

A Faculty Development Model that Promotes Success of Early Career Faculty in Academic Medicine

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Introduction: Medical school offices of faculty development aim to facilitate the academic growth of junior faculty by fostering independent research, enhancing teaching skills, and bolstering career opportunities. The Rush Research Mentoring Program aims to achieve this goal at Rush University medical center by offering a broad resource armamentarium and creating an environment that fosters productive relationships between mentees and mentors. This article describes the program's structure, evaluation, outcomes, and the university vision for its future.

Methods: The program's contributions to the overall success of the University were measured by scholarly productivity, intramural and extramural funding, junior faculty retention, and mentee satisfaction with the program from its inception in 2006 until 2018.

Results: Over 12 years, mentees have collectively received 639 grants. Of the 130 mentees who have completed the 5-year program and transitioned to program alumni, 65% have been retained as faculty members, with 40% receiving promotions to associate professor and 5% to full professor. Mentees report frequent use of the available resources and high satisfaction with the program.

Discussion: We anticipate that structured mentoring programs with institutionally supported professional development activities and strategic mentor–mentee partnerships can be successfully adopted at similar academic medical centers.

Keywords: mentoring, faculty mentoring, mentoring resources, structured mentoring program, mentor–mentee partnerships

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Mentoring is the social foundation of research. In academic medicine, effective mentorship increases faculty scholarly productivity (eg, grants and publications), decreases time to academic promotion, increases faculty satisfaction and engagement, and makes faculty more likely to stay at their current academic institution.^{1–5} Through a mutually respectful, mindful, and accountable relationship, the mentor has the potential to draw out the best from the mentee by acting as an adviser, teacher, role model, and advocate.⁶ Such fruitful relationships are an ideal way to pass ethical and professional values to the next generation.⁷ Despite these benefits, most academic institutions do not directly address faculty mentoring as a core responsibility.

Disclosures: The authors declare no conflict of interest.

The Rush IRB provided the following statement regarding ethical approval of this study: "Based on the information provided, it has been determined that this project does not meet the definition of human subjects' research, as this research does not involve human subjects: (1) the data are not being collected through intervention or interaction with the individual; (2) they do not include identifiable private information; and (3) it is not a systematic investigation designed to develop or contribute to generalizable knowledge. Therefore, your project has been "Acknowledged" and does not require review by the Institutional Review Board (IRB) nor will you have to submit this project within the Rush Research Portal."

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The Rush University medical center established the Rush Research Mentoring Program (herein, described as "the Program") on July 26, 2006, which is a well-organized, institution-wide program that helps junior faculty develop and lead independent, extramurally funded translational research programs. The Program combines two approaches to prepare mentees to successfully compete for extramural funding: experienced and committed research mentors, and a wide resource infrastructure to enhance grant writing, professional skills, and communication abilities.

METHODS

Ethical Approval

The university's IRB determined that this study does not meet the definition of human subjects research and therefore is exempt from requiring review by the IRB.

Program Organization

There are 1921 core faculty members at Rush University of which 74% are early career. The university is part of the medical center. All physicians have faculty appointments at the university regardless of their employment relationships with the medical center. The university consists of four colleges and the Provost office with four vice-provost offices: faculty affairs, student affairs, research affairs, and academic affairs. All offices and colleges are well integrated and aligned and provide a great environment for mentor–mentee interactions. The Office of Mentoring Programs is housed within the Office of Faculty Affairs and offers four mentoring programs: research, education, postdoctoral trainees, and female faculty. The Research Mentoring Program includes

the program director, program coordinator, advisory committee that meets bimonthly to vet nominees, discuss program activities and resources, and develop policies; steering committee that meets every 6 months for general oversight; external and internal consultants/experts in specific fields; and the mentors and mentees who participate.

Recruitment of Mentees

Mentees are nominated by their department chairpersons or division chiefs/section heads to participate in the program. The steering committee meets with the nominee to verify that he/she has research experience and is capable of conducting the research project. Furthermore, the steering committee provides recommendations on potential collaborators, additional expertise, and resources and verifies that the nominee will have at least 20% protected time to work on the research project and participate in the program. Protected time is key for mentee's success. Mentees confirm that protected time has been allocated during the annual survey. They are also expected to dedicate additional personal time for research as needed. All new mentees are required to attend an orientation session and then participate in a monthly track meeting. There are two tracks in the program: basic research and clinical/population health research. Based on their research interests, mentees select an appropriate track. Unless they already have a mentor, new mentees consult with the program director, steering committee, and/or respective track leaders to partner with a lead mentor. Some mentees find additional mentors to complement their primary mentor's expertise, which is an approach shown to help meet diverse mentoring needs.

Recruitment of Mentors

Mentors are recruited into the program based on their ongoing research programs, existing mentorship relationships with junior faculty who subsequently join the program as mentees, or by invitation from the program director based on a match of research and/or clinical expertise with a mentee. The primary responsibility of mentors is to facilitate research training and assure mentee's engagement with the program. Responsibilities of mentors differ and depend on the nature of the mentor-mentee relationship, mentor availability, and the mentor's interests in various educational activities and resources offered by the program. The program resources are also available to the mentors for their own professional and academic development and act as an incentive to participate in the program. The program currently has 57 mentors, who are senior faculty from the medical college ($n = 50$), college of nursing ($n = 4$), or the college of health sciences ($n = 3$). Mentors are not compensated nor provided protected time for their commitment to the program and their mentees. Mentees are expected to drive the relationship with their mentors by initiating meetings and providing appropriate updates. Because mentors are more effective when they have received formal training, the program offers an online training module for mentors that outlines and clarifies expectations and responsibilities.

Program Alumni

After participating in the program for 5 years, mentees become independent investigators and demonstrate continuous productivity and engagement in research transition to "Program alumni" with continued access to the resources provided by the program. Program alumni also receive training through the National Research Mentoring Network to serve as mentors to

junior faculty and postdoctoral fellows, serve as reviewers of internal grant proposals and travel awards, and facilitate research track meetings.

Resources Offered to Program Participants

Resources to Enhance Scholarly Productivity

Mentees participate in a grant writing course that teaches the structure and flow of a specific aims page, best writing practices to enhance readability, and how to connect research goals to funding agency criteria for significance, innovation, and approach. A family provides annual philanthropic pilot grant support (\$100,000 total) for a maximum of five selected mentees to enable gathering of preliminary data for subsequent research proposals. An online training curriculum guides mentees in developing a career plan and a research proposal, toward the goal of preparing a successful NIH K grant application. Funding for writers, editors, statistical experts, and graphic designers to help mentees with their documents is also provided.

Mentees also have opportunities to meet and discuss their scholarly pursuits. Each of the research tracks, basic research and clinical/population health research, meets monthly to provide feedback on research proposals from mentors and peers. Through weekly manuscript writing groups, mentees provide mutual support and accountability. The annual university research symposium offers a venue to showcase research and stimulates interdisciplinary collaborations. Travel awards for participation in national conferences are granted to the abstract and poster winners from the annual research symposium and the mentee of the Year.

Resources for Professional Development

Various weekly professional development seminars and workshops are offered to prepare mentees for academic promotion in the university and leadership roles within professional societies. Mentee participation in external professional and leadership development opportunities is supported and sponsored by the office of faculty affairs. Educational resources (eg, books, electronic resources, etc.) on grant writing and many other professional development topics are also made freely available to mentees and mentors.

Program Evaluation

The office of mentoring programs conducts annual surveys using SurveyMonkey to collect information about funding obtained, submitted, and published manuscripts, presentations at professional conferences and meetings, awards, academic promotions, and overall satisfaction. Completion reminders are sent depending on the response rate. The surveys are also used to identify areas of potential improvement.

RESULTS

Since 2006, 192 mentees have enrolled in the program of whom 64% are self-reported female faculty. There are currently 78 mentors. Of the 130 mentees who have graduated to program alumni after 5 years of active participation, 65.4% (85/130) stayed as faculty members, with 40% of these (34/85) promoted to associate professor and 5% (4/85) to full professor. Currently, Rush invests approximately \$3000 annually per mentee, including administrative costs, consultant fees, and materials

and supplies. Mentees have secured, on average, \$2.93 M per year in funding (as principal investigators) in the last 12 years (Table 1). If we assume that much of this success could be attributed to the support and investment provided by the program, the return on investment (ROI) was 710% (~7-fold). If grants awarded with a mentee as a coinvestigator are included, the ROI increases to 1540% (~15-fold).

Specific resources have also proven beneficial to the mentees. The 24 recipients of the philanthropic fellowship have had a notable 100% funding success rate, with 12 successfully obtaining NIH funding and 12 receiving other types of funding. The retention rate of these fellows is 93%, and 27% have received academic promotions to associate professor within 2 years of completing their fellowship. Participants in the grant writing course, who include mentees and other faculty members, had a 66% funding success rate (calculated as proposals funded/reviewed by a funding agency).

Among the 66 respondents to the most recent survey, 62% strongly agreed that their department chairperson/section director is supportive of their research career. Most mentees (82.9%) reported meeting with their research mentor weekly, biweekly, or monthly. Sixty-five percent of the time, those meetings were in person, highlighting the commitment of mentors to facilitate the mentee's success. Mentees reported that they access program resources frequently and expressed great satisfaction with the resources that they can continue to access while moving forward in their career trajectories. When asked to recommend areas for improvement, mentees reported a need for additional senior mentors to serve as track meeting facilitators, one-on-one sessions with an external grant writing consultant, scientific grant reviews, opportunities to develop an independent research project without overlap with the mentor's research, and more informal connections with mentors outside of their college/department. They also reported that some program offerings conflict with other responsibilities (eg, clinical or teaching). Major strengths of the program as perceived by mentees included the networking fostered by the program, the inter-professional collaboration and mentoring outside of one's own college, the leadership and management of the program, and the resources necessary for success. Respondents appreciated the opportunity to better understand the entire research process, from study design, to grant writing, to manuscript publication. Mentees praised the opportunity to interact with other mentees and the feeling of being part of a "community" working toward the same goal.

DISCUSSION

The primary goal of this program is to use the proven benefits of mentoring¹⁻⁷ to enable junior faculty members to become independent researchers and establish funded research careers. Effectiveness has been demonstrated by high ROI, high promotion and retention rates, and consistently favorable qualitative assessments. Our high retention rate of 65.4% is consistent with previous reports that mentoring reduces early faculty attrition rates.^{8,9} However, the field of faculty mentorship research still lacks standardized assessment tools for most outcomes to assess and compare mentoring programs between institutions.^{10,11}

Kashiwagi et al¹² published a systematic review that compared 18 mentoring programs in academic medicine to

TABLE 1.

Scholarly Productivity of the 192 Mentees Who Have Participated in the Research Mentoring Program Since It Was Established in June 2006

Total funding (direct cost)	\$87,642,493
As principal investigator	\$35,204,115
As co-investigator	\$52,438,378
Total funding (indirect cost)	\$45,574,096
As principal investigator	\$18,306,140
As co-investigator	\$11,442,136
Total number of grants awarded	639
NIH grants	235
Other grants	394
Total number of publications	1020
Publications per mentee	5.3
No. of podium presentations	805
No. of posters	596

identify components of a successful mentoring program: mentor training, oversight committees, mentor-mentee contracts, mentor-mentee pairing, professional development training, seminar series, and resources. The RRMP model was framed around these components to address reported challenges facing junior faculty such as difficulty finding mentors and accessing resources¹³ and provide valued resources such as protected time.^{3,12} Thorndyke et al¹⁴ and Law et al¹⁵ found that including resources for mentees, in addition to protected time and internal funding, was critical to sustain a successful mentoring program. Providing resources to program alumni also encourages a successful transition from mentee to independent investigator.

The mentoring approach described in this article can be adapted to other medical centers. It requires assessing junior faculty needs, the potential pool of mentors, resource allocation, program management, oversight, and frequent evaluation based on stakeholders' feedback.

LESSONS FOR PRACTICE

- The Rush University Medical Center's Research Mentoring Program has resulted in high faculty retention, satisfaction, and scholarly productivity of mentees.
- An integrated mentoring program facilitates the connection of mentees with appropriate mentors who can guide them to become independent researchers.
- Resources are an integral part of mentee success and satisfaction and continuing to provide these resources after program completion facilitates faculty members' success as their careers progress.

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