Retention of Junior Faculty in Academic Medicine at the University of California, San Diego

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Abstract

Purpose
To measure overall retention of junior faculty and evaluate the effects of a junior faculty development program on the retention of junior faculty at one institution.

Method
Quantitative survival analysis techniques were used to characterize retention of all new assistant professors hired at the University of California, San Diego (UCSD) School of Medicine for 18 years between July 1988 and December 2005, and the influence on retention of a junior faculty development program established in 1998. Data available included initial hire date, gender, ethnicity, participation in the faculty development program, and date of separation from UCSD. Actuarial Kaplan-Meier survival and Cox proportional hazard analyses were used to characterize retention and the influence of covariates up to the end of the probationary period, eight years after initial hire date.

Results
For the 839 new assistant professors, participation in the faculty development program and being hired after July 1997 had significant effects on retention. After adjusting for hire date, gender, and ethnicity, faculty participating in the faculty development program were 67% more likely to remain at UCSD at the end of their probationary period compared with nonparticipating faculty.

Conclusions
Faculty development programs for junior faculty in academic medicine can have positive effects on faculty retention and may facilitate success in academic medicine.

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The variety of daily professional responsibilities and job descriptions for faculty in academic medicine pose many challenges to career advancement for these faculty. Academic advancement may require excellence in clinical practice in addition to superior teaching, research, and service. Long periods of education and training, often with substantial associated debt, create personal and financial pressures that lure potentially successful faculty away from academic medicine. Many medical school faculty are expected to generate funds through clinical practice and/or research to support their own salary, adding uncertainty and professional pressures to a career in academic medicine. The complex organizational structure of an academic medical center only clouds the picture for many junior faculty. Challenges to navigating the waters of a career in academic medicine can lead to high faculty turnover. Data from the Association of American Medical Colleges (AAMC) indicate that 7.7% of men and 9.1% of women medical school faculty left their positions on an annual basis between 1995 and 1999.[1] Recent AAMC analyses of 10-year retention rates for faculty hired from 1981 to 1997 found that 43% of 4,279 first-time assistant professors remained at the medical school that hired them 10 years later.[2] It has been suggested that organized faculty development and mentoring programs have an important influence on faculty retention and, ultimately, career success in academic medicine.[3,4] However, there is little published research on faculty retention in academic medicine.

Established in 1968, the University of California, San Diego (UCSD) School of Medicine enjoys a reputation of excellence in both research and clinical service, despite its relatively young age as an academic institution. The vision that created this successful academic medical center and campus did not, in its early years, include an organized focus on professional development for junior faculty. In 1998, the Office of Women's Health of the U.S. Department of Health and Human Services selected UCSD as one of four National Centers of Leadership in Academic Medicine (NCLAM),[4] awarding the school two years of extramural funding to support junior faculty development. Establishing the UCSD NCLAM program required an institutional match for the first two years of extramural funding. During this initial phase, NCLAM leaders engaged senior faculty (UCSD's Leadership Council) to help with designing the program's curriculum and selecting junior faculty participants and their mentors. Program leaders also met individually with department chairs to solicit input on

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critical elements of the curriculum and to recommend individual faculty for participation in the program. Subsequently, NCLAM leaders demonstrated that the program was well received by the general faculty and was cost-effective.[5,6] As a result, the UCSD NCLAM program was institutionalized within the school of medicine in 2000, and the cost was absorbed by the dean's office.

The UCSD NCLAM program, described in more detail elsewhere, is an innovative professional development program committed to providing assistant professors with the knowledge, attitude, skills, and resources necessary to make the transition to successful careers in academic medicine.[5] It is a seven-month program comprising a curriculum-based series of professional development workshops, academic strategic career planning, individualized academic performance counseling sessions, a formal junior/senior mentoring relationship focused on a professional development contract, and community network building for both junior and senior faculty. Goals of the program are targeted both for the institution and for individual participants. For the UCSD School of Medicine, the goals are to provide a formal mentoring system for junior faculty, provide feedback to junior faculty about their academic progress in the University of California system, enhance the connection of junior faculty to the school of medicine, and increase the sense of community for both junior and senior faculty. Complementary goals for junior faculty are to develop skills appropriate to their career path, develop a personal academic strategic plan aligned to the requirements for success at the University of California, and expand a network of colleagues within the university.

NCLAM is open to any full-time assistant professor at UCSD School of Medicine who submits an application describing reasons for participating and goals. Each department chair is contacted to nominate specific eligible faculty, who are then encouraged to apply. After reviewing the applications, an advisory board of senior faculty select the NCLAM class, ensuring a representative balance of departments, MDs and PhDs, gender, ethnicity, and academic series. Junior faculty are encouraged to apply after at least one year on the faculty; preference is given to applicants at the mid-assistant professor level, as well as to applicants who reapply after being denied selection in previous years. The most recent NCLAM class in 2007–2008 included 18 members selected from a total of 29 applicants.

The NCLAM program requires a commitment from each junior faculty to participate fully in the program. This includes attendance at weekly half-day workshops, completion of an individual professional development contract, and regular meetings with a senior mentor focused on completion of the contract. In return for the time dedicated to NCLAM, each participant's department is compensated at the rate of 5% of base salary during the program.

Evaluating success of a faculty development program like NCLAM is difficult because of the variety of career paths for junior faculty and the absence of defined measures of success, both for individual faculty and for the institution. One important goal of such programs is to facilitate retention of promising junior faculty. With these facts in mind, the purpose of this analysis is to (1) characterize the retention of junior faculty at UCSD School of Medicine using quantitative survival analysis techniques, and (2) evaluate the effect of the NCLAM faculty development program on this retention.

Method

Available information for all new assistant professors hired at UCSD between July 1, 1988, and December 31, 2005, was collected and integrated into a single, uniform database noting data on initial hire date at UCSD School of Medicine, gender, ethnicity, participation in the NCLAM program, and date of separation from UCSD. Faculty in all five salaried professorial series at UCSD were included. Information about reasons for faculty separations was not available for all faculty and, therefore, not included in the analyses. Chi-square tests were used to compare NCLAM participants versus non-NCLAM participants with respect to gender and underrepresented minority group status.

Actuarial Kaplan-Meier survival curves were constructed to characterize survival from the initial hire date until date of separation or the end of the probationary period for assistant professors, eight years from the initial hire date. All faculty in the cohort remaining at UCSD on December 31, 2006, the last date for data analyses, were censored. Because of the relatively small number of faculty from specific underrepresented ethnic groups, all faculty self-designated as Hispanic, African American, and American Indian faculty were pooled into one group of underrepresented minorities. All others were coded as majority.

The univariate effects of gender, ethnicity, and participation in NCLAM were evaluated by Kaplan-Meier curves and compared with log-rank tests. The effect of hire date was evaluated by dividing faculty into four cohorts based on hire date as follows: (1) July 1988 to June 1993, (2) July 1993 to June 1997, (3) July 1997 to June 2001, and (4) July 2001 to December 2005. Kaplan-Meier curves were constructed for each cohort. Log-rank tests were used to compare the cohorts. In addition, hire date was analyzed as a dichotomous variable as hired before or after July 1997, to examine the temporal effects on faculty survival after the NCLAM program was established in 1998. These two cohorts were also evaluated by Kaplan-Meier curves and compared with a log-rank test.

Finally, univariate and multivariate analyses were performed using the Cox proportional hazard technique to evaluate the effects of gender, ethnicity, hire date, and participation in NCLAM on faculty retention at UCSD.

Results

Data were available on 839 new assistant professors hired at the UCSD School of Medicine between July 1988 and December 2005. During this period of time, UCSD School of Medicine experienced considerable growth of salaried faculty from 540 in 1990 to 850 in 2005 (a 57% increase). Since the NCLAM program was established in 1998, through 2005, 120 junior faculty participated in NCLAM in the first seven classes, representing 13 of the 14 departments in the school of medicine and all academic series. The 120 NCLAM participants included 85 MDs, 26 PhDs, and 9 with both degrees. In addition, 20 of 120 (17%) NCLAM participants were classified as underrepresented minorities (URMs), and 67 of 120 (56%) were women. Comparatively, 6% of the overall cohort of 839 new assistant professors were URMs, and 38% were women.

Table 1

Characteristics of 839 Junior Faculty Hired at University of California, San Diego School of Medicine From July 1988 to December 2005

Ethnicity	No. (%) of non-National Center for Leadership in Academic Medicine (NCLAM) participants	No. (%) of NCLAM participants*	Total no. (%)
Men			
Non-underrepresented minority (URM)	442	42	484
URM	25	11	36
Total	467	53	520 (62)
Women			
Non-URM	245	58	303
URM	7	9	16
Total	252	67	319 (38)
Non-URM	687	100	787 (94)
URM	32	20	52 (6)
Total	719 (86)	120 (14)	839

* NCLAM participants were significantly more likely to be women and URM members than non-NCLAM participants (chi-square, $P < .001$).

Table 1 presents descriptive information about the 839 junior faculty in the present analysis. Compared with non-NCLAM participants, there were significantly more women ($P < .001$) and URM ($P < .001$) faculty represented in NCLAM. The greater proportion of women and URM faculty in NCLAM may represent an emphasis in recruiting such applicants. In addition, specific restricted funding was available for URM participants.

Figure 1 presents the actuarial Kaplan-Meier survival curves for all junior faculty according to the four cohorts of hire date. Faculty hired before July 1997 (cohorts one and two) had significantly lower retention than those hired after July 1997 (cohort three; $P < .05$ by log-rank test). It seems that the survival curves of the four cohorts do not separate until after four years. Therefore, the most recent subgroup (cohort four) did not differ significantly from the other three, although after four years the curve of cohort four seems to track that of cohort three. This suggests that there were some significant temporal influences on faculty retention for new junior faculty hired after July 1997.

Figure 2 presents the actuarial Kaplan-Meier survival curves for all junior faculty according to whether or not they participated in the NCLAM program. Overall, retention of NCLAM participants was significantly greater than that of non-NCLAM participants ($P = .003$).

Results of the univariate and multivariate Cox proportional hazards analyses are presented in Table 2. Univariate analyses indicate that only participation in NCLAM (hazard ratio 1.77, $P = .004$) and hire date (months after January 1988, hazard ratio 1.03 per 12 months, $P = .02$) were significantly associated with increased faculty retention. There was no effect of gender or ethnicity on retention. When all four variables were included as covariates in a multivariate Cox proportional hazards model, only participation in NCLAM ($P = .01$) was independently associated with retention. Hire date was less statistically significant ($P = .12$) than participation in NCLAM, indicating some interdependence between these two covariates. In the multivariate model, faculty participating in NCLAM were 67% more likely to remain at UCSD at the end of their probationary period.

Discussion

The results of these analyses demonstrate that a faculty development program for junior medical school faculty can have a positive influence on faculty retention and, presumably, on career success in academic medicine. They also demonstrate that techniques of survival analysis can be used effectively to model faculty retention over time. We emphasize that these analyses of retention of new junior faculty hired at the UCSD School of Medicine during the past 18 years were limited by the availability of consistent data for all faculty in the cohort. During most of this time period, there was no uniform, centralized faculty personnel database with information about hire and separation dates. Much of

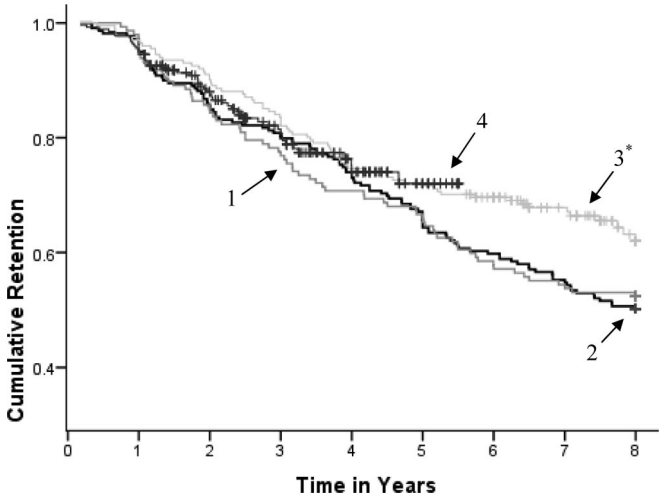

Figure 1 Kaplan-Meier survival analysis for retention through 2006 of junior faculty at the University of California, San Diego School of Medicine based on cohorts of faculty hired from (1) July 1988 to June 1993, (2) July 1993 to June 1997, (3) July 1997 to June 2001, and (4) July 2001 to December 2005. All remaining faculty were censored at the end of the eight-year probationary period for assistant professors.

* Cohort three was significantly different from cohorts one and two by log-rank test ($P < .05$).

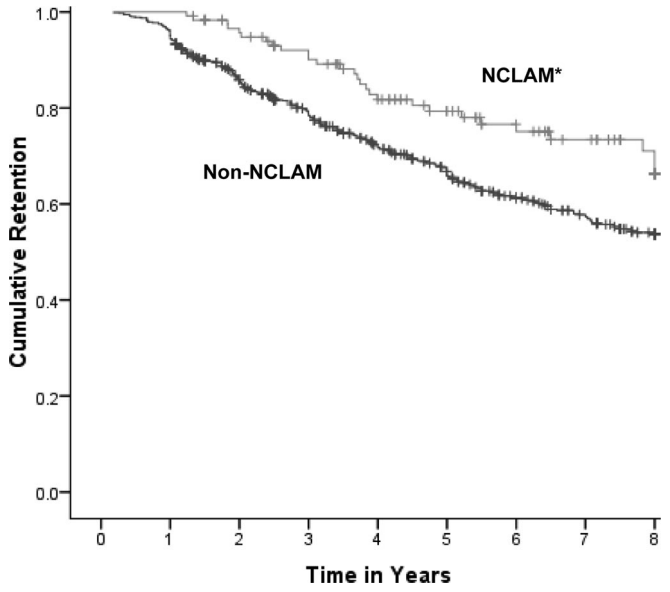

Figure 2 Kaplan-Meier survival analysis for retention through 2006 of new junior faculty hired at the University of California, San Diego School of Medicine based on participation in the National Center for Leadership in Academic Medicine (NCLAM) faculty development program. All remaining faculty were censored at the end of the eight-year probationary period for assistant professors. * $P = .004$ by log-rank test.

the data, particularly in the earlier years, were collected from separate annual data files for hired and separated faculty that were maintained in the academic affairs office. In many cases, review of actual paper files was required to resolve questions related to variations of name entry, duplicate names, name changes, errors in designation of academic series, salaried/nonsalaried status, gender, or ethnicity.

The increase in retention for junior faculty hired after July 1997 (Figure 1) is interesting and coincident with development of the NCLAM faculty development program. This does seem to be a critical time period in the natural history of faculty retention at UCSD, because the retention curves for the two cohorts before this date were similar to each other, as were the retention curves for the two cohorts after July 1997. This may suggest that NCLAM was, at least in part, responsible for a positive change in faculty retention, although many other variables not examined in this study may also have contributed.

Also, of note, the retention of new junior faculty at UCSD who participated in the NCLAM faculty development program was significantly higher than for non-NCLAM participants (Figure 2) and higher than the AAMC data on 10-year retention for all U.S. medical schools (43% for first-time assistant professors remaining at the same medical school).[2]

Used in this way as an indicator of faculty retention, survival analysis assumes that, from an institutional perspective, retention of faculty is a positive outcome, and faculty leaving is a negative outcome. However, faculty leave for a variety of reasons that may represent a spectrum of individual success in academic medicine. For example, medical school faculty who are unsuccessful in academic medicine may leave for nonacademic careers in industry or clinical practice. They may change job descriptions and remain on the volunteer faculty and participate in clinical teaching programs. Alternatively, successful faculty may leave when recruited to other academic institutions for a variety of reasons, including academic and career advancement, financial resources, or family and personal reasons. Although the former may be considered failures and the latter successes for academic institutions, all might be considered successes for the individual. Successful faculty development programs may help some faculty decide to change career paths and leave earlier while helping others identify better academic opportunities earlier.[7] These outcomes may be considered positive for the individual (better job satisfaction) and for the institution (more satisfied faculty), yet both will be considered failures in the retention of faculty on the basis of traditional survival analysis.

To define "success" in academic medicine for assistant professors consistently, we censored all faculty at eight years after their initial hire date, the maximum time allowed at UCSD as a probationary period for assistant professors to be promoted to the associate professor rank. Because there was no consistent information available about reasons for leaving UCSD, we felt that censoring at eight years provided the best definition of "survival" as success in academic medicine for junior faculty. In general, successful junior faculty do not leave the institution of their first faculty appointment before being promoted. In

Table 2

Results of Univariate and Multivariate Cox Proportional Hazards Analysis of Retention of 839 Junior Faculty Hired at the University of California, San Diego School of Medicine From July 1988 to December 2005, Based on Participation in National Center for Leadership in Academic Medicine (NCLAM) Program, Date of Hire, Gender, and Ethnicity

	Hazard ratio	95% CI	*P*
Univariate analyses			
NCLAM (yes/no)	1.77	1.20–2.61	.004
Date of hire (months after 7/88), per 12 months	1.03	1.01–1.06	.02
Gender (female/male)	1.10	0.87–1.40	.43
Ethnicity (Underrepresented minority [URM]/non-URM)	0.91	0.57–1.45	.70
Multivariate analyses			
NCLAM (yes/no)	1.67	1.11–2.50	.01
Date of hire (months after 7/88), per 12 months	1.02	1.00–1.05	.12
Gender (female/male)	1.02	0.80–1.30	.86
Ethnicity (URM/non-URM)	0.82	0.52–1.31	.41

our experience, assistant professors who leave during their probationary period do so for nonacademic positions. After promotion, however, it is not uncommon for successful faculty to be recruited to other academic institutions. Because the reasons for faculty separation are fundamentally different for faculty before and after promotion, we reasoned that it would be most appropriate in survival analysis to define success for assistant professors based on the maximum probationary period for promotion and to censor data after that time point.

It should also be emphasized that these analyses are the result of an observational, not experimental, study design and may be subject to selection bias for the faculty development program. Interested faculty are asked to submit a relatively simple application, but not all faculty who apply can be accepted, because the NCLAM program at UCSD has limited resources. In addition, many faculty do not apply for a variety of reasons, including lack of knowledge about the program, lack of interest, unavailability, or inability or unwillingness to commit the time required. Therefore, although the results indicate a significant effect of the NCLAM program on retention of junior faculty, it is possible that this beneficial effect may be attributable, at least in part, to the characteristics of junior faculty who choose to apply for and are selected for NCLAM, not just from the NCLAM program itself. For example, a higher proportion of women and URMs than is represented in the general population of new junior faculty applied for and were admitted to the NCLAM program. However, there was no significant effect of either gender or ethnicity on faculty retention. Given their historically poorer retention rates, the present results may represent a conservative estimate of the benefits of this faculty development program for these groups of faculty.[8] Given the limited information available for the present study, we were not able to evaluate other characteristics of the faculty in the analyses.

If, in fact, faculty development programs for junior faculty have a positive effect on faculty retention, then they may produce both academic and financial benefits for the institution.

All junior faculty hired in a medical school have committed substantial time and effort in education and training and are recognized as having the potential to succeed in an academic environment on the basis of demonstrated excellence in research, clinical practice, and/or teaching. Given the long training periods for such faculty—often 15 years or more of higher education and training for clinical scientists—the societal investment in these individuals is substantial. Recruiting these individuals as junior medical school faculty represents a significant level of institutional commitment and resources. Facilitating success for such faculty represents a positive return on that investment. Faculty who fail or leave the institution represent a negative return and drain scarce resources when replacements need to be recruited.

Recent publications examining the literature on faculty development and mentoring note that there are few good studies that rigorously evaluate the effect of these activities on career paths for medical school faculty and highlight the need for more work in this area.[9] In a previous publication, comparing faculty retention at UCSD during a four-year period after implementation of NCLAM with AAMC estimates of medical school faculty attrition, we demonstrated a positive return on investment (ROI) from NCLAM.[6] In addition to the economic ROI, successful faculty development programs may also provide a positive "academic" ROI (i.e., increased academic productivity and success). In summary, these results using statistical techniques of survival analysis for an 18-year period are consistent with our experience and demonstrate the positive effects of a formal, schoolwide faculty development program on faculty retention at the UCSD School of Medicine.

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