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# Effective Research Mentoring of Radiology Residents

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Mentoring systems are now common in most radiology residencies. A resident may have multiple mentors for different purposes, such as research, ethical issues, and career planning. The mentoring relationship that pertains to research and publication of medical literature can be mutually advantageous to both the faculty and resident. Residents can achieve their first radiology publication or presentation, and the faculty mentors can defer the tedious data collection to their residents. Many residents, especially those without aspirations for academic radiology, will only participate in a single project to fulfill program and ACGME requirements. The mentoring relationship requires effort from both parties, especially in the beginning, but a positive experience can lead to multiple successful research projects from a single resident. Residents' choice to participate in additional projects beyond what is required can be greatly influenced by their relationship with their mentor on their first project.

Although ubiquitous, research can seem inaccessible and intimidating for residents early in their training. Most medical students do not enter into medical schools with research-heavy curricula or MD-PhD programs. Few students are fully educated in their medical school curriculum about the process of assembling a manuscript worthy of submission to a journal, and even

fewer are familiar with the logistics of an institutional review board document or grant proposal. Many intelligent, hardworking students focus all of their energy on excelling in their medical education, passing standardized tests, and subsequently earning spots in the country's best residencies. These students may participate in research to be involved in their future specialties, but the primary focus of their time and energy is not research. Therefore, most lower-level radiology residents are not fully equipped to choose a project and publish it without guidance. For many residents, this author not excluded, the idea of research and publication of scientific papers seems intimidating and too lofty of a goal when the call shifts are frequent and the learning curve is steep.

Active mentoring of lower-level radiology residents in basic research and the process of medical publication can break down this mental barrier. New residents will be more likely to participate in projects if they are set up for success by an organized mentor who remains available for questions and manuscript review. If a resident has minimal experience with research, piecemeal assignment of simple tasks such as data collection, compiling relevant articles and references, and writing an abstract can make a larger project more palatable.

Follow-up is also an important aspect of the mentoring process. An

e-mail or a simple conversation a week after a project's conception is encouraging and portrays availability by the mentor. Deadlines, even if arbitrary, give structure and urgency to the project. The beginning of a big research project can be the most daunting step. Providing examples of articles similar in format and concept as the desired project creates a scaffold for the project and makes this step less intimidating. Although this may seem like a great deal of hand-holding, this is actually quite straightforward and can be done via a few e-mails.

When the time comes for manuscript submission, mentors' guidance through the process for residents' first publication is an investment that will benefit the residents for the rest of their academic careers. Guidance through tasks such as writing a cover letter and assembling the manuscript according to the journal's instructions may seem like a menial endeavor, but many residents have no experience with these tasks. Even if a mentor's guidance is to let the resident submit the paper online and be available for questions, that experience will give the resident confidence and independence in future projects.

I had two strong female research mentors during my residency—one of whom, the coauthor of this article, has been instrumental in the professional development of many residents in our institution early in training. She begins by recruiting

lower-level students to participate in writing abstracts to submit as educational exhibits at a national meeting. For those of us who have very little experience with such projects, she gives clear stepwise instructions for assembly of the manuscript. She sends follow-up emails to assess the status of the project and answers any questions in an expeditious manner. The simple act of answering e-mails quickly portrays availability and investment in the person and the project.

Another undervalued action from mentors is positive reinforcement. A simple “good job” to show approval of a mentee’s work can go a long way in the mentoring relationship. Both of my mentors in residency regularly check their e-mail and have an organized response within the day or the next morning when I have questions. They provide positive feedback when

appropriate. Both portray a genuine interest in our projects and my professional development. This encouragement gave me the confidence I needed as a lower-level resident to participate in additional projects with them and other faculty.

Conversely, the faculty members with whom I have had negative experiences either take so long to respond to my inquiries that I have asked someone else, or they respond quickly with a haphazard answer. Also, when it comes to editing a manuscript or project, timely feedback is preferred. Faculty members who take several weeks to provide feedback on a project or those who put forth a speedy response with suboptimal effort can make a resident lose confidence and interest in the project. Unfavorable mentoring relationships can also occur when the resident performs the majority of the

research and writing and is ultimately underrepresented in the arrangement of author order of a publication. These habits from some of my previous mentors have led me to turn to other faculty as mentors in subsequent projects. As a resident, I value availability and organization the most in a research mentoring relationship, particularly when it comes to research and publications.

Guiding residents through their first publication sets a foundation for future projects and furthers the mentoring relationship. Residents will be much more likely to agree to participate in additional projects if they believe their mentor is available and organized and if the projects proposed are likely to be successful. A few e-mails of advice, instruction, and encouragement from a mentor can be the cornerstone of a lasting mentoring relationship.

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