Residency and Fellowship Program Administrator Burnout: Measuring Its Magnitude

Alana M. Ewen, MPH
Mikhail C.S.S. Higgins, MD, MPH
Sandra Palma, BA
Kathryn Whitley, BA, C-TAGME
Jeffrey I. Schneider, MD

ABSTRACT

Background Little is known about the level of burnout among program administrators (PAs) working in graduate medical education.

Objective We created a national database with baseline burnout data for PAs from residency and fellowship programs, including intention to leave their current positions.

Methods A cross-sectional study was conducted in July 2017 to assess levels of burnout in a national cohort of PAs, who were largely members of online specialty forums. The Copenhagen Burnout Inventory (CBI) was used to measure burnout. Univariate analysis produced descriptive statistics for CBI. We performed a 2-sample *t* test to measure differences in average burnout scores for those who had thoughts of resigning from their positions and those who had not.

Results Of the approximately 10 205 national PAs, we sampled 1126 (11%). Of the 1126 individuals who received the study information, 931 (83%) completed the baseline survey. Total mean scores for all subscales were elevated (personal: 53.7, SD 21.4; work-related: 52.0, SD 22; and client-related: 30.6, SD 20.8; each scale ranged from 0, low, to 100, high). Burnout scores differed between those contemplating leaving their jobs and those who were not, across all subscales of CBI, including personal (64.2 versus 42.4, –24.18 to –19.44 confidence interval [CI]), work-related (63.5 versus 39.7, –26.12 to –21.35 CI), and client-related (36.6 versus 24.2, –14.95 to –9.84 CI; $P < .0001$ for all).

Conclusions In this national survey of PAs, burnout scores measured by the CBI were higher among those who had considered leaving their positions.

Introduction

The concept of burnout was first presented by Freudenberger[1] and later described by Maslach and Jackson[2] as a syndrome consisting of 3 elements: (1) emotional exhaustion, (2) cynicism/depersonalization (an emotional and mental separation from one's work), and (3) reduced personal accomplishment and feelings of ineffectiveness. This definition of burnout focused on individuals providing care for patients or underserved, distressed persons.[2] Burnout in clinicians has been linked to a reduction in work productivity,[3] poor sleep quality,[4] high turnover,[3] and an increase in alcohol consumption and drug misuse,[2,4] all factors that can negatively impact the work environment.

Survey studies have demonstrated high prevalence of burnout in US physicians and have found that burnout affects the quality of care.[5–7] The propensity for burnout to be contagious and affect other members of the health care team has also been shown.[8,9] Because they work directly with trainees and faculty, program administrators (PAs) function at the center of the graduate medical education community. To date, there has been no national study of the prevalence of burnout in PAs.

This study aimed to assess the degree of burnout and its association with consideration of leaving work among PAs from diverse US residency and fellowship programs.

Methods

Our study was open to all PAs, regardless of program accreditation status, experience level, specialty, or full-time/part-time employment status. Participants included individuals whose positions involved administration of a residency or fellowship training program. As the titles of these individuals vary across institutions, the term "program administrator" was used to describe program coordinators, residency managers, and graduate medical education fellowship coordinators, etc. Part-time and full-time statuses were based on the percentage of the participant's overall job responsibility that is exclusively dedicated to the role of a PA (part-time: ≤50%, full-time:

DOI: http://dx.doi.org/10.4300/JGME-D-18-00860.1

Editor's Note: The online version of this article contains details of the study participants' Copenhagen Burnout Inventory scores.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

>50%). To incentivize participation, participants external to our organization were entered into a raffle for a $100 gift card.

Solicitations were sent electronically over a 2-month period. Representatives from PA specialty associations (ie, Association of Family Medicine Administration, Association of Residency Administrators in Surgery, Coordinator Description Task Force) were contacted and asked to forward study details to their membership and specialty groups. Online PA forums, including the Association for Hospital Medical Education and LinkedIn groups, were also utilized to disseminate study information. Although the exact number of PAs nationally is unknown, it is estimated to be approximately 10 205 (Thalamus representative, written communication, April 19, 2019). Those who received the solicitation and wanted to participate were asked to e-mail the study team to be enrolled.

For this descriptive cross-sectional study, a baseline survey was distributed in July 2017 to all participants who e-mailed the study team. Survey design and setup prevented respondents from completing the survey more than once. Participation was voluntary and had no bearing on job standing. Our baseline survey included demographic questions, questions related to wellness activities, and the Copenhagen Burnout Inventory (CBI) tool.

The CBI, which has been shown to be highly correlated with the Maslach Burnout Inventory, was used to measure burnout in our study population.[10] The 19-item CBI questionnaire, originally developed to study burnout in Danish human service workers (non-health care and health care workers), consists of 3 independent scales: personal, work-related, and client-related burnout.[11] For this study, "client" was defined as an intern, resident, fellow, or medical student.

Participants were given 1 month to complete the self-administered baseline survey. Possible scores for each subscale of the tool ranged from 0 (low) to 100 (high), with higher scores reflecting higher levels of burnout.[11] Some studies have created cutoffs to define higher levels of burnout (ie, score $\geq$50 equates to high burnout), but these figures are arbitrary.[12,13]

Each component of the CBI is assessed independently, which allows researchers to better recognize the source of burnout—personal, work related, or client related.[11] Notably, the full Maslach Burnout Inventory questionnaires are not available for public use unless a payment is received—a barrier for many institutions. Kristensen and colleagues[11] found Cronbach's alpha for internal reliability of the CBI to be high: 0.85–0.87.

What was known and gap
Studies have demonstrated a high rate of burnout among physicians, but there is a lack of studies looking at the prevalence of burnout among residency and fellowship program administrators (PAs).

What is new
A national database with baseline burnout data for PAs was created.

Limitations
The total number of PAs working in the United States is unknown; response rate could not be established; and the Copenhagen Burnout Inventory, used to measure burnout, does not have validity evidence for this specific population.

Bottom line
Burnout among survey participants was high. Those who said they considered leaving their positions had the highest level of burnout.

Means and standard deviations were computed to ascertain personal, work-related, and client-related burnout scores across all specialties and geographic regions within our study group. A 2-sample *t* test was performed to test for differences in burnout scores among PAs in each specialty compared with the other studied specialties. In addition, we used a 1-way analysis of variance (unbalanced design) to test for differences in the burnout score means among geographic regions. The model adjusted for multiple comparisons using the Tukey method. Descriptive statistics for the 3 subscales of burnout, as well as all corresponding questions, were calculated using univariate analysis.

To better assess the impact of burnout on possible turnover, participants were asked, "In the last year, have you thought about resigning your position due to increased workload or work-related stressors?" We stratified by response option (yes or no) to examine how scores may relate to thoughts of resigning. We performed a 2-sample *t* test to measure the differences in average burnout scores between these 2 groups. The Cochran-Mantel-Haenszel test, computed to allow for stratification by confounding categorical variables, was used to identify any differences in the responses to additional questions between those who had thoughts of resigning and those who had not had thoughts of resigning. The model adjusted for age, gender, geographic location, and level of education. SAS 9.4 (SAS Institute Inc, Cary, NC) was used for all statistical analyses. Study data were collected and managed using the REDCap electronic data capture tool.[14]

The study protocol was deemed exempt by the Boston University Institutional Review Board.

Results

Of the 1084 individuals who e-mailed the study team, 904 (83%) completed the baseline survey. We

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

TABLE 1
Demographic Characteristics of Program Administrators (July 2017)

Characteristic	Study Participants (N = 931), No. (%)[a]
Age (y)	
18–24	4 (0.4)
25–34	183 (20)
35–44	229 (25)
45–54	251 (27)
55+	264 (28)
Gender	
Male	22 (2)
Female	905 (97)
Prefer not to say	3 (0.3)
Missing	1 (0.1)
Geographic region	
New England	149 (16)
Mideast	135 (15)
Great Lakes	175 (19)
Plains	83 (9)
Southeast	157 (17)
Southwest	94 (10)
Rocky Mountain	48 (5)
Far West	88 (10)
Off Shore	2 (0.2)
Ethnicity *(check all that apply)*	
Asian	17 (2)
Black or African American	84 (9)
Hispanic or Latino	62 (7)
Middle Eastern	3 (0.3)
Native American or Alaska Native	7 (1)
Native Hawaiian or Pacific Islander	4 (0.4)
White or Caucasian	747 (80)
Other	7 (1)
Prefer not to answer	21 (2)
Education	
High school graduate, diploma or the equivalent	46 (5)
Some college credit, no degree	194 (21)
Associate or technical degree	144 (16)
Bachelor's degree	374 (40)
Master's degree	166 (18)
Professional degree	6 (1)
None of the above	1 (0.1)
Length of employment in the medical education field (y)	
0–1	55 (6)
2–4	165 (18)
5–8	164 (18)
> 8	546 (59)
Length of time in current position (y)	
0–1	143 (15)
2–4	320 (34)
5–8	158 (17)
> 8	310 (33)

[a] Percentages may not sum to 100 due to rounding.

estimate that this represents 11% (1084 of 10 205) of all PAs. In addition, 29 of 42 (69%) PAs at our institution chose to participate. Two of the 933 respondents were not eligible to participate as none of their job responsibilities pertained to that of a PA, leaving 931 participants in the study group. The response rate was very high for all questions, with all or nearly all participants answering each question.

The majority of our study population was female (97%, 905 of 931) and self-identified as white or Caucasian (80%, 747 of 931). Participants came from various geographic areas' the highest percentage came from the Great Lakes region (19%, 175 of 931) followed by the Southeast (17%, 157 of 931). Nearly 60% (546 of 931) held at least a bachelor's degree and were employed in the medical education field for at least 8 years (TABLE 1).

TABLE 2 provides a detailed summary of CBI score by specialty. The neurology fellowship (n = 21) and obstetrics and gynecology PAs (n = 54) had the highest personal burnout scores, with CBI scores of 66.3 and 63.3, respectively. Gastroenterology PAs (n = 23) had an average score of 42.9 for personal burnout, the lowest among all specialties studied.

Neurology PAs (n = 37) demonstrated an elevated work-related burnout score (63) relative to the other specialties. Similar to findings in the literature,[11] client-related burnout scores were lower than scores for the other subscales. The otolaryngology PAs (n = 19) exceeded the overall client-related burnout mean, scoring a 42.5 on average. PAs from 3 specialties had a statistically significant different work-related burnout score than PAs working in other studied specialties (gastroenterology: 42.9 versus 52.7, $P = .035$; ophthalmology: 61.3 versus 52.3, $P = .010$; and radiology: 49.6 versus 52.6, $P = .018$). There was also a statistically significant difference in the average personal and client-related burnout scores across geographic regions (TABLE 3).

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

TABLE 2
National Copenhagen Burnout Inventory (CBI) Score by Specialty (July 2017)[a]

Specialty (Check All That Apply)	Participants[b] (N = 902)	CBI Score, Mean Score (SD)[c]		
		Personal Burnout	Work-Related Burnout	Client-Related Burnout
Anesthesiology	41 (4.6)	52.8 (19.9)	50.8 (22.4)	25.1 (18.3)
Cardiology	61 (6.8)	55.5 (21.2)	53.2 (22.2)	33.4 (19.3)
Child neurology	16 (1.8)	55.5 (26.1)	57.1 (24.4)	34.4 (22.5)
Dermatology	12 (1.3)	54.9 (16.6)	53.9 (16.0)	24.0 (16.7)
Emergency medicine	45 (5.0)	51.2 (23.6)	47.2 (22.4)	31.2 (21.6)
Endocrinology	16 (1.8)	51.8 (16.8)	50.2 (19.1)	25.0 (21.4)
Family medicine	67 (7.4)	58.2 (18.1)	57.4 (19.5)	35.6 (20.1)
Gastroenterology	23 (2.6)	42.9 (27.2)	42.9 (28.8)[d]	24.3 (19.2)
Geriatrics	20 (2.2)	52.5 (21.2)	53.6 (23.6)	25.2 (18.0)
Graduate medical education office	43 (4.8)	54.7 (21.5)	54.0 (23.3)	29.0 (20.4)
Hematology and/or medical oncology	23 (2.6)	50.2 (21.9)	49.4 (20.6)	31.2 (18.7)
Infectious disease	16 (1.8)	46.9 (24.2)	48.9 (27.8)	26.0 (26.0)
Internal medicine	88 (9.8)	57.6 (18.6)	54.8 (19.8)	31.2 (20.9)
Nephrology	23 (2.6)	48.9 (24.1)	45.2 (25.8)	22.5 (15.6)
Neurology	37 (4.1)	61.5 (21.5)	63.0 (18.6)	37.8 (20.0)
Neurology subspecialty fellowship	21 (2.3)	66.3 (21.7)	61.6 (19.9)	34.3 (19.5)
Neurological surgery	20 (2.2)	52.9 (22.8)	46.4 (21.7)	32.3 (22.1)
Obstetrics and gynecology	54 (6.0)	63.3 (24.2)	62.0 (23.0)	36.0 (22.0)
Ophthalmology	12 (1.3)	58.7 (12.6)[d]	61.3 (10.8)[c]	27.8 (18.3)
Orthopedic surgery	34 (3.8)	48.3 (22.1)	48.3 (23.9)	29.5 (19.0)
Otolaryngology	19 (2.1)	54.4 (23.1)	57.0 (26.7)	42.5 (19.2)
Pathology	22 (2.4)	43.6 (17.9)	42.4 (19.9)	22.9 (16.5)
Pediatrics	69 (7.7)	53.4 (23.2)	52.7 (23.7)	28.6 (19.8)
Pediatrics subspecialty fellowship	58 (6.4)	50.3 (21.7)	47.2 (22.7)	23.8 (20.9)
Physical medicine and rehabilitation	12 (1.3)	47.6 (21.1)	39.3 (22.0)	28.5 (18.4)
Psychiatry	26 (2.9)	52.1 (23.3)	47.8 (21.4)	29.7 (18.4)
Psychiatry subspecialty fellowship	17 (1.9)	54.9 (22.2)	48.9 (17.4)	29.4 (20.9)
Pulmonary	21 (2.3)	48.4 (23.2)	48.8 (23.8)	27.2 (23.3)
Radiation oncology	30 (3.3)	54.0 (18.9)	48.7 (18.3)	23.5 (18.1)
Radiology	48 (5.3)	50.6 (23.2)	49.6 (27.2)[c]	30.6 (25.1)[d]
Radiology subspecialty fellowship	17 (1.9)	47.8 (17.7)	45.4 (25.9)	26.0 (21.5)
Rheumatology	11 (1.2)	50.8 (23.0)	51.9 (26.0)	26.5 (20.2)
Surgery	66 (7.3)	51.1 (19.4)	49.4 (22.2)	29.4 (21.9)
Transitional year	15 (1.7)	53.1 (17.0)	44.0 (19.0)	28.6 (20.2)
Urology	18 (2.0)	49.1 (22.4)	48.2 (23.8)	39.1 (25.1)
Vascular surgery	27 (3.0)	48.5 (24.1)	48.0 (21.7)	33.3 (18.2)
Other	101 (11.2)	54.7 (21.2)	53.1 (21.7)	29.2 (19.5)

[a] To protect anonymity, local specialty data are not presented.
[b] Reported as No. and prevalence (%).
[c] Two-sample *t* test: difference in burnout scores among those who are administrators in the program and those who are not.
[d] Significant at the .05 level (2-tailed).

The online supplemental material offers additional insight into participant responses to all questions within the corresponding subscales of the CBI.

Nationally, 52% (483 of 931) of participants reported having thoughts of resigning from their positions due to increased workload or work-related stressors (TABLE 4). There was a difference in personal, work-related, and client-related burnout scores among those who had thought about resigning and those who had not contemplated resigning (TABLE 4).

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

TABLE 3
National Copenhagen Burnout Inventory (CBI) Score by Region (July 2017)[a]

Region	Participants[b] (N = 902)	Mean Score (SD)[c]		
		Personal Burnout[d]	Work-Related Burnout	Client-Related Burnout[d]
New England	120 (13.3)	51.8 (22.6)	50.1 (23.0)	27.1 (20.2)
Mideast	135 (15.0)	58.5 (22.1)	55.4 (23.2)	34.9 (23.0)
Great Lakes	175 (19.4)	54.4 (20.2)	54.1 (19.8)	32.0 (17.7)
Plains	83 (9.2)	46.5 (21.3)	48.5 (23.8)	27.9 (20.2)
Southeast	157 (17.4)	53.9 (19.9)	51.1 (21.7)	33.5 (21.4)
Southwest	94 (10.4)	55.8 (21.8)	52.5 (22.0)	27.6 (21.1)
Rocky Mountain	48 (5.3)	53.2 (19.2)	49.9 (19.8)	28.7 (18.9)
Far West	88 (9.8)	56.3 (22.7)	55.6 (21.8)	29.7 (22.1)
Off Shore	2 (0.2)	20.8 (23.6)	19.6 (27.8)	20.8 (29.5)

[a] To protect anonymity, local specialty data are not presented.
[b] Reported as No. and prevalence (%).
[c] One-way analysis of variance (unbalanced).
[d] $P < .05$.

After adjusting for age, gender, geographic location, and level of education, the association between having thoughts of resigning and the following 3 strata remained strong: (1) years working in the medical education field, (2) years in current position, and (3) wellness activities offered. Most respondents (91%, 704 of 777) expressed interest in attending wellness events organized by their institutions, if offered. Some respondents (14%, 124 of 902) noted that their institutions offered wellness activities specifically for PAs, which included annual retreats, workshops, counseling services, yoga/group activities, fitness challenges, and lunches.

Discussion

The results of this descriptive cross-sectional study demonstrated that PAs are also at risk for burnout, with variability across specialties and geographic areas. Results showed that PAs who had contemplated resigning their positions due to increased workload or work-related stressors had higher personal, work-related, and client-related burnout scores than those who had not thoughts of resigning.

Higher CBI scores were noted among those in neurology subspecialty fellowships (66.3), obstetrics and gynecology (63.3), neurology (61.5), ophthalmology (58.7), family medicine (58.2), internal medicine (57.6), and otolaryngology (54.4). The higher scores of the aforementioned fields greatly mirror those of their specialty physician counterparts, who were similarly identified as having high rates of burnout during our study period.[15–17] Physician data reflected that high rates of burnout were seen particularly among physicians in specialties at the front line of access to care, such as practitioners in internal medicine, family medicine, emergency medicine, and neurology.[15–17]

The level of burnout in this study group is consistent with findings of other studies that have utilized the CBI to examine clinician burnout.[11,18,19] It is clear from prior studies on resident burnout that PAs share common factors, including work overload and low support at work.[20] Physician data reflect that burnout is a major driver of physician turnover,[21–25] and that physicians' expression of intent to leave a place of employment is correlated with actual departures.[21,26,27] While the impact of PA departure is not as well studied, and its financial impact not as well understood, the hiring, onboarding, and training of a new PA is a significant burden for training programs, and it impacts trainees and faculty.

Participation in this study was voluntary, and as such, the study population represents a sample of PAs who may or may not be representative of the entire PA population, a cohort whose exact size is unknown. In academic year 2017–2018, there were more than 11 000 ACGME-accredited residency and fellowship programs,[28] but with varying magnitude and structure of administrative responsibilities within these programs, the number of programs is not synonymous with the number of PAs (a PA may oversee multiple programs at his or her institution). Similarly, there are no available data reflecting the number of nonaccredited training programs or the number of PAs who support them. In addition, the total number of active members across the specialty forums we utilized is unavailable.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

TABLE 4
Resigning and Burnout: Resignation Characteristics (N = 931) (July 2017)

Question	In the Last Year, Have You Thought About Resigning Your Position Due to Increased Workload or Work-Related Stressors?			
	Yes (52%), (n = 483)	No (48%), (n = 448)	*P* Value	95% Confidence Interval
Subscales[a]	Mean (SD)			
Personal burnout	64.2 (17.7)	42.4 (19.2)	< .0001[b]	(–24.18 to –19.44)
Work-related burnout	63.5 (17.7)	39.7 (19.4)	< .0001[b]	(–26.12 to –21.35)
Client-related burnout	36.6 (21.2)	24.2 (18.3)	< .0001[b]	(–14.95 to –9.84)
Study questions[c,d]	Reported as No. and prevalence (%)			
Years in the medical education field (n = 1 missing)			.011[e]	
0–1	14 (2.9)	41 (9.2)		
> 8	287 (59.5)	259 (57.8)		
Years in your current position			< .0001[e]	
0–1	49 (10.1)	94 (21.0)		
> 8	162 (33.5)	148 (33.0)		
Number of interns, residents, or fellows you support[f]			.29	
0–20	216 (24.0)	215 (23.8)		
21–40	145 (16.1)	109 (12.1)		
41–60	45 (5.0)	47 (5.2)		
61–80	20 (2.2)	19 (2.1)		
81+	48 (5.3)	36 (4.0)		
Not available	0 (0.0)	2 (0.2)		
Institution currently offers wellness or burnout activities for program administrators?[g]			.003[e]	
Yes	48 (5.3)	76 (8.4)		
No	426 (47.2)	352 (39.0)		
Participated:			.33	
Yes	37 (29.8)	53 (42.7)		
No	11 (8.9)	23 (18.6)		
Institution does not currently offer wellness or burnout activities, but I would be interested in attending[g]	390 (50.2)	314 (40.4)	.33	

[a] Two-sample *t* test.
[b] Significant at the .05 level (2-tailed).
[c] Cochran-Mantel-Haenszel test statistic.
[d] Adjusted for age, gender, location, and education.
[e] $P < .05$.
[f] To protect anonymity, local data were not collected.
[g] General wellness question asked and collected from national sample only (N = 902).

The findings from this study are limited by the difficulty in determining an accurate response rate given that the total number of PAs is unknown. Furthermore, it is unknown if this sample is representative of all PAs or if those with higher degrees of burnout and job dissatisfaction were more or less likely to respond to the survey. To our knowledge, this study represents the largest study of burnout among this population. Additionally, there is some validity evidence supporting the CBI in human service work but none for use in this specific population in the United States—respondents may not have interpreted questions as intended, and the 3 burnout scales may not truly measure the same constructs in PAs.

As next steps, longitudinal studies should be conducted to explore variations in burnout levels in PAs throughout the academic year, whether those considering leaving their positions actually did so, and any impact that interventions may have in mitigating this effect.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

Conclusion

These findings suggest that burnout among a cohort of PAs from across the country is high, and those who have considered leaving their positions had higher burnout levels than those who have not.

References

1. Freudenberger HJ. Staff burnout. *J Soc Issues*. 1974;30(1):159–165.
2. Maslach C, Jackson SE. The measurement of experienced burnout. *J Occup Behav*. 1981;2(2):99–113.
3. Shanafelt T, Goh J, Sinsky C. The business case for investing in physician well-being. *JAMA Intern Med*. 2017;177(12):1826–1832. doi:10.1001/jamainternmed.2017.4340.
4. Kumar S. Burnout and doctors: prevalence, prevention and intervention. *Healthcare*. 2016;4(3):37. doi:10.3390/healthcare4030037.
5. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc*. 2015;90(12):1600–1613. doi:10.1016/j.mayocp.2015.08.023.
6. Williams ES, Manwell LB, Konrad TR, Linzer M. The relationship of organizational culture, stress, satisfaction, and burnout with physician-reported error and suboptimal patient care: results from the MEMO study. *Health Care Manage Rev*. 2007;32(3):203–212. doi:10.1097/01.HMR.0000281626.28363.59.
7. West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD. Association of resident fatigue and distress with perceived medical errors. *JAMA*. 2009;302(12):1294–1300. doi:10.1001/jama.2009.1389.
8. Bakker AB, Le Blanc PM, Schaufeli WB. Burnout contagion among intensive care nurses. *J Adv Nurs*. 2005;51(3):276–287. doi:10.1111/j.1365-2648.2005.03494.x.
9. Welp A, Meier LL, Manser T. The interplay between teamwork, clinicians' emotional exhaustion, and clinician-rated patient safety: a longitudinal study. *Crit Care*. 2016;20(1):110. doi:10.1186/s13054-016-1282-9.
10. Winwood PC, Winefield AH. Comparing two measures of burnout among dentists in Australia. *Int J Stress Manage*. 2004;11(3):282–289.
11. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: a new tool for the assessment of burnout. *Work Stress*. 2005;19(3):192–207.
12. Henriksen L, Lukasse M. Burnout among Norwegian midwives and the contribution of personal and work-related factors: a cross-sectional study. *Sex Reprod Healthc*. 2016;9:42–47. doi:10.1016/j.srhc.2016.08.001.
13. Madsen IE, Lange T, Borritz M, Rugulies R. Burnout as a risk factor for antidepressant treatment—a repeated measures time-to-event analysis of 2936 Danish human service workers. *J Psychiatr Res*. 2015;65:47–52. doi:10.1016/j.jpsychires.2015.04.004.
14. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377–381. doi:10.1016/j.jbi.2008.08.010.
15. Shanafelt TD, Gradishar WJ, Kosty M, Satele D, Chew H, Horn L, et al. Burnout and career satisfaction among US oncologists. *J Clin Oncol*. 2014;32(7):678–686. doi:10.1200/JCO.2013.51.8480.
16. Busis NA, Shanafelt TD, Keran CM, Levin KH, Schwarz HB, Molano JR, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology*. 2017;88(8):797–808. doi:10.1212/WNL.0000000000003640.
17. Cass I, Duska LR, Blank SV, Cheng G, duPont NC, Frederick PJ, et al. Stress and burnout among gynecologic oncologists: a society of gynecologic oncology evidence-based review and recommendations. *Gynecol Oncol*. 2016;143(2):421–427. doi:10.1016/j.ygyno.2016.08.319.
18. Kassam A, Horton J, Shoimer I, Patten S. Predictors of well-being in resident physicians: a descriptive and psychometric study. *J Grad Med Educ*. 2015;7(1):70–74. doi:10.4300/J-D-14-00022.1.
19. Ratnakaran B, Prabhakaran A, Karunakaran V. Prevalence of burnout and its correlates among residents in a tertiary medical center in Kerala, India: a cross-sectional study. *J Postgrad Med*. 2016;62(3):157–161. doi:10.4103/0022-3859.184274.
20. Prins JT, Gazendam-Donofrio SM, Tubben BJ, van der Heijden FM, van de Wiel HB, Hoekstra-Weebers JE. Burnout in medical residents: a review. *Med Educ*. 2007;41(8):788–800. doi:10.1111/j.1365-2923.2007.02797.x.
21. Buchbinder SB, Wilson M, Melick CF, Powe NR. Primary care physician job satisfaction and turnover. *Am J Manag Care*. 2001;7(7):701–713.
22. Sibbald B, Bojke C, Gravelle H. National survey of job satisfaction and retirement intentions among general practitioners in England. *BMJ*. 2003;326(7379):22. doi:10.1136/bmj.326.7379.22.
23. Landon BE. Reschovsky JD, Pham HH, Blumenthal D. Leaving medicine: the consequences of physician

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access

dissatisfaction. *Med Care*. 2006;44(3):234–242. doi:10.1097/01.mlr.0000199848.17133.9b.

24. Shanafelt T, Sloan J. Satele D. Balch C. Why do surgeons consider leaving practice? *J Am Coll Surg*. 2011;212(3):421–422. doi:10.1016/j.jamcollsurg.2010.11.006.
25. Shanafelt TD, Raymond M, Kosty M, Satele D, Horn L, Pippen J, et al. Satisfaction with work-life balance and the career and retirement plans of US oncologists. *J Clin Oncol*. 2014;32(11):1127–1135. doi:10.1200/JCO.2013.53.4560.
26. Hann M, Reeves D, Sibbald B. Relationships between job satisfaction, intentions to leave family practice and actually leaving among family physicians in England. *Eur J Public Health*. 2011;21(4):499–503. doi:10.1093/eurpub/ckq005.
27. Rittenhouse DR, Mertz E, Keane D, Grumbach K. No exit: an evaluation of measures of physician attrition. *Health Serv Res*. 2004;39(5):1571–1588. doi:10.1111/j.1475-6773.2004.00304.x.
28. Accreditation Council for Graduate Medical Education. About Us. https://www.ac.org/About-Us/Overview. Accessed June 3, 2019.

Alana M. Ewen, MPH, is a Data Analyst, Graduate Medical Education, Boston Medical Center; **Mikhail C.S.S. Higgins, MD, MPH,** is Assistant Professor, Division of Interventional Radiology, Department of Radiology, Boston University School of Medicine, Boston Medical Center; **Sandra Palma, BA,** is Residency Coordinator, Department of Radiology, Brigham and Women's Hospital; **Kathryn Whitley, BA, C-TAGME,** is Residency and Fellowship Coordinator, Department of Family Medicine, Boston University School of Medicine, Boston Medical Center; and **Jeffrey I. Schneider, MD,** is Associate Professor, Department of Emergency Medicine, Boston University School of Medicine, and Designated Institutional Official, Boston Medical Center.

Funding: The authors report no external funding source for this study.

Conflict of interest: The authors declare they have no competing interests.

Baseline findings were previously presented at the Association for Hospital Medical Education Institute, Phoenix, Arizona, May 16–18, 2018.

Corresponding author: Jeffrey I. Schneider, MD, Boston Medical Center, Graduate Medical Education, Doctors Office Building 505, 720 Harrison Avenue, Boston, MA 02118, 617.414.4064, jeffrey.schneider@bmc.org

Received November 6, 2018; revision received May 6, 2019; accepted May 8, 2019.

Downloaded from https://prime-pdf-watermark.prime-prod.pubfactory.com/ at 2025-10-27 via free access