Title
Mentoring in Pediatric Oncology

Journal
Journal of Pediatric Hematology/Oncology, 35(6)

ISSN
1077-4114

Authors
Levy, Adam S
Pyke-Grimm, Kimberly A
Lee, Dean A
et al.

Publication Date
2013-08-01

DOI
10.1097/mph.0b013e31829eec33

Peer reviewed

Published in final edited form as:
J Pediatr Hematol Oncol. 2013 August ; 35(6): . doi:10.1097/MPH.0b013e31829eec33.

Mentoring in Pediatric Oncology: A Report from the Children's Oncology Group Young Investigator Committee

Adam S. Levy, MD* **[Associate professor of clinical pediatrics]**,
Children's Hospital at Montefiore, Albert Einstein College of Medicine, Bronx, New York

Kimberly A. Pyke-Grimm, RN, MN* **[CNS]**,
Clinical Nurse Specialist in Hematology, Oncology and Stem Cell Transplant, Bass Center Day Hospital and Clinics, Lucile Packard Children's Hospital at Stanford, California

Dean A. Lee, MD, PhD [Assistant professor],
Division of Pediatrics, University of Texas, MD Anderson Cancer Center, Houston TX

Shana L. Palla, MS [Principal Statistical Analyst],
University of Texas, MD Anderson Cancer Center, Houston TX

Arlene Naranjo, PhD [Research assistant professor],
Department of Biostatistics, University of Florida, Colleges of Medicine and Public Health & Health Professions, Gainesville, FL

Giselle Saulnier Sholler, MD [Associate professor],
Van Andel Research Institute

Eric Gratias, MD [Associate professor],
Division of Pediatric Hematology/Oncology at the University of Tennessee College of Medicine, Chattanooga, TN

Kelly Maloney, MD [Associate professor],
Center for Childhood Cancer and Blood Disorders, Universty of Colorado and Children's Hospital, Denver, Colorado

Farzana Parshankar, MD [Associate professor],
Pediatric Hematology/Oncology, Yale University, New Haven, CT

Michelle Lee-Scott, CCRP [Clinical research associate],
Department of Hematology/Oncology Hospital for Sick Children, Toronto, Ontario

Elizabeth A. Beierle, MD [Associate professor in surgery and pediatrics],
University of Alabama, Birmingham AL

Kenneth Gow, MD [Associate professor],
Department of Surgery, University of Washington, Seattle WA

Corresponding Author: Adam Levy, MD, Children's Hospital at Montefiore, 3415 Bainbridge Avenue, Bronx, New York 10467, adlevy@montefiore.org, phone: 718-741-2342 fax:718-920-6506.
*indicates equal contribution to this manuscript.

Disclaimers: none

Contributor's Statement Page
The authors have no conflicts of interest or funding to disclose.
Each listed author made substantive intellectual contributions to this manuscript using the following criteria:

1. Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data.
2. Drafting the article or revising it critically for important intellectual content; and
3. Final approval of the version to be published.

Grace E. Kim, MD [Professor],
Department of Pathology at University of California San Francisco. University of California, San Francisco, CCA

Stephen Hunger, MD [Full Professor],
Center for childhood cancer and blood disorders, Univeristy of Colorado and Children's Hospital, Denver, Colorado

Franklin O. Smith, MD [Professor of Medicine and Pediatrics], and
University of Cincinnati Cancer Institute and Division of Hematology/Oncology, University of Cincinnati College of Medicine, Cincinnati OH

Terzah M. Horton, MD, PhD [Assistant professor]
Division of Hematology-Oncology, Department of Pediatrics, at Baylor College of Medicine, Houston TX

Abstract

A formal Mentorship Program within the Children's Oncology Group (COG) was established to pair young investigators (mentees) with established COG members (mentors). Despite the AAP policy statement promoting mentorship programs, there are no publications describing and evaluating national mentorship programs in pediatric subspecialties. In this study, a series of internal program evaluations were performed using surveys of both mentors and mentees. Responses were de-identified and analyzed to determine the utility of the program by both participant satisfaction and self-reported academic productivity. Results indicated that mentees were generally satisfied with the program. Mentor-mentee pairs that met at least quarterly demonstrated greater academic productivity than pairings that met less frequently. This formal mentorship program appeared to have subjective and objective utility for the development of academic pediatric subspecialists.

Keywords

mentorship; pediatric oncology

INTRODUCTION

In 2001, The American Academy of Pediatrics (AAP) published a policy statement promoting mentorship in pediatric research (1). In addition to stressing the need for mentorship during medical school and residency training, the need for mentors throughout an academic pediatrician's career was highlighted. The Committee recommended that professional organizations establish programs to foster continued research training for academic faculty and suggested that opportunities to participate in research activities be expanded. Likewise, the U.S Institute of Medicine and the National Institutes of Health (NIH) suggested that improving mentorship is important to reverse a trend of fewer physician investigators leading research studies (2, 3). The best way, however, to prepare physicians for patient-oriented research careers remains to be defined (4). There are limited publications describing mentorship programs in medical research and even fewer reports describing the outcomes of such programs (3, 5–10). Some studies suggest active mentorship enhances an investigator's academic productivity and career satisfaction (4, 11, 12). Despite the AAP policy statement promoting mentorship programs, there are no publications describing and evaluating national mentorship programs in pediatric subspecialties.

Because of the rarity of childhood cancers, most children with cancer in North America are treated in tertiary care academic institutions. A majority of these patients are enrolled on NIH-funded National Cancer Institute (NCI)-sponsored pediatric oncology clinical trials. The Children's Oncology Group (COG) is the largest of these cooperative groups and includes over 200 treating institutions and has over 7000 members. The COG is divided into 30 disease and subspecialty committees. Given the number of COG members and the inherent bureaucratic structure of such large organizations, learning how to become active an participant in COG-sponsored research can prove challenging for junior COG members.

In 1996, a Young Investigator Program was established within a predecessor group of the COG, the Children's Cancer Group (CCG). Upon merger of two pediatric cooperative groups, the Young Investigator Program continued as the Young Investigator Committee (YIC) with the following goals: (1) to provide support and guidance for collaboration and to facilitate the interaction of young investigators in basic science and clinical research fields, (2) to identify successful investigators to serve as mentors for young investigators, and (3) to facilitate involvement of young investigators in COG administrative, disease and study committees. "Young investigators" were self-defined, but participants were usually within ten years of completing their subspecialty training. A formal Mentorship Program was established in an effort to pair young investigators (mentees) with mentors involved in COG activities. In this report, we describe the COG Mentorship Program (Fig 1), a series of internal program evaluations, and the utility of the program as determined by both the satisfaction its participants and their self-reported academic productivity.

METHODS

Data collection

As part of a quality improvement exercise, participants in the COG YIC Mentorship Program were asked to complete a confidential survey assessing the mentorship program (Supplement 1). Individual surveys were distributed to mentors and mentees in 2005, 2007, 2008 and 2009. These surveys assessed if the mentorship relationship was active, if the mentor and/or mentee found the relationship satisfactory, and if the relationship was productive. Surveys also assessed what each individual hoped to gain from the mentorship experience. Participants were asked if they had already identified a niche within pediatric oncology, and whether they believed it was important that the mentor have the same career focus. Finally, participants were asked to provide qualitative comments on the strengths and weaknesses of the mentorship program. Surveys were returned via email to YIC leadership and were de-identified for analyses. The data was gathered following the provisions of the Declaration of Helsinki and according to local IRB policies.

For this analysis, we considered the group of mentors and mentees with a single questionnaire time point (2005) as "Cohort 1" and the group from 2007–2009 (three questionnaire time points) as "Cohort 2." Cohort 1 included 48 mentees and 44 mentors (some mentors had more than one mentee). Cohort 2 included 31 mentees and 29 mentors. Four individuals were mentees in both cohorts such that overall there were 75 mentees and 73 mentors in the program over the course of time discussed in this manuscript.

Data assembly

Data was collected from Group 2 over three years (2007–2009). If more than one survey was returned over the mentoring period, results from each mentee were summarized as one data point per mentee using the highest reported frequency of meeting and highest reported fit scores between the mentor and mentee. Likewise, all reported mentor roles were condensed from multiple surveys for each mentee, as the roles in mentoring frequently

evolved over time. For correlative data regarding productivity, data from surveys of all 75 mentees from both cohorts were included in the analysis. For descriptive data regarding productivity, only surveys reporting productivity were considered. Mentees who did not respond to the questions regarding productivity or did not return a survey were considered to have had no productivity. Each positive self-report of productivity indicated on the survey was assigned a value of one and total productivity summed.

Statistical Analysis

The Mann-Whitney test was applied to determine significance of pair-wise comparisons. The Kruskal-Wallis test was applied to determine significance of meeting frequency, in discrete categories as reported, for measures of fit, productivity, and satisfaction. The Spearman correlation coefficient was used to determine the correlation of fit, productivity, and satisfaction measures with meeting frequency as a continuous variable. P values for a one-tailed test are reported under the assumption that increased meeting frequency would have a positive effect on outcome measures. Figures and statistics were performed with Prism, Macintosh version 5.0c.

RESULTS

Descriptors of the Mentoring Relationships

Two groups of mentee/mentor pairs were assessed. Forty-eight mentor/mentee pairs (Cohort 1) were surveyed during 2005, 2 years after their pairing. A second cohort of 31 mentor/mentee pairs (Cohort 2) were surveyed in 2007, 2008 and 2009. Twenty-nine of the 48 mentees enrolled in Cohort 1 of the program answered the survey (response rate 60%). Twenty-eight of 31 mentees in Cohort 2 responded to at least one survey over the course of their mentorship experience (response rate 90%).

In Cohorts 1 and 2, the YI mentees ranked what they hoped to gain from the program in the following order: (1) navigation into and within specific COG disease committees, (2) guidance on specific research projects, (3) collaborations to assemble manuscripts for publication, (4) general career guidance, and (5) aid in obtaining job contacts..

Roles performed by the mentors were not prospectively defined in this mentoring project. Mentees were encouraged to identify specific professional goals for the mentoring period in an open-ended manner. The survey asked mentees to retrospectively identify the roles that mentors had served in working towards those goals. Some mentees attributed multiple roles to their mentors. Pooling responses from both cohorts, mentees reported that “advisor” (75%) and “resource” (60%) were the most common roles for mentors in these relationships (Fig. 2A). Mentees reported the frequency of interactions with their mentors as shown in Fig. 2B.

Mentee Satisfaction

For Cohort 1, 22 of 29 (76% of respondents) were satisfied with the program. The mentee satisfaction rate for Cohort 2 was 90% in 2007, 60% in 2008, and 80% in 2009. Similar themes regarding satisfaction and dissatisfaction were noted by both cohorts. Satisfied mentees noted that the COG YI mentorship program was a starting point for their careers as COG junior investigators, allowing them to become more involved in COG and to build ties to allow for future collaborative work. They also commented on the advantages of having a mentor to guide them in accessing COG tissue resources and COG clinical data.

Dissatisfied mentees also reported common factors that impeded the success of their mentor/mentee relationship. Some mentees commented that their assigned mentors were extremely

busy and often did not have time for mentoring. They also commented that there were no defined goals, and that significant effort was needed by both the mentee and mentor to forge a productive mentee/mentor relationship. Other suggestions included allowing mentees/mentors to have a voice in their pairings, and funding for YI's travel to COG meetings to promote more personal interactions with their mentors. Dissatisfied members suggested that the YIC should keep track of their relationships and intervene early (within the first 3 to 6 months) to help or change suboptimal mentor/mentee assignments.

Mentee Productivity

In Cohort 1 in which 48 mentor/mentee pairs were assessed, 8 of the mentees presented abstracts at national meetings, 9 published papers in peer-reviewed journals, and 4 mentees became involved in active COG committee work. In Cohort 2, 16 of 31 pairings were objectively productive. Seven pairings resulted in a publication, 10 pairings resulted in a presentation, and 10 pairings resulted in active COG committee work. In Cohort 2, seven pairings resulted in two areas of productivity, and 2 pairings resulted in productivity in all three defined productivity areas (abstracts, publications and active COG committee work).

In most productive pairings, relationship strengths included a mentor that actively participated in the mentor-mentee relationship throughout the project. Reported mentor participation included giving start-up ideas for navigating through COG or Institutional Review Board approval systems and assisting with interactions with COG leadership.

Effects of mentee gender

Mentees reported "active" mentoring relationships and satisfaction with mentoring relationship at similar rates regardless of gender (Fig. 3A), with perhaps a slight trend among women towards more frequent interactions with their mentors (Fig. 3B). There were also no significant differences between genders in reported productivity resulting from the mentor-mentee relationship. (Fig. 3C)

Predictors of interaction frequency and of productivity as a measure of successful mentoring

The frequency of interactions correlated with the perceived degree of "fit" between the mentee's needs and the mentor's qualities (Fig. 4A) and how well the mentor's time expectations matched the mentee's (Fig. 4C). Importantly, the frequency of interactions did not simply correlate with mentee perceptions of fit, matching time expectations, and program expectations, but correlated strongly with reporting the achievement of objective outcomes of the mentoring relationship (Fig. 4B, D).

Mentor Surveys

In Cohort 1 21/44 mentors responded to the survey (48%). Of the responding mentors, 13/21 (62%) felt the pairing was active. The mentors were asked to rank in order of importance five areas that they might help a mentee. The majority of the mentors ranked guidance on specific research projects as the top reason for being a mentor. The second most important area was specific COG disease committee advice and introduction of mentees to COG committee leadership. The third most important area was general career guidance. Serving as a contact to obtain a job and collaborating to write papers for publication were rated as least important. The majority of the mentors felt it was important for the mentee to be differentiated toward a certain career niche within pediatric oncology. Although not universal, the majority of mentors also felt that they and their mentee should be in the same niche.

Mentors in 2005 indicated that strengths of the mentor/mentee relationship were generally encompassed in three themes: the opportunity to encourage future investigators and leaders, to ensure the future of COG, and to provide career opportunity for mentees. Perceived challenges in the program included the limited number of mentors, lack of funding, and lack of formal guidelines for the program. Many mentors hoped that the program would continue with more formality and official COG-sponsored events.

The mentors in Cohort 2 were asked how they had assisted their mentees. As reported by Cohort 1 mentors, assistance on specific research projects was the most common response. Cohort 2 mentors also noted program strengths and weaknesses similar to those outlined in Cohort 1.

DISCUSSION

The current study is the first comprehensive assessment of a mentorship program within a pediatric clinical trials consortium. We show here that a structured program of prospective mentor-mentee matching on the basis of interests resulted in successful mentoring. Mentees in both groups were productive, resulting in a total of 16 publications, 18 presentations, and 14 mentees becoming active in COG committee work. Of note, since clinical trial data may need many years to mature before publication, this assessment of productivity within the group may actually underestimate the ultimate productivity of these pairings.

The importance of mentorship in an individual's career development is widely believed to be self-evident. However, there is limited evidence that mentor programs provide benefits to participants or organizations in medicine (14, 15, 16), nursing (17, 18), or business (19). Of note, literature suggests that many mentorship programs do not establish a clear definition of mentorship nor clear guidelines or goals for program participants (mentees).

One recent systematic review examined the prevalence of mentorship and its effect on career development in medicine (15). There was an apparent positive impact of mentorship on research development and productivity. Mentorship relationships are quite common in medicine (20, 21), with 19–93% of individuals reporting a mentor-mentee experience (22). The perceived value of mentorship is notable in some specialties. For example, 95% of Adolescent Medicine faculty described their mentor as important (22). A recent study determined that academic general pediatrics division chiefs acknowledge the benefits of mentoring relationships, and suggested that pediatric societies could facilitate this area of professional development (23). The influence of gender on the mentorship relationship may also be important. A recent survey of pediatric surgeons determined that nearly one-half of female respondents believed inadequate mentoring limited their career development as compared to 36% of male respondents (24). However, in our study we found no significant differences in the mentor-mentee relationship based on gender.

Following the completion and evaluation of the 2005 cohort survey (Cohort 1) and the 2007 cohort survey (Cohort 2), changes were instituted to improve the program. The mentoring commitment was increased from two years to three years in order to encourage a longer-lasting, productive mentor-mentee relationship and to give time for project completion. Participants in the program were also encouraged to define goals with their mentors early in their relationship. The YI mentorship program was broadened to all members of the COG including physician members in pathology, radiation oncology, and surgery, as well as non-physician members in allied health fields including nursing, pharmacy, psychology and social work.

Based on feedback from the 2005 cohort, mentees were encouraged to suggest a mentor for their pairing and the YIC leaders had discussions with both the mentee and mentor prior to

pairings to ensure that interests were similar and that each person had the time to commit to the pairing. Closer monitoring of the pairings was initiated by the YIC, with communication with the mentee three months after the pairing to ensure that the pair had made contact and that they had defined goals for their pairing. The program also allowed for early re-pairing if the initial pairing was not a good match. We believe that the changes implemented strengthened thes program and encouraged future young investigators in pediatric oncology interested in COG investigative research.

Although not the only goal, one major goal of the YI mentorship program is to facilitate academic productivity for mentees, defined as publications, a presentations, and/or active participation in COG committee work. Within a mentoring program, it is important that the program prospectively address areas that impact the success of mentoring relationships. We found, as might be expected, that productivity – one of our objective measures– correlated with both a perceived match in mentor/mentee objectives, and adequate time commitments from both participants. and the needs/skills of the mentor-mentee pair. In general, the more frequent the interactions, the more likely the relationships were identified as active. Most importantly, the frequency of interactions did not simply correlate with mentee perceptions of fit and match, but correlated most strongly with mentee productivity. It is clear that mentoring programs should prescribe and encourage frequent interactions to maintain momentum and structure.

This study has several limitations as a retrospective survey. Surveys were done via questionnaires, creating a potential selection and reporting bias. To reduce the risk of reporting bias we assumed that those who did not respond to the survey had no productivity, thereby eliminating the risk of reporting overly positive results. The response rate, however, was relatively good for both mentors and mentees. The cohorts were also relatively small, limiting formal statistical analysis to common events between groups. There are some confounding issues that must also be considered. For example, individuals who are more persistent and engaged in the mentoring program may be more self-motivated than those who were less active in the program. Thus, attributing productivity to the program per se cannot be proven. On the other hand, those who did not respond to the survey may be those individuals who were least satisfied or found the program least effective.

In summary, this is the first comprehensive assessment of a mentorship program within a pediatric clinical trials consortium over time. While mentees perceive that mentors play a variety of roles, the mentors stated the key roles were guidance on specific research projects, COG disease-committee activities, and collaboration on manuscripts. Mentees described the relationship as “active” if the mentor and mentee met at least quarterly. Furthermore, mentor-mentee pairs that met at least quarterly demonstrated greater academic productivity than pairings that met less frequently. Importantly, the YI mentorship program was not intended to replace mentorship that occurs within training programs or academic centers. Rather, it should complement such the local mentorship junior colleagues receive. These findings will help direct future oversight and guidance for this and other pediatric mentoring programs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Research Funding: Children’s Oncology Group

References

1. Chesney RW, Dungy CI, Gillman MW, Rivara FP, Schonfeld DJ, Takayama JI. Promoting education, mentorship, and support of pediatric research. American Academy of Pediatrics Committee on Pediatric Research. PEDIATRICS. Jun; 2001 107(6):1447–1450. [PubMed: 11389274]
2. Ley TJ, Rosenberg LE. The physician-scientist career pipeline in 2005 : build it and they will come. JAMA. 2005; 294:1343–1351. [PubMed: 16174692]
3. Bixen CE, Papp KK, Hull AL, et al. Developing a mentorship program for clinical researchers. J Contin Educ Health Prof. 2007; 27(2):86–93. [PubMed: 17576629]
4. Shaywitz D, Martin J, Ausiello D. Patient-oriented research: principles and new approaches to training. Am J Med. 2000; 109:136–140. [PubMed: 10967155]
5. Jackson VA, Palepu A, Szalacha, et al. Having the right chemistry : A qualitative study of mentoring in academic medicine. Acad Med. 2003; 78:328–334. [PubMed: 12634219]
6. Straus SE, Chatur F, Taylor M. Issues in the Mentor-Mentee Relationship in academic medicine : a qualitative study. Acad Med. 2009; 84:135–139. [PubMed: 19116493]
7. Berk RA, Berg J, Mortimer R, et al. Measuring the effectiveness of faculty mentoring relationships. Acad Med. 2005; 80(1):66–71. [PubMed: 15618097]
8. Pololi LH, Knight SM, Dennis K, Frankel RM. Helping medical school faculty realize their dreams:an innovative, collaborative mentoring program. Acad Med. 2002; 77:377–384. [PubMed: 12010691]
9. Johnson MO, Subak LL, Brown JS, et al. An innovative program to train health sciences researchers to be effective clinical and translational research mentors. Acad Med. 2010; 85:484–489. [PubMed: 20182122]
10. Buddeberg-Fisher, b; Herta, KD. Formal mentoring programmes for medical students and doctors —a review of Medline literature. Med Teach. 2006; 28(3):248–257. [PubMed: 16753724]
11. Steiner J, Curtis P, Lanphear B, Vu K, Main D. Assessing the role of influential mentors in the research development of primary care fellows. Acad Med. 2004; 79:865–872. [PubMed: 15326013]
12. Palepu A, Friedman R, Barnett R, et al. Medical faculty with mentors are more satisfied. J Gen Intern Med. 1996; 11(4 suppl):107.
14. Taherian K, Shekarchian M. Mentoring for doctors. Do its benefits outweigh its disadvantages? Med Teacd. 2008:e95–e99.
15. Sambunjak D, Strauss SE, Marusic A. Mentoring in academic medicine a systematic review. JAMA. 2006; 296(9):1103–1115. [PubMed: 16954490]
16. Sambunjak D, Marusic A. Mentoring What's in a name. JAMA. 2009; 302(23):2591–2592. [PubMed: 20009061]
17. Deatrick JA, Given B. Creating a pipeline for tomorrow's nurse researchers. Res Nurs Health. 2011; 34(3):171–5. [PubMed: 21520145]
18. Turnbull B. Scholarship and mentoring: an essential partnership? Int J Nurs Pract. 2010; 16(6): 573–8. [PubMed: 21129109]
19. Underhill CM. The effectiveness of mentoring programs in corporate settings: a meta-analytical review of literature. J Voc Behav. 2006; 68:292–307.
20. Taylor CA, Taylor JC, Stoller JK. The Influence of Mentorship and Role Modeling on Developing Physician–Leaders: Views of Aspiring and Established Physician–Leaders. J Gen Intern Med. 2009 Oct; 24(10):1130–1134. [PubMed: 19711134]
21. Carey EC, Weissman DE. Understanding and Finding Mentorship: A Review for Junior Faculty. J Palliat Med. 2010 Nov; 13(11):1373–1379. [PubMed: 21091022]
22. Genuardi FJ, Zenni EA. Adolescent medicine faculty development needs. J Adolesc Health. 2001; 29:46–49. [PubMed: 11429305]
23. Caniano DA, Sonnino RE, Paolo AM. Keys to career satisfaction: insights from a survey of women pediatric surgeons. J Pediatr Surg. 2004; 39:984–990. [PubMed: 15185240]

24. Takagishi J, Dabrow S. Mentorship programs for faculty development in academic general pediatric divisions. Int J of Pediatr. 2011; 2011:538616. [PubMed: 22164177]

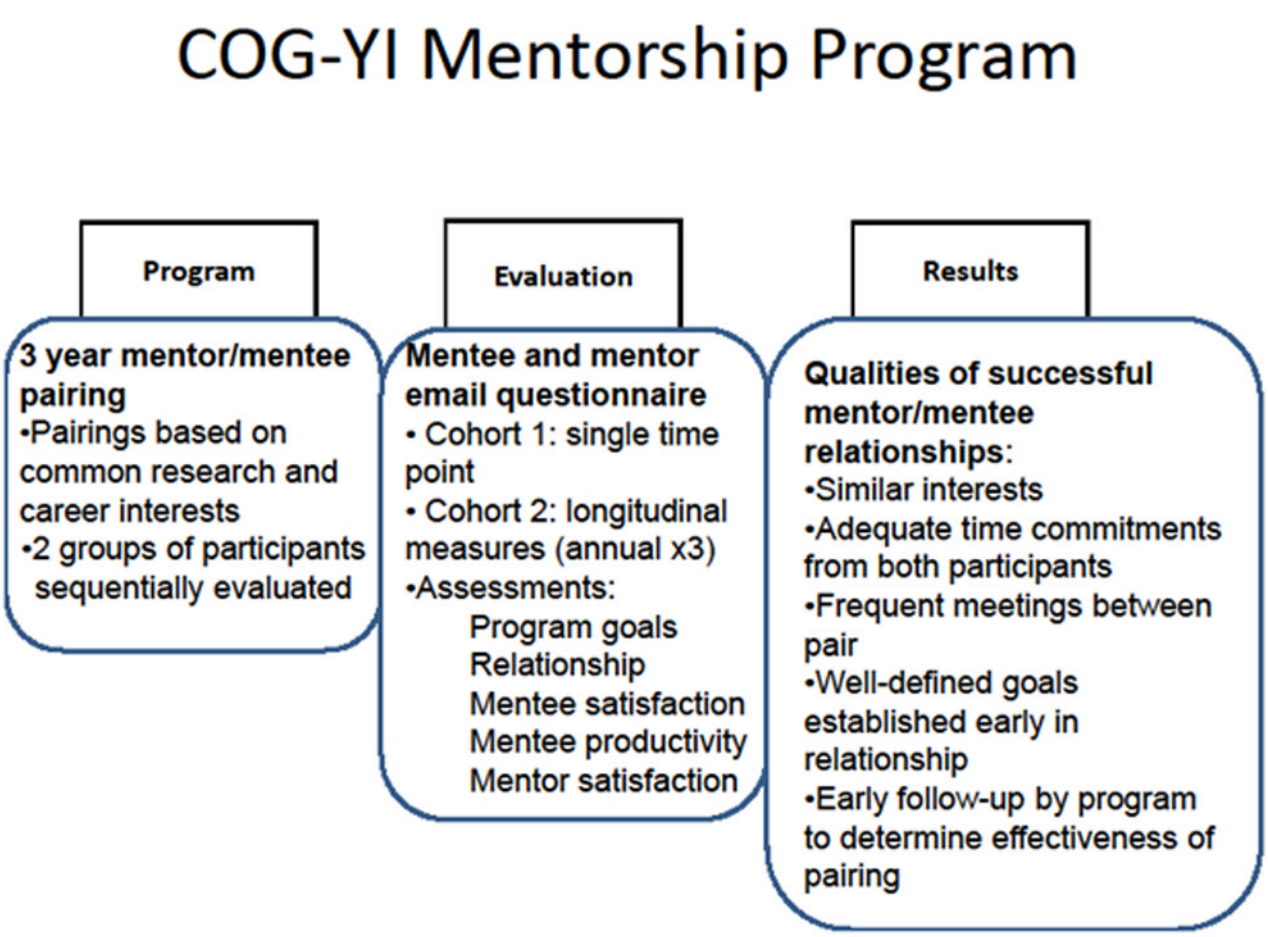

Figure 1.
Young Investigator Committee Mentorship Program Overview

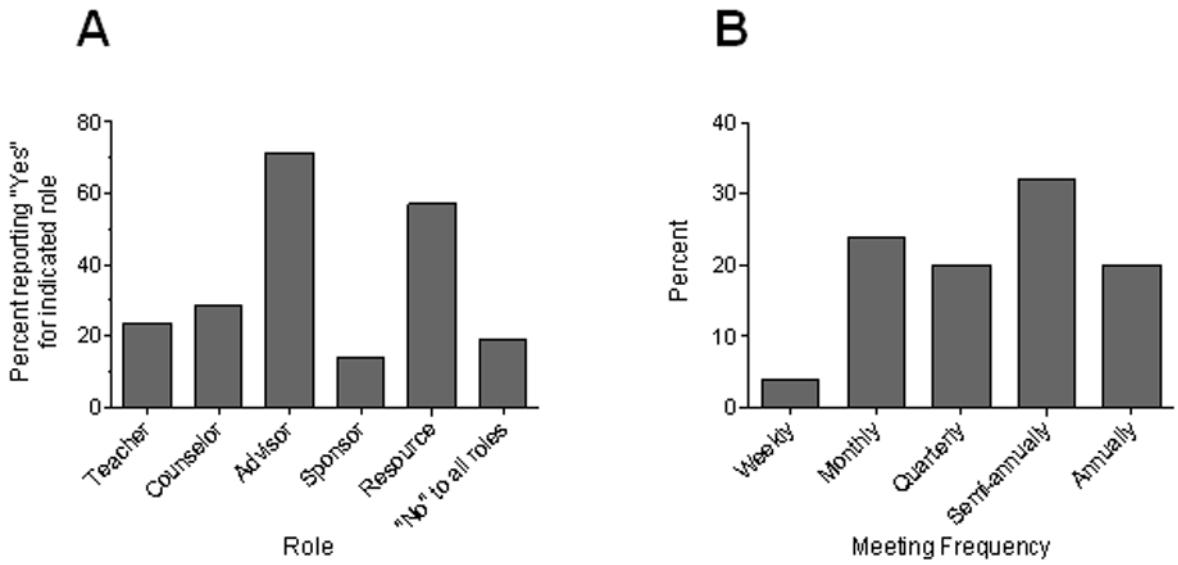

Figure 2.
(A) Roles served by mentors as reported by mentees. (B) Meeting frequency reported by mentees.

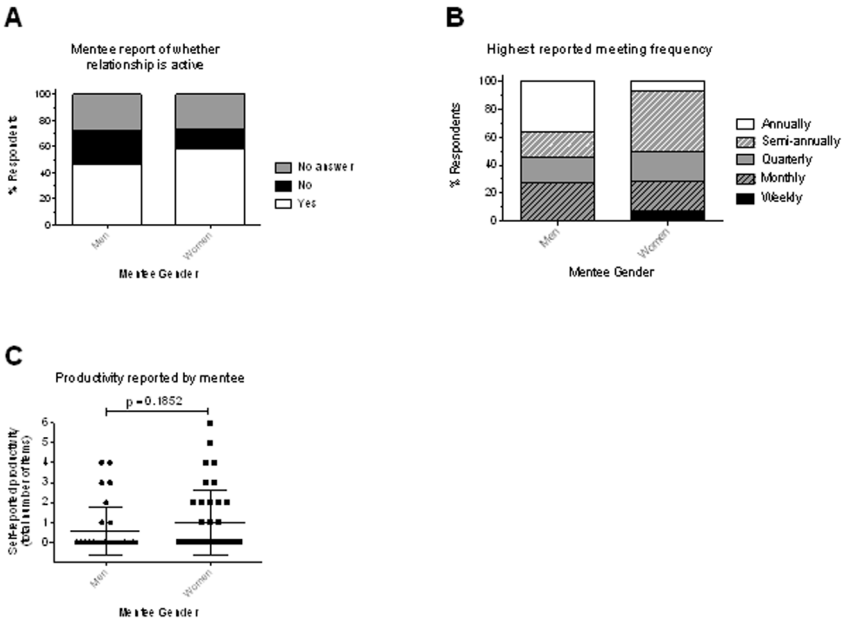

Figure 3.

(A) Relationship of gender to mentor-mentee interaction frequency. (B) Mentee gender and reported frequency of interactions. (C) Mentee gender and reported productivity.

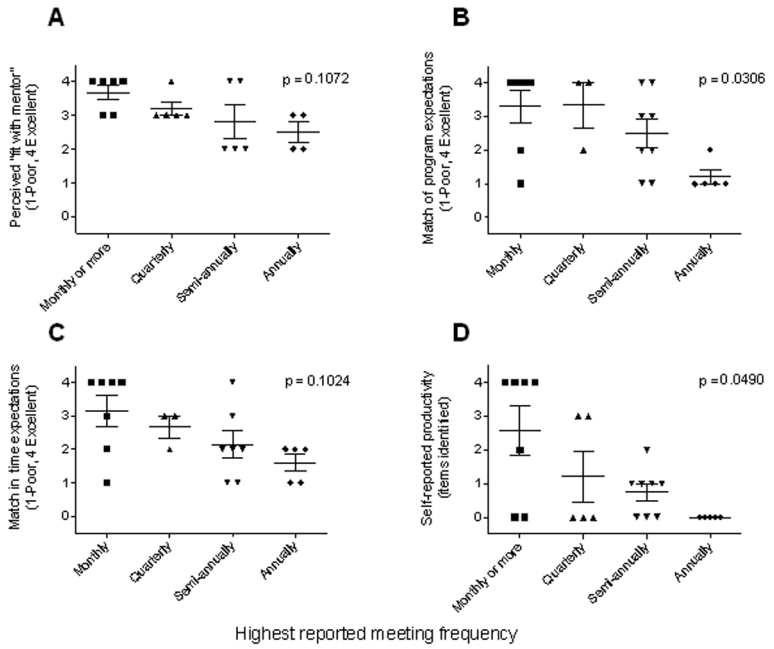

Figure 4.

Relationship of the frequency of mentor-mentee interactions with reported predictors and productivity outcome measures. p values shown are for Kruskal-Wallis analysis of the entire data set for each figure. Correlation of meeting frequency (and p values for Spearman nonparametric correlation) with A) the mentee's perceived degree of "fit" with their mentor ($p = 0.0094$), B) the mentee's perceived match of program expectations with the mentor's ($p = 0.0027$), C) the mentee's perceived match of time expectations with the mentor's ($p = 0.0092$), and D) the mentee's reported productivity ($p = 0.0059$).