

Influential Factors for Post-Fellowship Career Decision-Making: An NCCN Survey

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Abstract

Insight into factors important to fellows' decision-making about their career paths is critical to successfully developing program curricula, making capacity projections, and recruiting oncology physicians. This study was performed to determine the factors associated with post-fellowship career decision-making. Program evaluation surveys were administered to oncology fellows who attended the Fellows Recognition Program at the 2009 NCCN Annual Conference. A total of 125 (75%) fellows completed the initial survey. Overall, 73% of fellows reported participating in clinical research and 58% received formal training as part of their fellowship program. Receipt of formal training was correlated with greater program satisfaction ($r_s = 0.20$; $P = .03$), feeling more prepared for a post-fellowship career ($r_s = 0.30$; $P < .001$), and greater interest in clinical research post fellowship ($r_s = 0.32$; $P < .001$). Interest in post-fellowship clinical research ($r_s = 0.49$; $P < .001$) and importance of protected academic time ($r_s = 0.57$; $P < .001$) were strongly correlated with interest in practicing in an academic environment, whereas institutional reputation ($r_s = 0.18$; $P = .04$) and a multidisciplinary practice environment ($r_s = 0.22$; $P = .02$) were moderately associated with interest. Location, salary, multidisciplinary environment, and flexible scheduling were the most important controllable lifestyle (CL) factors. These results suggest that fellowship programs may be able to foster a desire to participate in research and subsequent interest in practicing in an academic institution through providing opportunities for formal training in clinical research skills. However, even in an academic setting, CL factors are important to attracting and retaining faculty. (*JNCCN* 2012;10:969–974)

The demand for oncology care will grow significantly in the next 10 years because of the increasing incidence of cancer and a growing survivor population, causing a shortage of oncologists.¹ Because of this physician shortage, oncology practices and institutions will compete for graduating oncology fellowship trainees. In addition, fellowship programs may be required to expand the number of oncologists trained for practice in the United States.

Understanding factors important to fellows' decision-making about their career paths is critical to successfully recruiting oncology physicians and planning program curricula and capacity projections. Insight into how fellows make career decisions may inform academic cancer centers, independent physician-led groups, or hospital-based groups as they seek to recruit graduating fellows into their faculty or practices.

The factors important to the physician career decision-making process are dynamic. In the past decade, medical students' priorities have shifted toward a greater emphasis on controllable lifestyle (CL) factors.^{2–4} In addition, program experiences and perceptions such as research experiences, mentorship, and receipt of formal research training are influential in determining specialty selection.^{3,5–9} Formal training may be defined by the Accreditation Council for Graduate Medical Education (ACGME) common program requirements, which generally include curricula that advance “knowledge of basic principles of research” and facilitate participation in scholarly activity.¹⁰

The primary objective of this project is to explore the key factors oncology fellows associate with an interest in clinical research and practicing in an academic institution post fellowship. Broadly, the experiences and perceptions of oncology fellows regarding their current fellowship program were explored, and more specifically, the importance of CL factors on choice of a desirable practice setting.

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Methods

As an evaluative component of the Fellows Recognition Program at the 2009 NCCN Annual Conference, we developed and administered a Web-based survey to oncology fellows who were selected to attend by their fellowship program directors. The NCCN Annual Conference is a forum for the dissemination of the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) to practicing clinicians. At the conference, previously published research relevant to clinical decision-making is discussed; however, novel research studies are not presented, and the emphasis is on clinical practice rather than academic research.

The Fellows Recognition Program is a didactic program designed to educate future oncology leaders on applying the NCCN Guidelines to patient care. All medical oncology fellowship programs and radiation oncology residency programs at NCI-designated cancer centers are invited to participate. Participation is voluntary, and fellows are provided full financial support to attend the conference.

Completion of the survey was independent of fellows' participation in the program. Each participant was advised that responses to survey questions would only be used in aggregate and any identifying information would be removed as much as possible. Interviewees were free to end the survey at any time.

We designed the survey to gauge program experiences and perceptions, and to assess factors associated with post-fellowship career decisions. We administered the survey via SurveyMonkey and kept it open for completion for 1 week prior to the 2009 NCCN Annual Conference.

We assessed fellowship program experiences using individual questions about receipt of formal instruction in terms of clinical research skills and/or current involvement in clinical research (Figure 1). Program perceptions that were assessed included preparedness for a career in academia, research, or practice based on their fellowship training and program satisfaction. Preparedness was assessed with a single question that asked fellows to rate their preparedness on a 4-point Likert scale. Program satisfaction was assessed with 4 questions, rated on a 4-point Likert scale, concerning level of satisfaction with 1) mentorship, 2) clinical responsibilities, 3) protected academic time, and 4) ability to conduct research. Individual ratings of program satisfaction

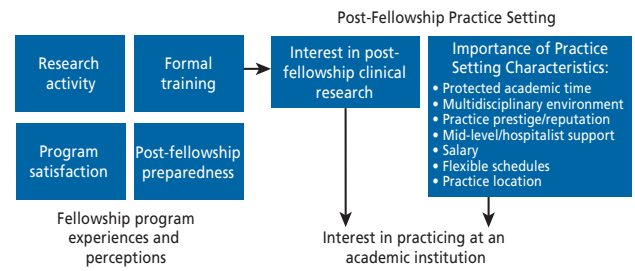


Figure 1 Hypothetical framework of factors associated with post-fellowship career decisions.

were highly colinear and were reduced to a single satisfaction score using factor analysis ($R^2 = 0.62$).

We used a hypothetical framework to illustrate factors associated with post-fellowship career decisions. These included interest in conducting clinical research post fellowship, interest in practicing in an academic setting post fellowship, and importance of practice-setting characteristics to career choice (Figure 1). Preference for practicing in an academic environment was assessed by asking fellows to rate their interest in practicing in 4 environments post fellowship, including 1) NCI-designated cancer center, 2) non-NCI-designated academic cancer center, 3) community cancer center, and 4) group practice. Interest in each of the 4 settings was combined into a single measure of interest in an academic setting using factor analysis ($R^2 = 0.52$). Interest in clinical research and importance of practice setting characteristics were assessed using single questions where fellows rated their perceptions on 4-point Likert scales.

We conducted all analyses using SAS v9.1. Spearman's nonparametric correlation (r_s) was used to assess the association between variables. All P values were 2-sided and an alpha of .05 was considered statistically significant.

Results

A total of 166 fellows participated in the NCCN 2009 fellows program, with 125 (75% response rate) fellows from 73 unique institutions completing the survey. This includes 82 hematologic oncology fellows from 56 institutions, 19 medical oncology fellows from 11 institutions, 23 radiation oncology fellows from 14 institutions, and 1 surgical oncology fellow. Compared with data from the ACGME, our sample contains a similar age range (mean, 32.3) but greater proportion of men (66%) compared with the overall gender distribution

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(56% male) for oncology data during the same academic year. Demographics of responders are listed in Table 1.

Overall, 82% of fellows reported participating in clinical research; however, only 58% reported receiving formal research training (Table 2). With regard to program perceptions, 21% ($n = 26$) reported being very satisfied with all 4 aspects of their program, including 1) mentorship, 2) clinical responsibilities, 3) protected time, and 4) ability to conduct research; 10% ($n = 23$) of fellows reported being not satisfied with at least 1 of 4 program aspects. Overall, 33 (26%) fellows reported feeling very prepared to enter academics, research, or practice after fellowship.

Most fellows reported feeling very (54%; $n = 67$) or somewhat interested (33%; $n = 41$) in conducting clinical research post fellowship. When interest in practice settings post fellowship was examined, 46% ($n = 58$) and 41% ($n = 51$) reported being very interested in practicing in an NCI-designated cancer center or non-NCI-designated academic cancer center, respectively. Fewer reported being very interested in practicing in a group practice (36%; $n = 45$) or community cancer center (30%; $n = 30$).

Most fellows reported that both location (69%) and having a multidisciplinary environment (61%) were very important characteristics of a practice setting when making career choices (Figure 2). Approximately half reported that salary and flexible schedules were very important practice-setting characteristics. Conversely, a quarter reported that protected academic time, institutional reputation or prestige, and support from mid-level providers or hospitalists were either neutral or not important institutional characteristics.

When the relationship between program experiences and perceptions was examined, receipt of formal research training was significantly associated with both greater program satisfaction ($r_s = 0.20$; $P = .03$; Figure 3) and feelings of preparedness post fellowship ($r_s = 0.30$; $P < .001$). Formal research training ($r_s = 0.32$) and involvement in clinical research ($r_s = 0.18$) were significantly associated with a greater reported interest in clinical research post fellowship (Figure 4).

Interest in clinical research post fellowship ($r_s = 0.49$) and protected academic time ($r_s = 0.57$) were strongly associated with a greater interest in practicing in an academic environment post fellowship (Figure 5). Importance of a multidisciplinary practice environ-

Table 1 NCCN Fellow Demographic Characteristics

Variable	N (%)
<i>Gender</i>	
Male	82 (66)
Female	43 (34)
<i>Age (y)</i>	
26–30	18 (14)
31–35	82 (66)
> 35	25 (20)
<i>Program Year</i>	
Not reported	1 (< 1)
1	18 (14)
2	46 (37)
3	53 (42)
4	7 (6)
<i>Specialty</i>	
Hematologic oncology	82 (66)
Radiation oncology	23 (18)
Medical oncology/solid tumors	19 (15)
Surgical oncology	1 (< 1)

ment ($r_s = 0.22$) and institutional reputation or prestige ($r_s = 0.18$) were less strongly associated with interest in practicing in an academic environment. Importance of other practice setting characteristics was not significantly associated with a greater interest in practicing in an academic environment.

Discussion

Perceptions and experiences of oncology fellows in their fellowship programs and their valuation of various practice-setting characteristics were correlated with an interest in conducting clinical research and practicing in an academic environment post fellowship. It was anticipated that fellows' experiences would predict program satisfaction and interest in clinical research post fellowship. As expected, greater interest in clinical research was correlated with greater interest in practicing in an academic institution. Independently, the importance of various practice-setting characteristics was correlated with fellows' interest in practicing in an academic institution.

Fellows who reported receipt of formal research training also reported greater program satisfaction,

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Table 2 Fellow Reported Fellowship Perceptions and Experiences, and Post-Fellowship Clinical Research Interests by Specialty

	Total N (col %)	Hematologic Oncology N (col %)	Radiation Oncology N (col %)	Medical Oncology/ Solid Tumors N (col %)	Surgical Oncology N (col %)
Participated in clinical research					
Yes	102 (82)	62 (76)	22 (96)	17 (89)	1 (100)
No	23 (18)	20 (24)	1 (4)	2 (10)	0 (-)
Received formal training					
Yes	73 (58)	46 (56)	15 (65)	12 (63)	0 (-)
No	52 (42)	36 (44)	8 (35)	7 (37)	1 (100)
Fellows prepared for post-fellowship career					
Very prepared	33 (41)	15 (18)	9 (39)	8 (42)	1 (100)
Somewhat prepared	64 (51)	49 (60)	7 (30)	8 (42)	0 (-)
Neutral	19 (15)	12 (15)	5 (22)	2 (10)	0 (-)
Not prepared	9 (7)	6 (7)	2 (9)	1 (5)	0 (-)
Interest in clinical research post fellowship					
Very interested	67 (54)	40 (49)	12 (52)	14 (74)	1 (100)
Somewhat interested	41 (33)	28 (34)	8 (35)	5 (26)	0 (-)
Neutral	12 (10)	10 (12)	2 (9)	0 (-)	0 (-)
Not Interested	5 (4)	4 (5)	1 (4)	0 (-)	0 (-)

Abbreviation: col, column.

feeling more prepared for their post-fellowship careers, and a greater interest in conducting clinical research post fellowship. The specific types of formal training received were not explored. However, this often includes the use of mentoring committees and specific courses designed to teach basic tools useful for clinical research. Further, fellows may have interpreted their receipt of formal training in different ways. For example, they may not have considered a

programmatic series of lectures in the same category as, for instance, the summer course in clinical research offered by ASCO and the American Association of Cancer Research. It should also be noted that these differences in interpretation may have impacted the association between receipt of formal training and feelings of preparedness or program satisfaction.

These results are consistent with previous work that found physicians who participated in formal MD-PhD programs and who published during medi-

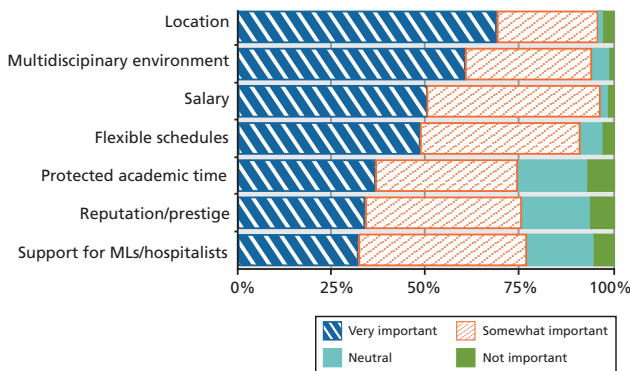


Figure 2 Fellows rating of importance of various benefits or qualities of a practice setting on career choices (n = 125). Abbreviation: ML, mid-level provider.



Figure 3 Spearman's correlation between program experiences^a and perceptions^b. The y axis denotes the Spearman's correlation coefficient between the 2 factors (n = 125). ^aReceipt of formal training or involvement in clinical research. ^bProgram satisfaction or post-fellowship preparedness.

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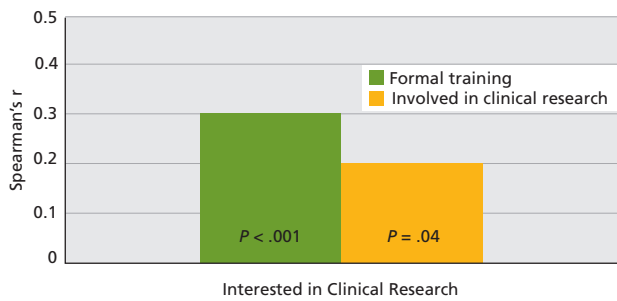


Figure 4 Spearman's correlation between program experiences^a and interest in conducting clinical research post fellowship. The y-axis denotes the Spearman's correlation coefficient between the 2 factors (n = 125).

^aReceipt of formal training or involvement in clinical research.

cal school or residency, were more likely to pursue careers in academic medicine.¹¹ In addition, in a survey of oncology fellows attending fellowship programs at NCI-designated cancer centers, Horn et al.⁹ observed similar results correlating publishing during fellowship and an interest in academic setting.

Compared with other practice-setting characteristics, interest in clinical research post fellowship and protected academic time were most strongly associated with interest in an academic setting. This is consistent with the observations by Cull et al.¹² who observed that among pediatric residents, one of the greatest barriers to conducting research was a lack of protected academic time.

These results suggest one strategy for retaining physicians in academic medicine post fellowship may be to foster their clinical research interests, specifically through formal mentoring programs and programs designed to integrate more formalized research training experiences than are currently delineated by the ACGME program requirements. Although great interest and expressed need exist for formal mentoring programs, a limited number of successful mentoring opportunities are available.¹³ Systematic reviews of the literature observed that the relationship between mentorship and pursuing a career in academic medicine is inconsistent.^{11,14} This likely reflects the divergence between specialties' requirement for fellowship after residency.

These results support the importance placed on CL factors for future practicing physicians.¹⁵ When lifestyle factors were correlated with desire to practice in an academic environment, the strongest association by far was observed with protected academic time. Practicing in a multidisciplinary environment

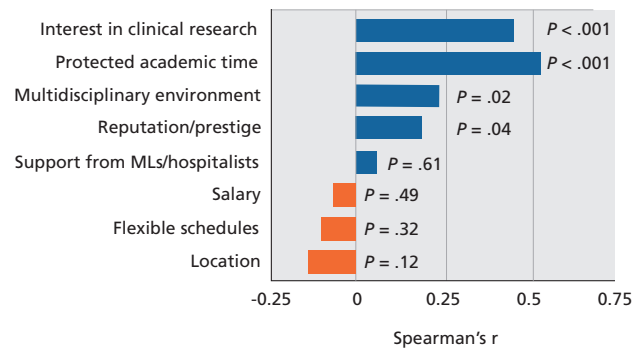


Figure 5 Spearman's correlations between interest in practicing in an academic environment and both interest in clinical research post fellowship and the importance of practice-setting qualities. Blue bars denote a positive association between factors. Orange bars denote a negative association (n = 125).

and institutional reputation correlated with a greater interest in practicing in an academic environment to a much lesser degree. Similar studies^{4,15} found that CL factors are important when selecting a specialty to pursue; however, no prior studies were identified that examined the influence of CL factors on career path once a specialty had been selected. Not surprisingly, the CL factors that were associated with a desire to practice in an academic environment are those that are most conducive to conducting research.

One potential limitation of the study is in the selective cohort of fellows invited to participate. The fellows who are selected to participate in the Fellows Recognition Program at the NCCN Annual Conference are chosen by their fellowship program for outstanding contributions to their programs and to the field of oncology. We presume there is not a strong selection bias toward fellows with an interest in post-fellowship academic research, because the emphasis of the NCCN Annual Conference is on clinical practice in oncology, and it is not an academic research conference. However, motivations for attending are unknown and may be related factors, such as networking with top clinical researchers.

Another important limitation to consider when interpreting these data is the cross-sectional study design. This limits the inferences that can be made about the causal relationship between factors that are correlated. For example, it may be that fellows who want to practice in an academic environment seek out formal training. In addition, fellows may have interpreted the concept of formal training differently, and this interpretation may vary by their in-

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terest in academic research. Lastly, a fellow's interest in practicing in an academic institution has not yet been shown to be predictive of the setting in which they will practice.

Future studies should incorporate prospective designs that document changes in interest in an academic environment before and after formal training, and experimental work evaluating training programs. In addition, longitudinal studies will be required to confirm the predictive validity of a reported desire to practice in an academic environment against a fellow's actual post-fellowship career decisions.

Conclusions

Currently, centers not only struggle to meet the increased demand for oncologists but also must cope with a declining interest in academic medicine.^{16–18} These data suggest that fellowship programs may be able to foster a desire for research and subsequent interest in practicing in an academic institution through implementing opportunities for formal training in clinical research skills. However, even among fellows interested in an academic setting, CL factors are important, and both recruiting and retaining oncologists may prove challenging if the academic institutions do not address these factors.

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