Research Resources Survey:

Radiology Junior Faculty Development

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Rationale and Objectives: To assess resources available to junior faculty in US academic radiology departments for research mentorship and funding opportunities and to determine if certain resources are more common in successful programs.

Materials and Methods: An anonymous survey covering scientific environment and research mentorship and was sent to vice-chairs of research of radiology departments. Results were evaluated to identify practices of research programs with respect to mentorship, resources, and opportunities. Academy of Radiology Research's 2012 National Institutes of Health (NIH) grants and awards list was used to determine if environment and practices correlate with funding.

Results: There was a 51% response rate. A greater fraction of clinical faculty gets promoted from assistant to associate professor than research faculty. Research faculty overall submits more funding applications. Most programs support start-up costs and K-awards. Over half of the departments have a vice-chair for faculty development, and most have formal mentorship programs. Faculty members are expected to teach, engage in service, publish, and apply for and get research funding within 3 years of hire. Top-tier programs as judged by NIH awards have a combination of MDs who devote >50% effort to research and PhD faculty. Key factors holding back both clinical and research junior faculty development were motivation, resources, and time, although programs reported high availability of resources and support at the department level.

Conclusions: Better marketing of resources for junior faculty, effort devoted to mentoring clinical faculty in research, and explicit milestones/expectations for achievement could enhance junior faculty success, promote interest in the clinician–scientist career path for radiologists, and lead to greater research success.

Key Words: Junior faculty; development; research; mentorship.

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There is significant concern in the medical research community (1–4) that there are not enough clinically trained scientists (specifically those with an MD, although overall it includes all allied health professionals) engaging in research, and if we want to sustain and increase the quality of research being conducted today, we need to find ways to improve our education, recruitment, and mentorship of these talented and creative individuals. Radiology is no exception to these concerns (5–8). A key aspect is training, and there has been a substantial amount of effort directed toward increasing research training and mentorship during residency (9). In radiology for example, the American Board of Radiology established in 1999 the Holman Research Pathway (HRP) to stimulate the development of future academic researchers and educators (10). To date, the program has trained a number of candidates (73 [80%] radiation oncology and 19 [20%] diagnostic radiology from 2002 to 2014) with a high percentage remaining in academic practice, obtaining research support and publishing results.

A key aspect of the HRP is mentorship, but most residents do not seem to identify mentors (11), and the question arises as to whether mentorship in general extends beyond residency to junior faculty (12). One recent study surveyed junior medical faculty to understand some of the factors that might be barriers to recruitment and retention of junior faculty (13). The study found that role models, a few years ahead of junior faculty, tend to increase commitment to academic careers, and that mentorship experiences during residency provide significant incentives to pursue an academic career. Interestingly they also found differences between men and women, with women noting a lack of researcher role models (midcareer, female researcher models), and overall men valued advice on finances, whereas women valued advice on work–life balance. Suggestions for the final point (work–life balance) included having a mentor closer in age to the mentee, having more than one mentor, and having mentors with similar values.

To better elucidate current practices for developing junior faculty in the area of research, the Radiological Society of North America (RSNA) Vice-Chairs of Research Committee surveyed vice-chairs of research of radiology departments in the United States. A subset of the questions specifically pertained to junior faculty development and research mentorship

to identify what resources and services departments are offering their faculty. The results were compared with the Academy of Radiology Research's listing of National Institutes of Health (NIH) grants and awards in 2012 (http://www.acadrad.org/nih-rankings-grants/NIH-Rankings-2012.pdf) to determine if there are any significant relationships between these variables and research success. Department size was also considered as a variable.

MATERIALS AND METHODS

The RSNA Vice-Chairs of Research Committee, which is composed of basic (PhD, $n = 26$; 2 others) and clinical (MD = 57; MD-PhD = 10) radiology researchers, iteratively developed a survey to elucidate best practices for developing junior faculty in the area of research. The set of questions was initially developed by a small group of volunteers who iteratively refined them in terms of content and wording. It was then sent to the entire group for feedback and revised accordingly.

The 57-question survey included a section on basic department demographics (13 questions) and a series of questions pertaining to faculty development (22 questions), core services/facilities, and financial structures (22 questions). This article reports on the faculty development results.

The survey (Appendix) was created in SurveyMonkey, and a link to the survey was sent to a convenience sample of 95 vice-chairs of research in US radiology departments during the summer of 2012 by the RSNA with a request for participation. It was a convenience sample as the RSNA had a list of academic radiology departments that was provided to us for the survey. The survey was not sent to radiation oncology departments although some institutions may not separate these two departments (this was not a question). The survey was anonymous (in terms of who completed the survey, although institution was noted), and no incentives were offered for participation. A follow-up request was made to encourage a higher response rate.

For analyses, the junior faculty development questions were divided into four categories: identifying successful programs, budgets and mentoring, expectations and mentoring, and support and challenges. For most of the questions, responses were requested for mainly clinical (>50% effort/time) versus mainly research faculty (>50% effort/time).

RESULTS

There was a 51% return rate (Table 1), although not everyone responded to every question. In terms of identifying successful programs, the first question was "Over the past 10 years how many Assistant Professors were promoted to Associate Professors vs did not get retained when it came time for promotion?" Overall, 65.2% of clinical faculty members were promoted, whereas 50.0% of research faculty members were promoted. The second question was "Over the past 5 years

TABLE 1. Institutions Responding to Survey

Beth Israel
Brigham and Women's Hospital
Duke University School of Medicine
Emory University School of Medicine
Indiana University School of Medicine
Massachusetts General Hospital
Mayo Foundation
MD Anderson Cancer Center
Memorial Sloan Kettering Cancer Center
Methodist Hospital Research Institute
Mount Sinai School of Medicine
New York University School of Medicine
Northwestern University Medical School
Ohio State University College of Medicine
Pennsylvania State University College of Medicine
Stanford University School of Medicine
SUNY Stony Brook Health Sciences Center School of Medicine
University of Arizona College of Medicine
University of California San Diego School of Medicine
University of California Davis School of Medicine
University of California, San Francisco
University of Chicago Pritzker School of Medicine
University of Iowa College of Medicine
University of Massachusetts Medical School
University of Miami School of Medicine
University of Michigan Medical School
University of Nebraska College of Medicine
University of North Carolina Chapel Hill
University of Pennsylvania School of Medicine
University of Texas Southwest Medical Center Dallas
University of Texas Health Sciences Center San Antonio Med School
University of Washington School of Medicine
University of Wisconsin Medical School
Vanderbilt University School of Medicine
Wake Forest University School of Medicine
Washington University School of Medicine
Yale University School of Medicine

how many external funding applications (e.g., NIH, foundation, professional society) have been submitted from clinical vs research full professors, associate professors, assistant professors, lecturers, and other faculty?" Overall, a significantly greater percentage of research faculty members submit funding applications at all levels ($F = 4.202$, $P = .0004$) than clinical faculty (Fig 1).

For budgets and mentoring, 81.5% of the respondents indicated that they routinely support start-up costs, with the average package amount being $334,377 (standard deviation, $261,906; median, $262,500). The majority (80.8%) support clinical faculty applications for NIH K-awards, and 65.4% have no cap on the number of clinical faculty supported by K-awards at a given time. Figure 2 shows the percentage of mainly clinical faculty who are involved in research (funded or unfunded) as a function of the total number of MD faculty.