal.<sup>17</sup> These sessions are interactive, allowing junior and senior residents the opportunity to work through and refine their scholarly projects while receiving facilitated feedback. All educational conferences are required; however, actual attendance varies depending on the rotation schedule (eg, residents in the intensive care unit and emergency department attend separate educational conferences that are rotation specific). The curriculum repeats every 1.5 years to help ensure that all residents will attend most if not all of these sessions during residency. Conference material is available to all residents on our online educational management system, MedHub.

Several other resources are in place to support residents and faculty. First, our department has contracted with the Division of Biostatistics in the Department of Healthcare Policy & Research to provide biostatistical support for every resident project. Second, we award partial travel scholarships for accepted scholarly work. Although no funding is provided to residents to conduct their projects, a few residents have secured Community Access and Child Health (CATCH) grants. Third, we have conducted multiple faculty development sessions on being an effective resident research mentor and we host an annual “thank you” lunch for faculty mentors. Fourth, all material related to the research program (such as goals and objectives, expected project timelines, and slides from educational conferences) are available to faculty and residents through MedHub. Last, we award a research mentoring faculty award and a resident research award annually.

Of note, we discuss our scholarly activity program with all prospective resident applicants. This might be leading to the selection of residents with an interest in pursuing research or an academic career. About 60%-75% of graduating residents pursue subspecialty training, although this fluctuates significantly from year to year. Medical students on their pediatric clerkship typically attend at least 1 educational research conference or a resident research in progress session. This process has helped to facilitate the addition of medical students to many resident projects.

## Program Outcomes

We have been tracking our resident productivity outcomes over the last 5 years, with productivity defined as a resident presenting their scholarly work at a regional, national, or international meeting; publishing a manuscript during residency; or publishing a manuscript after graduation based on their scholarly project (Figure; available at [www.jpeds.com](http://www.jpeds.com)). Although we did not formally track outcomes before 2013, the number of productive residents was quite low. In the past 5

years, 98% of residents have successfully completed a scholarly project and presented their work at Professor Rounds. Each year, 42%-68% of residents have been productive, with 32%-58% of residents presenting at national or international meetings and 11%-21% publishing articles. Comparatively, a 2014 national pediatric program director survey found that, on average, 13% of residents per program present their scholarly work at a national or international meeting, and 8% publish.<sup>8</sup> Most residents presenting nationally present at the Pediatric Academic Society meeting. However, multiple residents have also presented their work at subspecialty meetings such as the Society of Critical Care Medicine meeting, the Annual Society of Hematology Meeting, the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition meeting, and the Association of Pediatric Program Directors meeting. Example project titles and productivity outcomes are provided in Table II (available at [www.jpeds.com](http://www.jpeds.com)).

Tracking productivity among graduates, such as publications, faculty appointments, and K-series awards, is an area of great interest. However, it has been challenging, in part owing to the inability to maintain accurate contact information, in addition to changes to the last names of many graduates after marriage. Weill Cornell Medical College is currently piloting use of the VIVO dashboard specifically to track the publication outcomes for any former resident, which, if successful, will help greatly with this process.

## Enhancing Mentorship and Fostering the Professional Growth of Faculty

In addition to benefiting residents, this program has helped to widen the breadth of faculty mentors within the department and supported the professional growth of faculty. At the outset, only a small group of faculty members served as resident mentors, with the majority being senior faculty who had extensive research experience. Over time, an increasing number of faculty members have mentored residents. This includes junior faculty, as well as senior faculty with less experience, conducting research and mentoring residents. We attribute this growth in mentorship to several factors: (a) faculty development, (b) supporting inexperienced faculty who wish to mentor residents by pairing them with experienced RROC members, and (c) a broader dissemination of departmental research activities through Professor Rounds and research in progress sessions. By becoming involved as mentors, faculty not only enhance their personal academic productivity, but also become increasingly comfortable mentoring residents on future projects. This process has greatly broadened the potential pool of capable faculty mentors within our department. In addition, an increasing number of junior faculty have participated on the RROC, which initially consisted primarily of senior researchers or division chiefs. Participation on the RROC is recognized by the chair as an important departmental contribution and is included in the chair's letter when advocating for a faculty member's promotion.

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