

Funding/Support: Dr Adesoye is supported by the University of Texas MD Anderson Cancer Center Surgical Oncology Research Training Program (T32 CA009599); Dr Simard, of the Physician Moms Group Study Group is supported by the National Institutes of Health (NIH) National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) grant K01-AR066878; Dr Linos is supported by National Institute on Aging Beeson award K76AG054631; Dr Mangurian is supported by NIH grant K23MH093689; and Dr Choo is supported by National Institute on Drug Abuse grant 5K23DA031881.

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Group Information: Members of the Physician Moms Group Study Group who contributed to this article: Julia F. Simard, ScD (Stanford University), Kathrin LaFaver, MD (University of Louisville), Amanda Montalbano, MD, MPH (University of Missouri–Kansas City School of Medicine), Christina S. Han, MD (University of California, Los Angeles), Adi Nosrati, MD (University of California, San Francisco), Dina Seif, MD, MBA (University of Southern California Keck School of Medicine), and Mary-Margaret Chren, MD (University of California, San Francisco).

Additional Contributions: We thank Alexandra Junn, AB, and Alexandra Jacob, MS, for data support (compensated in the normal course of their employment); Elizabeth Linos, PhD (uncompensated), and Amy J. Markowitz, JD (compensated), for critical editing; and the members of Physician Moms Group (uncompensated) for their participation.

1. Tsugawa Y, Jena AB, Figueroa JF, Orav EJ, Blumenthal DM, Jha AK. Comparison of hospital mortality and readmission rates for Medicare patients treated by male vs female physicians. *JAMA Intern Med.* 2017;177(2):206-213.
2. Jena AB, Olenski AR, Blumenthal DM. Sex differences in physician salary in US public medical schools. *JAMA Intern Med.* 2016;176(9):1294-1304.
3. Jena AB, Khullar D, Ho O, Olenski AR, Blumenthal DM. Sex differences in academic rank in us medical schools in 2014. *JAMA.* 2015;314(11):1149-1158.
4. Jolly S, Griffith KA, DeCastro R, Stewart A, Ubel P, Jagsi R. Gender differences in time spent on parenting and domestic responsibilities by high-achieving young physician-researchers. *Ann Intern Med.* 2014;160(5):344-353.
5. Physician Moms Group. My PMG: join the community. <https://mypmg.com/>. Accessed March 9, 2017.
6. Linzer M, Poplau S, Babbott S, et al. Worklife and wellness in academic general internal medicine: results from a national survey. *J Gen Intern Med.* 2016;31(9):1004-1010.

PHYSICIAN WORK ENVIRONMENT AND WELL-BEING

Workplace Factors Associated With Burnout of Family Physicians

Burnout is on the rise, with over half of US physicians reporting at least 1 symptom in 2014.¹ Physician burnout has negative impacts on both physician well-being and patient care.¹ Addressing burnout is imperative to improving the care of patients, promoting the health of physicians, and reducing health care costs. Practice features associated with burnout include clinic demands, paperwork, and maintaining work/life balance.² Our purpose was to examine burnout in a national sample of board certified family physicians.

Methods | We used data from the family physicians seeking to continue their American Board of Family Medicine (ABFM) certification in 2016. All examinees completed an application questionnaire with core questions and 1 of 5 additional question sets. The strategy produces representative samples.³ One of these was the Mini Z survey.² We assessed burnout with a

single item that correlates with the emotional exhaustion subscale of the Maslach Burnout Inventory.²

We used descriptive statistics and *t* tests or χ^2 tests for bivariate analyses. Finally, a multivariable logistic regression determined independent associations between other Mini Z variables with burnout. An additional model with all Mini Z variables included was used to determine associations controlling for all other variables. All analyses were conducted in SAS statistical software (version 9.3, SAS Institute). This study was approved by the American Academy of Family Physicians institutional review board, and written informed consent was waived because the analysis was of secondary data that is routinely collected for business purposes.

Results | Of 9452 practicing family physicians, 1923 (20.3%) were administered the Mini Z. Physicians administered the Mini Z were demographically similar to those not receiving it and were mostly men (1122 [58.3%]) and held an MD degree (1746 [90.8%]). We excluded 141 owing to missing data, for a final sample of 1752. Twenty-five percent (441 of 1752) reported symptoms of burnout (Table 1). The presence of burnout was associated with many work-related factors including less control over workload (35.1% vs 82.8%, $P < .001$), lack of sufficient time for documentation (21.1% vs 61.0%, $P < .001$), stress owing to their job (91.4% vs 38.4%, $P < .001$), and more time spent on electronic medical records (EMRs) at home (62.1% vs 38.7%, $P < .001$).

In adjusted analyses, we found positive independent associations between job stress (OR, 16.38; 95% CI, 11.49-23.37) and excessive time spent on EMRs at home (OR, 2.67; 95% CI, 2.12-3.38) with burnout (Table 2). Controlling for all variables in the Mini Z simultaneously attenuated the strength of the associations for all variables and resulted in efficient team work, excessive time spent on EMRs at home, and EMR proficiency losing statistical significance.

Discussion | In a national sample of family physicians, 25% reported symptoms of burnout, which is substantially lower than estimates using the Maslach Burnout Inventory (63%)¹ but is closer to estimates of academic general internists (38%) using the Mini Z.² Burnout was associated with multiple workplace-related factors, with the strongest associations being stress and hectic/chaotic work area.

Electronic medical record-related variables were not significant when controlling for other workplace factors, whereas insufficiency of time for documentation remained significant. With recent findings that physicians spend half as much time on direct clinical contact as on EMRs and desk work,⁴ our findings concur with others that the tasks required for EMR use are associated with burnout, not the EMR itself.⁵ This disproportionate time documenting may decrease the potentially protective benefits of patient contact.⁶

Our study has several limitations. First, although the sample was national, early career physicians are under-sampled because recertification occurs at least 7 years after residency. Furthermore, because the Mini Z only correlates with 1 domain of burnout, the difference in prevalence with other studies may be owing to the use of different assessments.



Related article page 1033

Table 1. Presence of Burnout by Personal and Practice Characteristics and Mini Z Responses From Family Physicians Attempting to Continue the American Board of Family Medicine Certification in 2016^a

Characteristic	No. (%)			P Value
	Total Family Physicians (N = 1752)	Burned Out (N = 441)	Not Burned Out (N = 1311)	
Overall, I am satisfied with my current job (agree/strongly agree)	1308 (74.7)	193 (43.8)	1115 (85.0)	<.001
I feel a great deal of stress because of my job (agree/strongly agree)	907 (51.8)	403 (91.4)	504 (38.4)	<.001
My control over my workload is (satisfactory/good/optimal)	1240 (70.8)	155 (35.1)	1085 (82.8)	<.001
Sufficiency of time for documentation is (satisfactory/good/optimal)	893 (51.0)	93 (21.1)	800 (61.0)	<.001
Which number best describes the atmosphere in your primary work area? (4 or 5 on 5 point scale with 5 being "hectic, chaotic")	599 (34.2)	252 (57.1)	347 (26.5)	<.001
My professional values are well aligned with those of my department leaders (agree/strongly agree)	1119 (63.9)	184 (41.7)	935 (71.3)	<.001
The degree to which my care team works efficiently together is (satisfactory/good/optimal)	1620 (92.5)	365 (82.8)	1255 (95.7)	<.001
The amount of time I spend on the EMR at home is (excessive/moderately high)	782 (44.6)	274 (62.1)	508 (38.7)	<.001
My proficiency with EMR use is (satisfactory/good/optimal)	1652 (94.3)	404 (91.6)	1248 (95.2)	.01

Abbreviation: EMR, electronic medical record.

^a Burnout identified by Mini Z item "Using your own definition of burnout, please select one of the answers" and the responses "I am definitely burning out and have one or more symptoms of burnout, eg emotional exhaustion." "The symptoms of burnout that I'm experiencing won't go away. I think about work frustrations a lot." "I feel completely burned out. I am at the point where I may need to seek help." indicating burnout.

Table 2. Adjusted Associations Between Practice Characteristics With Burnout Among 1752 Family Physicians Seeking to Continue Their Certification With the American Board of Family Medicine in 2016^a

Characteristic	Odds Ratio (95% CI)	
	For Each Variable Independently Controlling for Demographic and Practice Characteristics	With All Other Variables Included in the Model
Overall, I am satisfied with my current job (agree/strongly agree)	0.13 (0.10-0.16)	0.29 (0.21-0.39)
I feel a great deal of stress because of my job (agree/strongly agree)	16.38 (11.49-23.37)	9.06 (6.13-13.38)
My control over my workload is (satisfactory/good/optimal)	0.11 (0.08-0.14)	0.32 (0.23-0.44)
Sufficiency of time for documentation is (satisfactory/good/optimal)	0.17 (0.13-0.22)	0.57 (0.40-0.81)
Which number best describes the atmosphere in your primary work area? (4 or 5 on 5 point scale with 5 being "hectic, chaotic")	3.61 (2.86-4.55)	1.42 (1.06-1.91)
My professional values are well aligned with those of my department leaders (agree/strongly agree)	0.28 (0.22-0.35)	0.64 (0.47-0.87)
The degree to which my care team works efficiently together is (satisfactory/good/optimal)	0.21 (0.15-0.31)	0.88 (0.53-1.44)
The amount of time I spend on the EMR at home is (excessive/moderately high)	2.67 (2.12-3.38)	1.12 (0.81-1.55)
My proficiency with EMR use is (satisfactory/good/optimal)	0.46 (0.30-0.72)	0.72 (0.40-1.29)

Abbreviation: EMR, electronic medical record.

^a Variables controlled for in both regression models include previous certification examination result, sex, age, degree type, international medical graduate status, race and ethnicity, percent time in direct patient care, practice size, organization and ownership status, patient-centered medical home status, and scope of practice.

Conclusions | Our findings suggest that burnout among family physicians is not uncommon. Future interventions to reduce burnout and improve patient care and physician satisfaction can be targeted toward addressing workplace factors.

Monee Rassolian, MD
Lars E. Peterson, MD, PhD
Bo Fang, PhD
H. Clifton Knight Jr, MD
Michael R. Peabody, PhD
Elizabeth G. Baxley, MD
Arch G. Mainous III, PhD

Author Affiliations: McLaren Flint Family Medicine Residency, Michigan State University, Flint (Rassolian); American Board of Family Medicine, Lexington, Kentucky (Peterson, Fang, Peabody); American Academy of Family Physicians, Leawood, Kansas (Knight); Brody School of Medicine, East Carolina University, Greenville, North Carolina (Baxley); Department of Health Services Research, Management, and Policy, University of Florida, Gainesville (Mainous); Department of Community Health and Family Medicine, University of Florida, Gainesville (Mainous).

Corresponding Author: Monee Rassolian, MD, North Park Medical Center, 2355 Keele St, Toronto, ON M6M 4A2, Canada (mrassolian@hotmail.com).

Accepted for Publication: February 17, 2017.

Published Online: May 8, 2017. doi:10.1001/jamainternmed.2017.1391

Author Contributions: Dr Peterson had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Rassolian, Peterson, Mainous.

Acquisition, analysis, or interpretation of data: Rassolian, Peterson, Baxley, Knight, Peabody, Fang.

Drafting of the manuscript: Rassolian, Peterson, Mainous.

Critical revision of the manuscript for important intellectual content: Rassolian, Peterson, Baxley, Knight, Peabody, Fang.

Statistical analysis: Rassolian, Peterson, Peabody, Fang.

Administrative, technical, or material support: Peterson, Baxley, Knight.

Study supervision: Rassolian, Peterson, Mainous.

Conflict of Interest Disclosures: Drs Peabody and Peterson are employees of the American Board of Family Medicine Foundation. No other disclosures are reported.

Additional Contributions: Thomas R. O'Neill, PhD, and James C. Puffer, MD, from the American Board of Family Medicine and Andrew W. Bazemore, MD, MPH, from the Robert Graham Center, contributed to the conception of this project. They were not compensated.

1. Shanafelt TD, Hasan O, Dyrbye LN, 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.
2. Linzer M, Poplau S, Babbott S, et al. Worklife and wellness in academic general internal medicine: results from a national survey. *J Gen Intern Med.* 2016;31(9):1004-1010.
3. Coutinho AJ, Cochrane A, Stelter K, Phillips RL Jr, Peterson LE. Comparison of intended scope of practice for family medicine residents with reported scope of practice among practicing family physicians. *JAMA.* 2015;314(22):2364-2372.
4. Sinsky C, Colligan L, Li L, et al. Allocation of physician time in ambulatory practice: a time and motion study in 4 specialties. *Ann Intern Med.* 2016;165(11):753-760.
5. Shanafelt TD, Dyrbye LN, Sinsky C, et al. Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. *Mayo Clin Proc.* 2016;91(7):836-848.
6. Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA.* 2009;302(12):1284-1293.

Association of Appearance of Conflicts of Interest With Voting Behavior at FDA Advisory Committee Meetings—A Cross-sectional Study

To ensure objectivity on the 49 advisory committees (ACs) of the US Food and Drug Administration (FDA), the FDA reviews disclosure statements submitted by members for 2 potentially disqualifying types of financial conflict of interest (COI): “section 208 conflicts” (regulated under 18 USC §208¹) and, for those without section 208 conflicts, “section 502 conflicts” (regulated under 5 CFR §2635.502²). While section 208 conflicts are created by current financial interests, section 502 conflicts are typically created by past financial interests or personal and business relationships that could create the appearance of a conflict. For both, the FDA may either exclude the individual from participation or allow participation when permitted by statute. The FDA publicly discloses section 208 conflicts³ but not section 502 conflicts and has recently requested comments about whether these conflicts should be publicly disclosed.^{4,5}

We examined the prevalence of section 502 conflicts and their associations with voting behavior at FDA AC meetings.

Methods | We obtained internal agency information for AC meetings with votes on drugs and devices held between 2008 and 2014 for which COI screening was required. For meetings with section 502 conflicts present, we determined the prevalence and characteristics of both section 208 and section 502 conflicts and, for meetings related to particular products, assessed whether members with section 502 conflicts were more likely to vote with the majority than were members without these conflicts. For meetings with no section 208 conflicts and where the vote was not unanimous, we assessed whether the prevalence of section 502 conflicts was associated with the percentage of votes favorable to the product and with the meeting outcome. Finally, we examined whether excluding members with section 502 conflicts would have changed the meeting outcome. Institutional review board approval was not required because the study was not considered human subjects research.

Results | Of 385 AC meetings that met entry criteria, 27.3% (n = 105) included at least 1 voting member with a section 502 conflict; there was no trend over time. Of 1482 voting members in these meetings, 12.6% (n = 187) had section 502 conflicts only; 0.8% (n = 12) had section 208 conflicts only, and 0.9% (n = 14) had both. More detail is reported in **Table 1**. Individuals with only section 502 conflicts were typically organizational officers (36.9%; n = 69), had conflicts with sponsoring firms (89.3%; n = 167), and had *imputed COIs* (ie, COIs assigned based on members' personal relationships or employment) (61.0%; n = 114). Voting members with only section 208 conflicts were more likely than those with 502 conflicts to have conflicts with competing firms (58.3% [n = 7] vs 8.6% [n = 16]; Pearson $\chi^2 P < .001$) but were otherwise similar. The median values of section 502 and 208 conflicts were \$30 000 and under \$50 000, respectively (the financial value of section 208 conflicts is reported in ranges).

Of 151 votes on specific medical products by members with only section 502 conflicts, 132 (87.4%) concurred with the majority (**Table 2**). We found no association between the prevalence of section 502 conflicts and voting outcomes. Excluding members with section 502 conflicts generally would have produced voting margins more favorable to the product, but in no instance would the meeting outcome have changed between favoring and opposing the product. In 1 instance, excluding 2 members with only a section 502 conflict would have led to a tie vote rather than a vote opposing the product.

Discussion | Between 2008 and 2014, about a quarter of FDA AC meetings that met entry criteria included at least 1 participant with a section 502 conflict. Members with section 502 conflicts had voting patterns similar to those without such conflicts; there was no association between section 502 conflicts and meeting outcomes.

The study limitations were as follows: (1) including only meetings where at least 1 member had a section 502 conflict; (2) small sample sizes, particularly in the voting analyses; and (3) inability to control for other factors that might



Editorial page 919