



Surgery Program Director Turnover Correlates With Residency Graduate Failure on American Board of Surgery Examinations in Civilian Residency Programs

Davis H. Payne, BSEd,* Daniel L. Dent, MD,[†] Mohammed J. Al Fayyadh, MD,[†] Jason W. Kempenich, MD,[†] Ross E. Willis, PhD,[†] Ronald M. Stewart, MD,[†] and John R. Potts III, MD[‡]

*Long School of Medicine, UT Health San Antonio, San Antonio, Texas; [†]Department of Surgery, UT Health San Antonio, San Antonio, Texas; and [‡]Surgical Accreditation, Accreditation Council for Graduate Medical Education, Chicago, Illinois

PURPOSE: The Review Committee for Surgery requires a minimum program director (PD) tenure of 6 years. The impact of PD turnover on the performance of program graduates is unknown. We hypothesize that (1) the majority of PDs step down before 6-year tenure and (2) higher PD turnover is associated with higher failure rate on American Board of Surgery (ABS) examinations.

METHODS: Start and stop dates of all surgery PDs between January 1, 2000 and December 31, 2017 were obtained for civilian surgery programs. A Kaplan-Meier curve of PD “survival” was constructed. Programs were divided into High Turnover (HT; ≥ 4 PD changes, $n = 33$) and Low Turnover (LT; ≤ 3 PD changes, $n = 191$) groups. Five-year (2013-2017) ABS pass rates were also obtained. Pass rates and compliance with current standards were compared between groups.

RESULTS: Kaplan-Meier analysis revealed that 40% of PDs do not comply with ACGME policy and serve < 6 years. HT programs had lower mean pass rates on ABS certifying exam than LT programs (76% vs 83%, $p < 0.01$), but not qualifying exam (88% vs 88%). HT programs are less likely to meet the current 65% pass rate standard (82% vs 93%, $p < 0.05$).

CONCLUSIONS: (1) An estimated 40% of general surgery PDs had tenures of < 6 years. (2) Greater PD turnover is associated with lower ABS pass rates among general surgery graduates. (J Surg Ed 76:e24–e29. ©

2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgical education, program director, resident education, surgery, ABS exam, graduate medical education

COMPETENCIES: Professionalism, Practice-Based Learning and Improvement, Systems-Based Practice

BACKGROUND

Surgical residency program directors (PDs) are the individuals with authority and accountability for the operation of their respective programs.¹ As such, PDs must meet a set of responsibilities listed in Section II of the ACGME Program Requirements for Graduate Medical Education in General Surgery. Among these responsibilities is the duty to “maintain continuity of leadership” through holding of the position for at least 6 years, which equates to the residency length plus an additional year.¹ This is a core requirement, meaning that it is deemed by the ACGME to be “essential to every graduate medical educational program.”¹ The ACGME reports on PD tenure by specialty each academic year in a published Data Resource Book. However, the percentage of the PD population failing to meet the required 6-year mark is not specifically noted in that publication.

Furthermore, there is little known about the effect of high degree of PD turnover on the quality of resident education. The only standardized outcome data currently available concerning graduate performance are the

Correspondence: Inquiries to Davis Payne, Long School of Medicine, UT Health San Antonio, 7703 Floyd Curl Drive, Mail Code 7740, San Antonio, TX 78229; e-mail: paynedh@livemail.uthscsa.edu

reported pass rates on American Board of Surgery (ABS) examinations, which include the qualifying exam (QE) and the certifying exam (CE).² The QE is a written, multiple-choice question exam that evaluates graduates' knowledge of surgical principles and applied science, whereas the CE is an oral exam designed to evaluate graduates' clinical skills and decision making.³ There have been various factors that have been shown to affect a program's graduates' pass rates on ABS examinations. These include the size of a program, a program's geographic location, whether or not a program is military, whether or not a program is independent, and the malpractice climate of the state in which the program is located.^{2,4} However, the effect of PD turnover has not been investigated.

Section V of the ACGME surgical program requirements states that a minimum of 65% of a program's residents must pass the QE and CE on the first attempt over the most-recent 5-year period.¹ However, there is a recently adopted change in ACGME requirements concerning this standard. As part of Section V of the Common Program Requirements going into effect July 1, 2019, surgical programs will be required to have QE and CE aggregate first-time pass rates higher than the bottom fifth percentile of programs. Any programs that achieve a minimum 80% first-time pass rate on both exams will be considered as having met the requirement, regardless of percentile rank.⁵ Regardless of the minimum board pass rate established by the program requirements, it is important for surgery departments to understand the programmatic implications of frequent program director turnover.

Our goal is to investigate the number of PDs who do not achieve tenure of 6 years and also to examine whether higher PD turnover in a program is associated with poor ABS examination results. We hypothesize that (1) the majority of PDs step down before 6-year tenure, and (2) higher PD turnover is associated with higher failure rate on ABS examinations.

MATERIALS AND METHODS

The start and stop dates of all surgery PDs since January 1, 2000 were obtained for general surgery programs in the United States. Nine that were classified as military programs were excluded because military PD turnover is influenced by substantially different factors than those seen in civilian programs. The PD data for the civilian programs were then organized and any transitions not present in the data were found using the program search function on the ACGME website to note recent changes up to the date of December 31, 2017.

A Kaplan-Meier (KM) analysis was performed for the PD time-in-rank data to accurately measure what percentage of PDs had remained in the role for at least

6 years. For the KM analysis, an event was considered to have occurred any time a PD left the position. The PDs with unknown start or end dates were statistically censored. The resulting table was used to construct a KM curve of "PD survival."

To assess whether PD turnover is changing over time, the percentage of PDs leaving the position with a term length of at least 6 years during the time periods of 2006 to 2011 and 2012 to 2017 were compared via chi-square analysis.

Data for the 5-year (2013-2017) pass rates of first-time examinees from surgical programs on the ABS QE, CE, and QE/CE combined index were obtained from a public dataset published by the ABS.⁶ Note that in calculating the QE/CE combined index, only performance on the QE is considered if the graduate has not yet taken the CE. Military programs were, again, removed from the data set.

Programs with 4 or more PD changes during the study period were defined as the High Turnover (HT) group. This definition was based on the fact that the most PD changes a program could sustain in 18 years while maintaining compliance are 3. Programs with 3 or fewer PD changes during the study period were defined as the Low Turnover (LT) group. Mean ABS first-time pass rates were compared between HT and LT programs using a 2-sample *t* test assuming for unequal variances.

The proportions of programs meeting the current standard of 65% on the ABS QE and CE exams were measured in both the HT and LT groups. The data were analyzed using a chi-square analysis.

RESULTS

The dataset originally contained 264 programs, with 9 of those being categorized as military programs. The remaining 255 civilian programs had a total of 836 PDs throughout the study period. A total of 19 PDs were excluded from any analysis since they left their positions due to loss of program accreditation. Of the remaining 817 PDs, there were 360 with a known term length (having defined start and stop dates) and 457 with an unknown or uncertain term length (lacking either a start or stop date). These groups were further broken down based on the 6-year threshold (Fig. 1).

The KM analysis revealed that 40% of PDs do not serve for at least 6 years, and therefore do not comply with the ACGME requirement (Fig. 2). The estimated median time-in-rank on the survival curve was 8 years. The shortest term length was measured at 19 days (0.05 years) and the longest term length at 25.8 years with that PD still in rank at the time of analysis.

There was no significant change in PD turnover between the 2006 to 2011 period and that of 2012 to 2017 (Table 1).

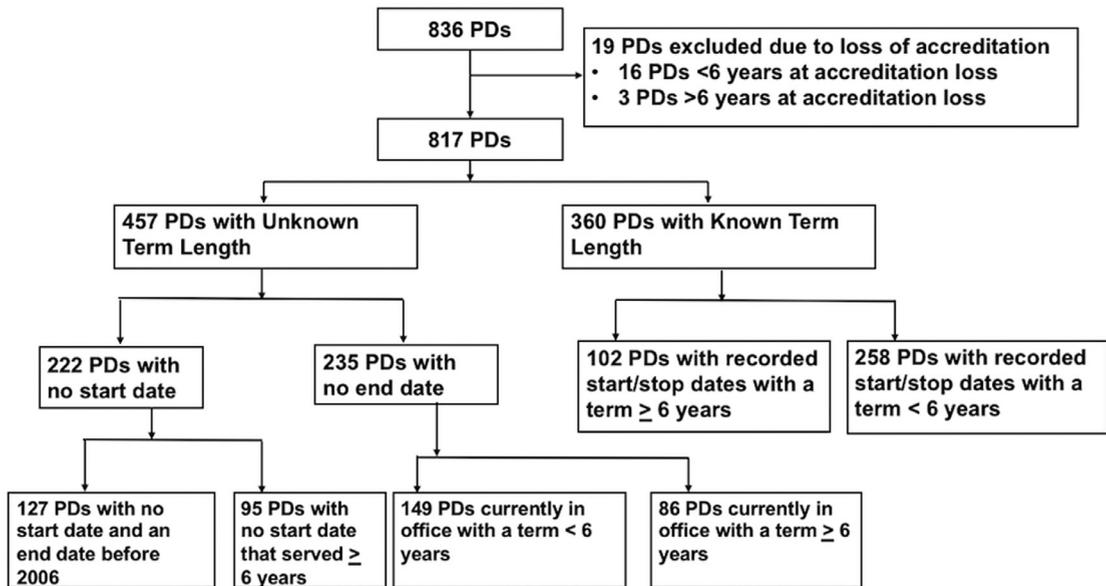


FIGURE 1. Consort diagram of PD tenure analysis.

There were ABS 5-year pass rate data available for 233 programs. After removing 9 military programs, 224 were left for analysis. Of these 224 programs, there were 33 HT (≥ 4 PD changes) programs and 191 LT (≤ 3 PD changes) programs.

There was no significant difference in mean pass rates on the ABS QE between HT and LT programs (88% vs 88%). However, HT programs had significantly lower mean pass rates on the ABS CE (76% vs 83%) and QE/CE combined index (69% vs 75%) compared to LT programs (Table 2).

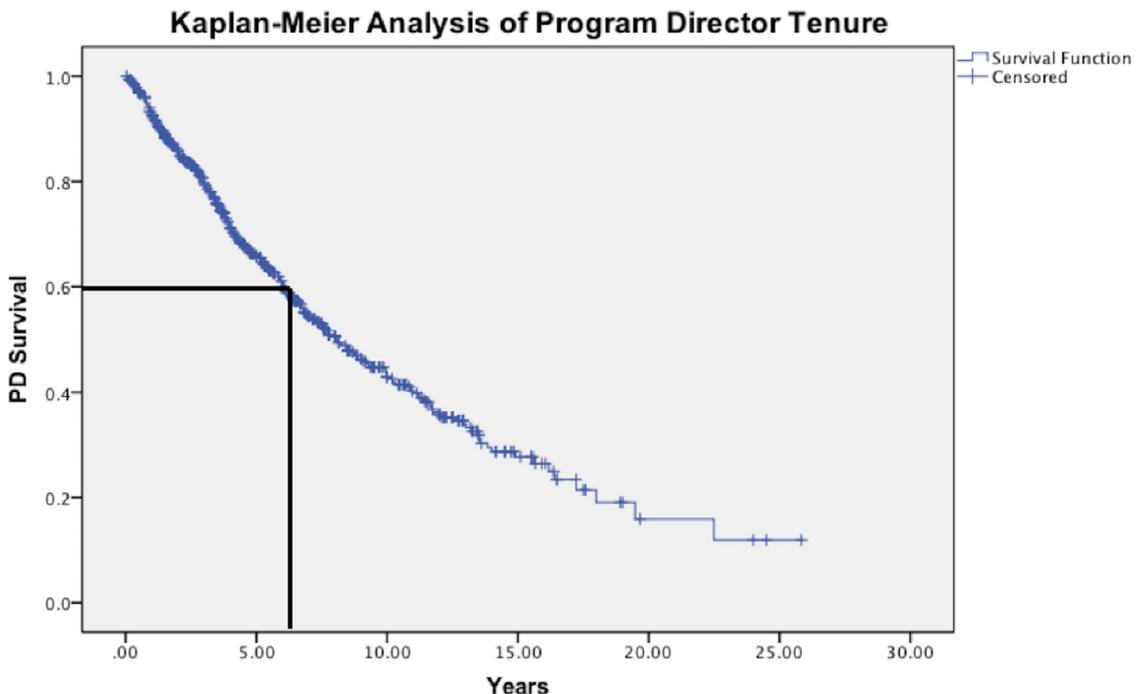


FIGURE 2. Kaplan-Meier curve of PD longevity.

TABLE 1. PD Turnover Over Time

	2006-2011	2012-2017
PD changes ≥6 years	205 96 (47%)	201 98 (49%)

TABLE 2. Comparison of Board Pass Rates Between HT and LT Programs

	Mean LT First Time Pass Rate (191 Programs)	Mean HT First Time Pass Rate (33 Programs)	p Value
QE	88%	88%	0.919
CE	83%	76%	<0.01
QE/CE	75%	69%	<0.05

Analysis of the proportions of programs in each group meeting the current ACGME minimum acceptable ABS pass rate standard revealed that 82% of HT programs met the standard, compared to 93% of LT programs ($p < 0.05$).

DISCUSSION

The results of this study disprove the first hypothesis and confirm the second. While the majority of PDs did meet the minimum tenure requirement, a correlation was demonstrated between high PD turnover and lower first-time pass rates on the ABS CE and significant differences were found between HT and LT programs in regards to the 65% standard.

In regards to the first hypothesis, 40% of the sampled PD population did not meet the minimum tenure requirement of 6 years. Although not the majority, a group this large failing to meet a core requirement of the ACGME guidelines is noteworthy. Since this is a failure to meet a core responsibility of the ACGME program requirements, all instances would potentially have been subject to citation. This is an important point as one of the most common citations reported by Residency Review Committees is “Program director responsibilities.”⁷ This is reinforced by the fact that citations concerning “Program director responsibilities” were noted to be among the top 3 citation categories by the Review Committee for Surgery in 2019.⁸ It should be noted that since the ACGME began reporting median PD tenure in the 2010 to 2011 Data Resource Book, the aggregate median of past PD tenure in surgery programs has never been >5.5 years. It is not the purpose of this study to determine why such a large portion of the general surgery PD population is not performing this responsibility, but there have been several studies

concerning PDs in various specialties investigating the rates of burnout and its possible sources.^{9,10} One of the main sources of burnout reported was “job-related stress, especially with administrative duties regarding compliance.”⁹ Speaking specifically about the administrative tasks of general surgery PDs, 1 study found that implementing guidelines was regarded as the most stressful administrative responsibility.¹¹ Anderson et al. also found that less-experienced general surgery PDs reported higher levels of burnout than those with more experience.

We also demonstrated a correlation between greater PD turnover and lower first-time pass rates on the ABS CE exam. However, such a correlation was not demonstrated concerning the QE exam. As the mean pass rates for these exams were 88% on the QE and 82% on the CE, high PD turnover only significantly correlates with performance on the CE. The CE is a complex exam assessing clinical reasoning and a graduate’s performance on the exam is influenced by many programmatic factors. The fact that there is a relationship with the CE and not with the QE may suggest that a high amount of PD turnover adversely affects the quality and/or quantity of resident educational experiences. The type of preparation for the CE undertaken by soon-to-be graduates, such as mock oral examinations, is an important consideration in this regard.¹² A program with a high amount of PD turnover may encounter more difficulty ensuring a broad clinical experience and/or organizing appropriate preparation sessions. PD longevity in an institution may correlate with that PD’s ability to ensure appropriate resident engagement during their clinical rotations. In the current era where multiple factors—such as concerns about malpractice risk and the drive to maximize clinical efficiency—have chipped away at resident engagement and autonomy, a seasoned PD may be better positioned to advocate for the residents in ways that maximize resident education and patient safety. Due to the nature of the CE, the active engagement of residents in clinical decision-making likely plays a large role in preparation for the exam as it is couched by some as “a discussion with a senior colleague about how to manage general surgical patients.”

Finally, this study found significant differences between proportions of HT and LT programs when it came to the meeting the 65% standard. Performance on ABS examinations is currently the only standardized feedback that PDs get on the performance of their graduates. Future studies may be able to explore additional measures of graduate performance relative to PD turnover and other factors.

This study also revealed that PD turnover did not increase over the course of two 6-year windows (2006-2011 and 2012-2017) in the study period. This finding is consistent with the ACGME Data Resource Books published in the last 6 years as both the mean and medians of past PD tenure have had little fluctuation.

Moving forward, this may become an important metric as it may reflect how well our specialty is doing in identifying, developing, and supporting the right individuals for the role. It may be worthwhile for the ACGME to incorporate these measures into program assessment.

This study has several limitations. Foremost, causation for the significant difference in HT and LT program first-time pass rates cannot be determined. There are many factors that have been shown to influence ABS first-time pass rates and this study does not investigate how large of an effect PD turnover has relative to these other factors. Because causation for the difference cannot be determined, it must be considered that in some cases, poor performance of graduates on ABS exams may lead to PD turnover, either through voluntary resignation or termination in response to the poor performance. Another limitation is that there are relatively few HT programs in proportion to LT programs. Furthermore, in regards to the portion of the PD population not meeting the 6-year mark, it is important to note that more than half of those PDs had to be statistically censored (meaning that these observations are only partially known) during KM analysis due to possessing unknown start or stop dates. This means that 276 (33.7%) of the 817 PDs could not be analyzed relative to the 6-year standard. Some PDs with an unknown start date may have served >6 years and some of those who are still in rank may ultimately persevere past the 6-year mark. This results in a less-reliable survival curve.¹³ However, with definitive data on 541 PDs relative to the ACGME standard expectation of a 6-year tenure, this represents the largest dataset ever analyzed among surgery PDs.

The strengths of this study mainly lie in the bulk of data being analyzed. Although the ACGME Data Books give insights into data by individual academic years using 10-year windows, there is no published analysis of surgical PD turnover data over an 18-year period. Furthermore, there is little research currently published on the impact of PD turnover when it comes to resident education and ABS first-time pass rates.

Possible future research regarding this subject should investigate the impact of PD turnover relative to other factors influencing first-time pass rates. The impact of PD turnover on resident recruitment could also be investigated. Additionally, as additional measures of graduate performance become available, their relationship to PD turnover can also be investigated.

CONCLUSIONS

(1) An estimated 40% of general surgery PDs had tenures of <6 years and (2) greater PD turnover is associated with lower ABS pass rates among general surgery graduates. While a direct causal relationship between PD

turnover and lower ABS pass rates cannot be determined, greater PD stability likely improves the quality of surgical education on multiple levels.

REFERENCES

1. ACGME Program Requirements for Graduate Medical Education in General Surgery. Available at: <http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/440GeneralSurgery2018.pdf>. Effective July, 1 2018. Accessed March 21, 2019.
2. Fuhrman GM, Orr R, Dunn E, et al. An assessment of university versus independent general surgery program graduate performance on the American Board of Surgery Examinations. *J Surg Educ*. 2007;64:346-350. <https://doi.org/10.1016/j.jsurg.2007.06.006>.
3. General Surgery – Training and Certification. Available at: http://www.absurgery.org/default.jsp?examoffered_gs. Accessed March 21, 2019.
4. Dent DL, Al Fayyadh MJ, Rawlings JA, et al. Failure on the American Board of Surgery examinations of general surgery residency graduates correlates positively with states' malpractice risk. *Am Surg*. 2018;84:398-402.
5. ACGME Common Program Requirements (Residency). Available at: <https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/CPResidency2019.pdf>. Accessed March 21, 2019.
6. General Surgery Residency Program Pass Rates – American Board of Surgery. Available at: https://www.absurgery.org/xfer/5yr_summary.pdf. Accessed March 21, 2019.
7. Lypson M, Simpson D. It all starts and ends with the program director. *J Grad Med Educ*. 2011;3:261-263. <https://doi.org/10.4300/JGME-03-02-33>.
8. Han D, Lamb DL. SES 009 - Review Committee for Surgery. 2019 ACGME Annual Educational Conference, Orlando, FL. Available at: https://www.acgme.org/Portals/0/PFAssets/Presentations/SurgeryRCUpdate_March2019_AEC.pdf?ver=2019-03-28-140707-287. Accessed August 12, 2019.
9. De Oliveira GS Jr, Almeida MD, Ahmad S, et al. Anesthesiology residency program director burnout. *J Clin Anesth*. 2011;23:176-182. <https://doi.org/10.1016/j.jclinane.2011.02.001>.
10. Hinchey KT, McDonald FS, Beasley BW. Sources of satisfaction: a second administration of the program director satisfaction survey. *Am J Med*.

2009;122:196–201. <https://doi.org/10.1016/j.amjmed.2008.10.022>.

11. Anderson KD, Mavis BE, Dean RE. Feeling the stress: perceptions of burnout among general surgery program directors. *Curr Surg*. 2000;57:46–50.
12. Kimbrough MK, Thrush CR, Smeds MR, et al. National landscape of general surgery mock oral

examination practices: survey of residency program directors. *J Surg Educ*. 2018;75:e54–e60. <https://doi.org/10.1016/j.jsurg.2018.07.012>.

13. Rich JT, Neely JG, Paniello RC, et al. A practical guide to understanding Kaplan-Meier curves. *Otolaryngol Head Neck Surg*. 2010;143:331–336. <https://doi.org/10.1016/j.otohns.2010.05.007>.