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# Determinants of Faculty Departure in an Academic Medical Center: A Time to Event Analysis



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Faculty retention is essential to maintain and enhance medical school and teaching hospital depth of expertise and advance institutional stature. An inclusive faculty is necessary to provide high-quality care to a diverse community of patients, ensure effective and relevant programs of education, and advance the research and scholarly mission of the institution.<sup>1-3</sup> In addition, replacement of faculty is expensive, estimated to cost up to \$1.3 million per faculty member lost.<sup>4,5</sup> It is therefore incumbent upon institutions to retain talent and provide a supportive environment for continued faculty career development. Despite this need, average attrition ranges from 25% to 30% at medical schools and teaching hospitals as current faculty seriously consider leaving the academic environment.<sup>6</sup>

Understanding factors that make faculty members vulnerable to departure is essential to ensure their retention.<sup>7-13</sup> With this understanding, faculty members at greatest risk for departure can be identified and early

efforts to ensure their retention can be instituted. Factors that promote faculty engagement and alignment with the institution can be elucidated and barriers to faculty career satisfaction and success can be more readily defined. An increasingly supportive and responsive environment can be constructed to retain talented and high-performing faculty members at medical schools and teaching hospitals.

We examined demographic characteristics of all faculty members who resigned from the faculty of The Ohio State University College of Medicine over a 6-year period. Time to event analysis was used to assess the relative hazard or risk of resigning based on faculty track, sex, ethnic background, and medical discipline. The analysis identifies faculty groups at greatest risk for leaving the academic environment and guides the necessary next generation of studies to identify specific factors contributing to this risk and the interventions that can effectively promote faculty retention.

## METHODS

### Study Sample

This investigation was approved by the Institutional Review Board of The Ohio State University. The study sample consisted of 533 members of The Ohio State University College of Medicine who resigned between January 2009 and December 2014. Survival or time to event analysis was performed with the date of initial

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faculty appointment to the date of resignation defining the time to event for each faculty member.

Faculty were categorized based on academic tracks consisting of the clinical track, tenure track, and associated or auxiliary track. For ease of analysis, faculty members were categorized as being in the department of internal medicine, a surgical department, or any other department. To simplify analysis of ethnic origin, faculty members were listed as Black, White, or Other (Hispanic, Asian, or undisclosed). Rank was not considered a variable in the analysis because higher rank would, in general, be expected to correlate with greater time to resignation.

**Statistical Analysis**

Kaplan-Meier survival function curves were generated to compare time to resignation stratified on the above variables. Significant differences in time to resignation between faculty strata were tested using the log-rank test after ensuring that the assumption of proportional hazards was met. Appropriate weighting methods were applied in the analysis if the assumption was not met.

Cox proportional hazards modeling was performed to identify which of the above variables was independently associated with the risk of leaving. A *P* value <.05 was considered significant. All analyses were performed using Stata version 12.1 (StataCorp LLC; College Station, Texas).

**RESULTS**

The distribution of the faculty who departed in the different categories is shown in **Table 1**. In general, these proportions paralleled the entire faculty over this time period.

**Comparison of Mean Time and Risk of Departure in the Different Faculty Categories**

The mean and standard error of time to resignation from the faculty since time of appointment for all faculty in

this analysis was  $4.7 \pm 0.17$  years. There was no significant difference in the mean time to resignation among medical, surgical, or other specialties (**Figure 1**).

The Kaplan-Meier survival function curves for different faculty tracks are shown in **Figure 2**.

Tenure track faculty had a significantly (*P* <.0001) longer time to resignation ( $6.8 \pm 0.4$  years) than clinical track ( $4.0 \pm 0.2$  years) or associated faculty ( $3.9 \pm 0.3$  years). The survival curves for associated and clinical faculty virtually overlapped, and there was little difference in the mean time to resignation between these faculty tracks.

The Kaplan-Meier survival curves stratified on faculty race or ethnicity are shown in **Figure 3**. Black faculty members were found to have the longest time to departure, with non-white/non-black faculty the shortest.

The difference between the survival functions for black and white faculty was not significant (*P* = .2).

**Sex.** The survival function curves for men and women faculty are shown in **Figure 4**. There was a significant (*P* = .003) difference in the survival functions for men and women, with men having a longer mean time to resignation ( $5.0 \pm 0.2$  years) than women ( $4.1 \pm 0.3$  years).

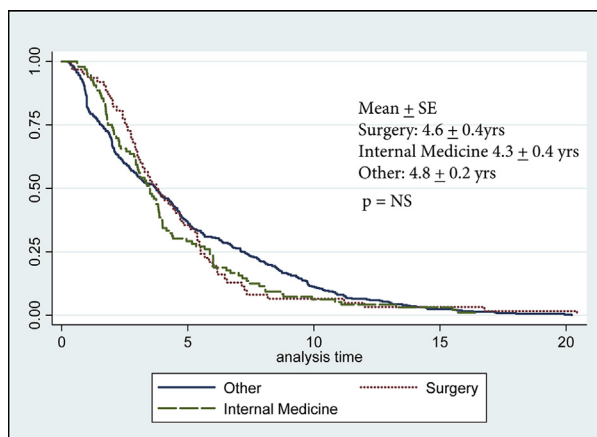
Differences in survival functions between men and women in the different academic tracks were tested. As shown in **Figure 5**, there was a significant difference in time to departure between men and women in the clinical track (*P* = .02), with the mean time to resignation for men being  $4.3 \pm 0.3$  years, and  $3.6 \pm 0.4$  years for women. There was not a significant difference (*P* = .3) in the survival functions in the tenure track (**Figure 6**) between men, who had a mean time to resignation of  $7.0 \pm 0.4$  years, compared with women, who had a mean time to resignation of  $6.3 \pm 0.6$  years.

**PERSPECTIVES VIEWPOINTS**

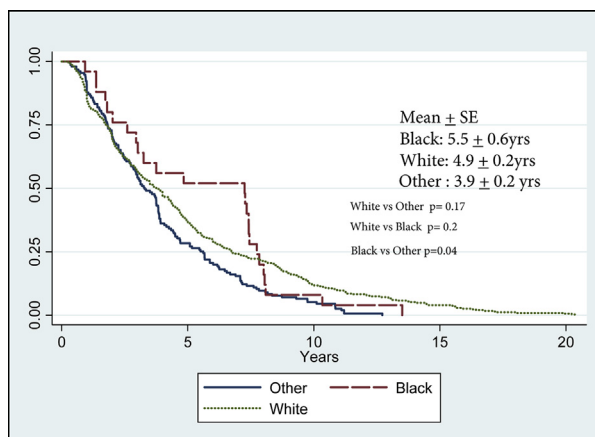
- Departure of faculty from academic health centers is costly financially and academically.
- Identifying those at risk for departure contributes to efforts for faculty retention.
- Faculty members who are women, in a nontenure clinical track, and not of white or black ethnicity, were found to be at highest risk for departing the Academic Health Center.
- Efforts to ensure support of faculty at high risk for departure may reduce costly faculty attrition.

**Table 1** Characteristics of the Study Sample

Sex	Race/Ethnicity	Rank	Track	Specialty
Women 37%	Black 5%	Assistant 78%	Associated 32%	Internal Medicine 18%
Men 63%	White 66%	Associate 15%	Clinical 44%	Surgery 12%
	Other 29%	Professor 7%	Tenure 24%	Other 70%



**Figure 1** Kaplan-Meier survival curves for faculty members in different practice specialties.



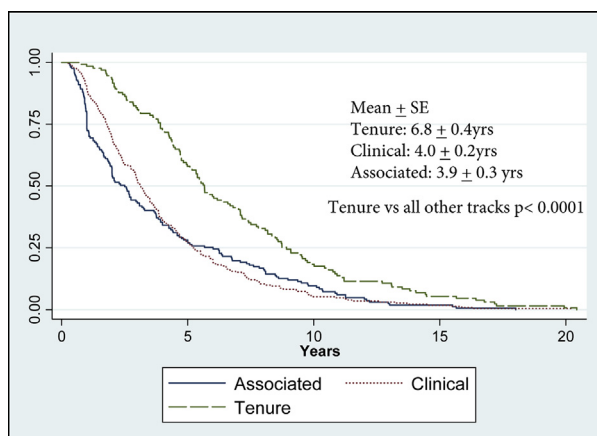
**Figure 3** Kaplan-Meier survival curves for faculty members of different race and ethnicity.

**Cox Proportional Hazards Modeling.** Cox proportional hazards modeling was performed to determine if the above faculty categories remained significant in multivariable modeling. **Table 2** shows the hazard ratios and significance of the individual faculty characteristics in univariable models. As expected, practice specialization was not significant in a univariable model. However, all of the remaining faculty characteristics had significant univariable hazard ratios. Forward selection modeling arrived at the final proportional hazards model shown in the bottom portion of **Table 2**. A significant increase in the hazard for departure was noted for women compared with men when adjusting for academic track and ethnicity. Both nontenure clinical faculty and auxiliary or associated faculty had a significant increased hazard for departure compared with tenure track faculty. In fact, the hazard for departure did not differ between clinical and auxiliary faculty. Both black and white faculty had a significantly lower hazard for departure compared with faculty of other race or ethnicity.

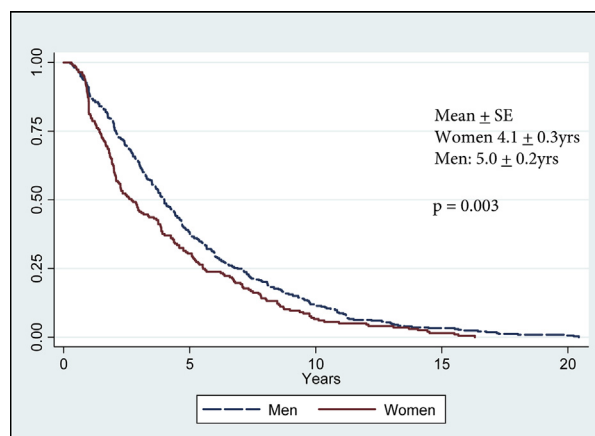
**DISCUSSION**

This retrospective analysis identifies factors associated with the risk of faculty departure from a large medical school. It applied a time to event analysis to those who have left the center over a 6-year period to determine not only the proportion of different faculty groups who depart, but to identify factors most closely associated with an increased “hazard” of leaving. Although some prior reports have prospectively tracked time to resignation of faculty cohorts, few have used time to event analysis to establish relative risk and mean departure times.<sup>13,14</sup> Examination of faculty attrition is one strategy to address faculty retention. The information provided in this report provides the basis for further studies of the causes for faculty departure and for efforts to retain those most vulnerable to leaving the academic environment.

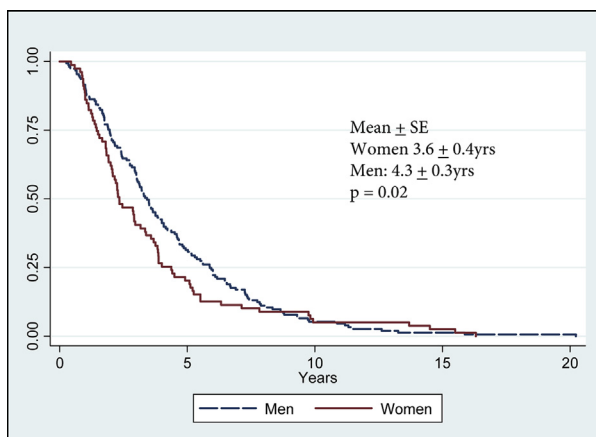
Faculty attrition is costly from academic, clinical, and financial perspectives.<sup>1,4,5,15</sup> The academic strength of an institution is tied to its diversity of expertise in research, education, and other scholarship. The loss of



**Figure 2** Kaplan-Meier survival curves for faculty members in different academic tracks.

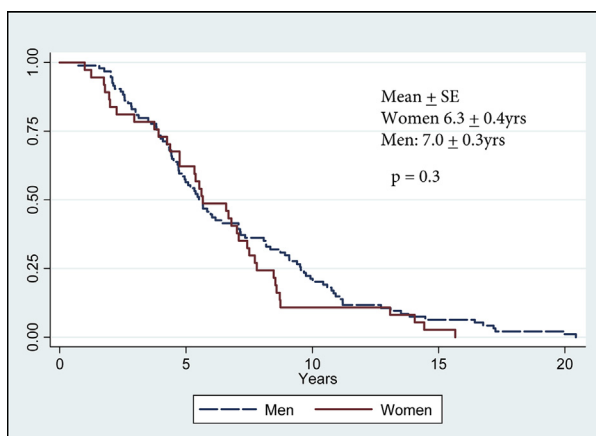


**Figure 4** Kaplan-Meier survival curves for men and women faculty members.



**Figure 5** Kaplan-Meier survival curves for men and women faculty members in the non-tenure clinical track.

faculty who contribute to this diversity can only weaken an institution. Inclusion of health care professionals from differing cultural and ethnic backgrounds is essential for an institution to be medically responsive to the entirety of the community it serves.<sup>1,2,15</sup> Faculty attrition imposes a great financial loss to the institution. One analysis estimated that replacing a generalist costs approximately \$120,000, a subspecialist \$290,000, and a surgeon \$590,000.<sup>4,5</sup> Another analysis concluded that replacement of medical staff represented a loss of over 5% of the entire institutional operating budget and the great proportion of these costs were attributed to physician attrition.<sup>5</sup> Finally, there are fewer tangible losses to the institution in the form of resources that have been devoted to faculty development, career guidance, advancing expertise, and gaining personal and career visibility through association with an academic institution. It is unfortunate when an institution does not benefit from its investment of these resources



**Figure 6** Kaplan-Meier survival curves for men and women faculty members in the tenure track.

through retention of an increasingly productive and successful faculty member.

### Relation of Faculty Characteristics and Risk of Departure

This analysis did not show significant differences in the hazard for departure among different medical specialties. There was a highly significant difference in the hazard for departure comparing tenure track faculty, nontenure clinical track faculty, and auxiliary or associated faculty. At The Ohio State University, the latter are those who are not “regular” faculty in that they are not required to have a commitment to the 3 university missions of education, service, and scholarship. It is concerning that the risk of departure for clinical track faculty, who in fact are “regular” faculty, does not differ from auxiliary faculty. There has been discussion that tenure is of limited value for physician faculty of medical schools given that it does not impart the traditional values of academic freedom and, in general, has little or no impact on faculty salary support.<sup>16</sup> Nevertheless, the significant increase in risk for departure for nontenure clinical, as opposed to tenure track, faculty suggests that there are elements associated with tenure that promote faculty retention. Tenure may imply a mutual commitment between the faculty member and the institution that does not exist for nontenure clinical faculty who serve impermanent terms requiring repeated reappointment. Such appointments may not be conducive to long-term commitment to the institution and may work against efforts for faculty retention.

There were significant differences in risk of departure for faculty of different ethnic and racial backgrounds. Interestingly, black faculty had the greatest mean time to departure and the time to event curve differed significantly from individuals who identified themselves as non-white/non-black. Much has been written regarding the importance of retaining black faculty members in academic medical centers.<sup>1-3</sup> Whether this longer time to departure reflects such efforts is not known. Non-white/non-black faculty members were found to have significantly higher risk of departure and appear to be a particularly vulnerable group. Data from the Association of American Medical Colleges using average time to departure for faculty characterized by race and ethnicity has not found large differences in the time to departure.<sup>17</sup> The differences in our findings may be related to a true time to event analysis that takes into account individual times to departure rather than overall group means.

Women as a whole departed the institution at a shorter mean time since appointment, and with a significantly higher hazard than men. Stratifying men and women by track shows that the most significant differences in the hazard and mean time to departure

**Table 2** Cox Proportional Hazard Models

	Hazard Ratio	Comparison Group	95% Confidence Interval	P-Value
Univariable Cox proportional hazard models				
Surgical	1.03	Non-Internal Medicine Non-Surgical	0.79-1.36	.8
Internal medicine	1.15	Non-Internal Medicine Non-Surgical	0.92-1.45	.21
Female	1.3	Men	1.09-1.56	.003
Clinical Track	1.68	Tenure Track	1.37-2.07	.0001
Auxiliary	1.68	Tenure Track	1.33-2.12	.0001
Black	0.56	"Other"	0.38-0.90	.013
White	1.00	"Other"	0.82-1.21	.97
Final Cox proportional hazards models				
Female	1.26	Men	1.05-1.51	.012
Clinical Track	1.70	Tenure Track	1.38-2.09	<.0001
Auxiliary	1.70	Tenure Track	1.34-2.09	<.0001
Black	0.60	"Other"	0.38-0.91	.016
White	0.70	"Other"	0.58-0.85	<.0001

existed for individuals in the clinical track. Women appointed in this track had a significantly greater hazard for leaving and a shorter mean time to departure from the institution. Only a trend to a difference was seen in the tenure track, which may be ascribed to the overall reduced hazard for departure for faculty who are tenured or tenure eligible. It has been recognized that although increasing numbers of women are joining the faculty of medical schools,<sup>18</sup> they advance in rank at a slower rate than men. It may be that this impediment to advancement is a factor discouraging women faculty from remaining in the academic environment.

The Cox proportional hazards model demonstrated that the faculty characteristics that were significant in univariable models retained significance in the final multivariable model. Sex, race/ethnicity, and academic track remained significantly associated with departure even when adjusting for other model variables.

### Implications

This analysis provides preliminary evidence regarding the characteristics of faculty members at greatest risk for leaving the academic environment and for whom targeted retention efforts should be considered. The results indicate combinations of factors that would identify faculty members that are particularly vulnerable. As an example, a woman of Asian background in a nontenure track may be at especially high risk for departure. The greatly increased risk for departure noted for nontenure track faculty perhaps motivates reconsideration of the current trend to reduce the number of tenure-eligible faculty or to reformulate the concept or process of tenure. These data motivate further investigations identifying the factors that promote faculty departures and the development of early preemptive strategies for

the retention of the faculty talent that is critical to the excellence of an academic institution.

### References

1. Betancourt JR. Eliminating racial and ethnic disparities in health care: what is the role of academic medicine? *Acad Med.* 2006;81(9):788-792.
2. Daley S, Wingard DL, Reznik V. Improving the retention of underrepresented minority faculty in academic medicine. *J Natl Med Assoc.* 2006;98(9):1435-1440.
3. Price EG, Gozu A, Kern DE, et al. The role of cultural diversity climate in recruitment, promotion, and retention of faculty in academic medicine. *J Gen Intern Med.* 2005;20(7):565-571.
4. Waldman JD, Kelly F, Arora S, Smith HL. The shocking cost of turnover in health care. *Health Care Manage Rev.* 2004;29(1):2-7.
5. Schloss EP, Flanagan DM, Culler CL, Wright AL. Some hidden costs of faculty turnover in clinical departments in one academic medical center. *Acad Med.* 2009;84(1):32-36.
6. Pololi LH, Krupat E, Civian JT, Ash AS, Brennan RT. Why are a quarter of faculty considering leaving academic medicine? A study of their perceptions of institutional culture and intentions to leave at 26 representative U.S. medical schools. *Acad Med.* 2012;87(7):859-869.
7. Bucklin BA, Valley M, Welch C, Tran ZV, Lowenstein SR. Predictors of early faculty attrition at one Academic Medical Center. *BMC Med Educ.* 2014;14:27.
8. Bunton SA, Corrice AM, Mallon WT. *Clinical Faculty Satisfaction with the Academic Medicine Workplace.* Washington, DC: Association of American Medical Colleges; 2010.
9. Cropsy KL, Masho SW, Shiang R, et al. Why do faculty leave? Reasons for attrition of women and minority faculty from a medical school: four-year results. *J Womens Health (Larchmt).* 2008;17(7):1111-1118.
10. Kelly AM, Cronin P, Dunnick NR. Junior faculty satisfaction in a large academic radiology department. *Acad Radiol.* 2007;14(4):445-454.
11. Lowenstein SR, Fernandez G, Crane LA. Medical school faculty discontent: prevalence and predictors of intent to leave academic careers. *BMC Med Educ.* 2007;7:37.
12. Satiani B, Williams TE, Brod H, Way DP, Ellison EC. A review of trends in attrition rates for surgical faculty: a case for a

- sustainable retention strategy to cope with demographic and economic realities. *J Am Coll Surg*. 2013;216(5):944-953, discussion: 953-954.
13. Speck RM, Sammel MD, Troxel AB, et al. Factors impacting the departure rates of female and male junior medical school faculty: evidence from a longitudinal analysis. *J Womens Health (Larchmt)*. 2012;21(10):1059-1065.
  14. Ries A, Wingard D, Gamst A, Larsen C, Farrell E, Reznik V. Measuring faculty retention and success in academic medicine. *Acad Med*. 2012;87(8):1046-1051.
  15. Alexander H, Lang J. The long-term retention and attrition of U.S. medical school faculty. *AAMC Anal Brief*. 2008; 8(4):9/15.
  16. Mann S. Redefining tenure at medical schools. *AAMC Reporter*. 2010. 9/15.
  17. Qi Liu C, Morrison E. U.S. medical school full-time faculty attrition. *AAMC Anal Brief*. 2014;14(2).
  18. Nonnemaker L. Women physicians in academic medicine: new insights from cohort studies. *N Engl J Med*. 2000;342(6): 399-405.