

MAYO CLINIC PROCEEDINGS

Innovations, Quality & Outcomes

Promoting Well-being Among Neurology Residents: A Data-Driven Approach

Vijay K Ramanan, MD, PhD; Jery D. Inbarasu, MD; Lauren M. Jackson, MD; Lyell K. Jones, Jr, MD;; and James P. Klaas, MD

Abstract

Objective: To assess whether the creation of a formal structure to measure and promote wellness among neurology residents would facilitate the development of interventions associated with measurable improvements.

Methods: In 2018 we founded the Resident Wellness Committee for the Department of Neurology at our institution. The Resident Wellness Committee was led by resident and staff neurologist co-chairs and had as its vision to promote well-being through initiatives centered in work-life integration, emotional and physical well-being, and social engagement. Web-based surveys assessing various aspects of well-being were administered at baseline and 1 year after launch, comprising the period June 21, 2018, through June 30, 2019.

Results: Response rates were high at baseline (21 of 34; 62%) and follow-up (25 of 33; 76%). Interventions pursued in the interim included education on handling unexpected absences, adjustments to holiday schedule policies, infrastructure for nutrition and respite, and a team-based department fitness challenge, among others. Overall, at both timepoints more than 80% (18 of 21; 21 of 25) of respondents endorsed at least mild burnout symptoms, although clinical workload, independence, and education were overwhelmingly viewed positively throughout. Notable improvements at follow-up included greater comfort with adjusting schedules at times of need, increased camaraderie within the program, and a smaller proportion of respondents endorsing substantial burnout symptoms.

Conclusion: Through deliberate and sustained efforts backed by data, our work demonstrates that concrete changes can be successfully pursued to promote well-being among neurology residents. Given that Neurology has one of the highest burnout rates among medical specialties, our approach may serve as a model for other programs to replicate.

© 2020 THE AUTHORS. Published by Elsevier Inc on behalf of Mayo Foundation for Medical Education and Research. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>) ■ Mayo Clin Proc Inn Qual Out 2020;4(5):469-474

Physician burnout is a major threat to quality health care delivery and can result in poor medical decision making, diminished productivity, increased staff turnover, dissolution of relationships, and even self-harm.¹ Among medical specialties,

neurology is consistently among the highest in burnout rates, with the particularly ominous warning of burnout symptoms being more prevalent among neurology residents when compared with practicing neurologists and residents in other specialties.²⁻⁴



From the Department of Neurology, Mayo Clinic, Rochester, MN.

Several factors have been proposed to enhance physician well-being (and thus reduce burnout), including finding meaning in work, developing resilience, preserving autonomy, and minimizing clerical burden, among others.⁵⁻⁷ However, identifying specific steps to systematically support these values can seem challenging amid a rapidly changing health care landscape, competing demands from governing bodies, and the complexity of neurology itself. One perspective suggests that effective interventions to foster wellness need not necessarily be intricate or expensive as long as they arise from deliberate sustained efforts supported by the highest levels of leadership.¹ We sought to operationalize this concept, hypothesizing that a formal structure to assess and promote wellness within a neurology residency program would lead to initiatives yielding measurable improvements.

METHODS

The Resident Wellness Committee (RWC) for the Mayo Clinic in Rochester, Minnesota, Department of Neurology was founded in spring 2018. The committee was led by 2 neurology senior residents (V.K.R. and J.D.I.) and a staff neurologist (J.P.K.), who all served as co-chairs, with additional members including the neurology chief residents, elected residency class representatives, residency program director, and other staff neurology appointees. All committee members served on a voluntary basis. The mission of the RWC was to perform regular assessments of neurology resident wellness on a program level and develop interventions to promote resident wellness.

Based on discussion and group consensus, we defined the vision of the RWC as to promote neurology resident well-being through initiatives centered in 1 or more of the following domains:

1. Work-life integration: recognizing and addressing challenges related to the intersection of professional demands and personal life factors;
2. Emotional well-being: developing resilience and reinforcing meaning and purpose in work;

3. Physical well-being: facilitating the advancement of exercise, nutrition, sleep, and other physical health factors;
4. Social engagement: promoting a sense of community and camaraderie at work.

Study data reported here were acquired between June 21, 2018, and June 30, 2019. To provide a baseline assessment and inform priorities for the RWC, a web-based survey of residents (28 postgraduate year 2 [PGY2]-PGY4 Adult Neurology and 6 PGY3-PGY5 Child Neurology) was administered in June 2018. The baseline survey included 21 questions of a variety of response types, including modified 5-point Likert scale, multiple choice, and free text (Supplemental Table 1, available online at <https://mcpiqjournal.org>). Survey questions were generated and collectively approved by the co-chairs based on a previously enumerated framework on drivers of burnout and engagement in physicians (workload and job demands, efficiency and resources, meaning in work, culture and values, control and flexibility, social support and community at work, and work-life integration).¹ An additional question on burnout (question 19 from the baseline survey and question 17 from the follow-up survey) was derived from the single-item inventory used in the Physician Work Life Study.⁸

A follow-up survey of 19 questions was administered in June 2019 (Supplemental Table 2, available online at <https://mcpiqjournal.org>). The follow-up assessment included partial overlap of the questions and (due to matriculation) the respondent pool (28 PGY2-PGY4 Adult Neurology residents and 5 PGY3-PGY5 Child Neurology residents) compared with the baseline assessment. The decision to space out these surveys by 1 year was intended to satisfy the mission of the RWC (in performing regular assessments of wellness) without creating conditions for “survey fatigue” with its potential to negatively affect response rates and well-being.

Survey results including basic descriptive statistics were reviewed by the RWC and used to target areas for improvement. Subgroups were identified to develop interventions and present these to the full committee. Initiatives were implemented following discussion, group consensus, and approval of the

program director. Quarterly in-person and electronic updates on the committee's efforts were provided to neurology residents and the Resident Education Committee.

RESULTS

The baseline assessment had a response rate of 62% (21 of 34). Reflecting on the preceding year, 29% (n=6) of respondents endorsed substantial symptoms of burnout (“I felt persistent exhaustion or frustration about work” or “I felt completely burned out and wondered if I could go on”), and an additional 57% (n=12) endorsed milder symptoms of burnout (“occasionally I was under stress and lacked energy” or “I felt transiently emotionally or physically exhausted due to work”). Additional areas of concern included having easy access to healthy food and beverages (33% [n=7] strongly or mostly agreed), access to personal space in the workplace (57%; n=12), and flexibility to adjust schedules in the event of an illness or other major life event (62%; n=13). In contrast, nearly all respondents strongly or mostly agreed that they had appropriate levels of clinical independence and supervision (90%; n=19) and that they were learning or growing as neurologists (90%; n=19).

The baseline survey results were reviewed by the RWC. During the following year the committee pursued initiatives targeting areas for improvement identified in the survey (Supplemental Table 3, available online at <https://mcpiqjournal.org>).

Regarding work-life integration, interventions included education on protocols for urgent or emergent absences, modification to the block schedule structure to facilitate each resident spending at least 1 winter holiday on a non-inpatient rotation, and development of a database to track holidays worked during residency for future planning. In particular, the education on absences included a 1-page bulleted handout shared by email and posted on the department website, which listed example scenarios, methods to contact key individuals, and resources for medical assistance, child care, and institutional leave policies. In addition, the chief residents used the new holiday database when generating call schedules to aim for a more equitable distribution of holidays worked across the program and identify

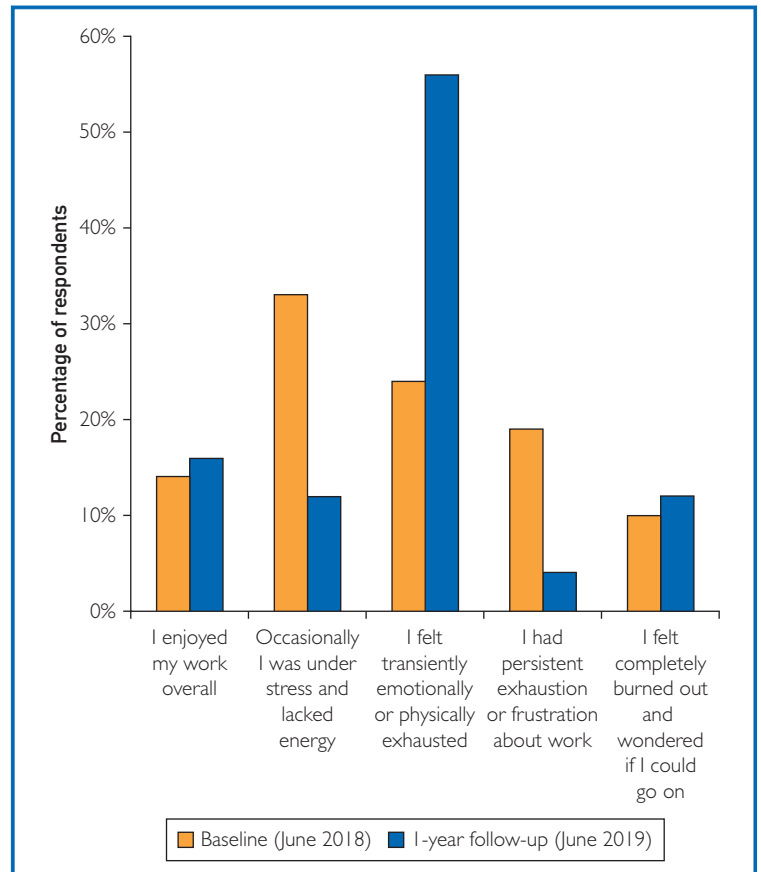


FIGURE. Single-item assessment of overall wellness at baseline and 1-year follow-up. Bar graphs display survey responses for a summary item assessing overall wellness at baseline and at 1-year follow-up after formation of the Resident Wellness Committee. The survey item used was derived from the single-item inventory for overall wellness used in the Physician Work Life Study. At the follow-up assessment after interventions over the preceding year from the Resident Wellness Committee, a smaller percentage of respondents (16%) endorsed substantial symptoms of burnout (rightmost 2 categories), a decrease of 13% compared with the baseline survey. Milder symptoms of burnout (“occasionally I was under stress and lacked energy” or “I felt transiently emotionally or physically exhausted due to work”) were reported by majorities of the respondents at both time points (57% and 68%, respectively).

contingencies when an individual resident, out of necessity, was assigned to work on numerous consecutive holidays.

Infrastructure was addressed to promote physical well-being, including adding a resident-only mini-refrigerator to the hospital workroom, rededicating existing storage space for residents, increasing security and emphasizing availability of call rooms, and arranging for hot lunches (in place of existing cold lunches) at hospital noon conferences. With

the exception of the mini-refrigerator (\$240), none of these interventions imparted a financial cost to the residency program.

To foster community within the department and promote physical well-being, a 6-week team-based fitness challenge was organized, using a department-owned website for logging of activities, incentives for partner pairings across levels of training (eg, staff neurologist–resident) and photos of teams exercising together, and modest prizes for the winners. Forty-five individuals participated in the fitness challenge (of 245 invited; 18%), with more than 500 hours of exercise logged. Department-supported resident-only evening social events were also organized on a quarterly basis, with the primary goal of promoting camaraderie within the residency program. Typical attendance at these events included 15 to 20 individuals (approximately half the size of the residency program) and cost of \$10 or less per attendee.

The 1-year follow-up assessment had a response rate of 76% (25 of 33). Reflecting on the past year, 16% (n=4) of respondents endorsed substantial symptoms of burnout (“I had persistent exhaustion or frustration about work” or “I felt completely burned out and wondered if I could go on”), a decrease of 13% (versus 6 of 21 = 29%) compared to the baseline survey (Figure). Milder symptoms of burnout (“Occasionally I was under stress and lacked energy” and “I felt transiently emotionally or physically exhausted due to work”) were still reported by 68% (17 of 25) of respondents. Impressions remained strongly positive regarding the perception of the residency program caring about trainee well-being (92% [23 of 25] vs 86% [18 of 21] at baseline). Although the balance between education and clinical (direct patient care) workload related to patient volume was widely believed to be appropriate (88%; n=22), 60% (n=15) of respondents indicated that their nonclinical workload (such as didactics, assessments related to board certification, and evaluations, among other clerical burdens) was too heavy and adversely affected their education.

Some items on the follow-up survey were related to specific interventions from the preceding year (Supplemental Figure, available online at <https://mcpiqjournal.org>). For example, 80% (n=20 of 25) of respondents strongly or

mostly agreed that they had flexibility to adjust schedules in the event of an illness or other major life event, an increase from 62% (n=13 of 21) at baseline. In addition, at follow-up, a higher percentage of respondents (28% [7 of 25] vs 19% [4 of 21] at baseline) indicated that they frequently spent time with others in the program or department outside of work, and large majorities (96% [n=24] and 88% [n=22], respectively) reported positive impressions about the resident-dedicated refrigerator and the department fitness challenge. Easy access to workspace in the hospital (80%; n=20) and outpatient clinics (92%; n=23) was noted by nearly all respondents. Although easy access to personal space in the hospital was indicated by a majority (68%; n=17), only 44% (n=11) believed that they had easy access to personal space in the outpatient clinics, where no infrastructure initiatives had been pursued. A higher proportion of respondents endorsed substantial access to mentoring at follow-up (92% [23 of 25] strongly or mostly agree vs 76% [16 of 21] at baseline), corresponding to a more structured 1:1 faculty-resident mentoring program implemented during the previous year outside of the RWC.

DISCUSSION

Through a new committee and a data-guided approach, we initiated specific steps to enhance wellness among neurology residents at our institution. Although optimizing physician well-being is a complex challenge that extends beyond a discrete time window at a single institution, our work demonstrates that concrete changes in infrastructure, policy, and culture can be successfully pursued at a local level, often with positive effects achieved at relatively low cost. More broadly, our approach, which used a comprehensive view of wellness, systematic measurements of aspects of well-being, and creation of a formal group empowered to develop interventions, serves as a model that can be adapted and applied in other settings.

Prior national surveys have suggested that burnout symptoms are more common among neurology residents than practicing neurologists.^{2,3} Notably in these surveys, factors associated with burnout among US neurologists, including excessive clinical workload, clerical duties, diminished autonomy, and lack of

support staff, were not directly implicated by neurology residents, suggesting that different dynamics may be at work during training. Building on this, we found that burnout symptoms continued to be highly prevalent in our sample even though clinical workload, independence, and growth and education were viewed overwhelmingly positively. Instead, vulnerabilities were identified in other areas, including schedule flexibility at times of emergency, onsite resources related to nutrition and respite, and nonclinical workload. Among practicing neurologists, clerical work related to electronic medical record systems has been a particular flashpoint.² Informally, among our residents this was less of a concern than other demands not directly related to patient care and education. One could speculate that with most residents having started their clinical training in the era of electronic medical records (and thus not having to make substantial adjustments from a prior state of functioning), this particular factor may have relatively less of an impact on burnout than for neurologists at more advanced career stages.

A distinctive strength of our intervention included the RWC leadership structure of residents and a staff neurologist serving as co-chairs. This feature, unique within the committee structure of our residency program, provided a balance of input and influence key for the credibility of the new committee and demonstrated commitment and engagement from program and department leadership. We also considered it an asset that the residency program director was a member of the RWC because this facilitated identification of resources, attention to potentially conflicting priorities, and implementation of policy changes without compromising the openness of input. In addition, the response rates to our baseline and follow-up surveys were relatively high (62% = 21 of 34) and 76% [25 of 33], respectively) compared with the approximately 40% response rates attained in prior national surveys of trainees.³ This overall strengthens the validity of our findings, with the recognition that local surveys may tend to have higher response rates than national ones and that survey approaches may be self-selecting for individuals who are not struggling with well-being.

Our approach has notable limitations from an operational standpoint. Features of the data and initiatives described here may reflect the

particular experience of neurology residents at our institution and thus may not be generalizable to other settings. Regarding the single-item inventory assessing burnout, following the interventions from the RWC, there was a shift toward the presence of milder symptoms of burnout, though the overall prevalence of burnout symptoms of any intensity was not appreciably changed. Further, our interventions and assessments were not designed to demonstrate causality, particularly in the setting of some survey respondents also being members of the RWC and given the nature of residency with its frequent personnel turnover.

This work also has several methodological limitations. Rather than using a standardized inventory, we chose to develop our own wellness assessments that were partially but not completely identical at the 2 measured time points. This decision was motivated primarily by the goal of using the survey data to guide the development of locally applicable interventions. Our perspective was that the broad nature of most items in standardized wellness scales would be of more limited utility to the RWC in identifying institution-specific areas for improvement, particularly in the early stages of the committee's existence. A downside of this approach is that it creates challenges for direct comparison of our data with those using other assessments of well-being. More broadly, this scenario highlights an ongoing weakness in the extant literature on physician wellness, whereby variability in definitions of burnout, choice of assessment inventories, and even scoring of methods of standardized instruments all inhibit meta-analyses and wider integration of findings.⁹ In addition, due to the modest size of the respondent pool, we did not attempt to account for potential year-in-training or calendar effects, which may affect well-being due to differences in work schedule structure, personal life stages, and batch effects related to individual residency class culture.

In addition to continuing these successful initial interventions and pursuing specific ideas raised by our follow-up survey (Supplemental Table 4, available online at <https://mcpiqojournal.org>), ongoing plans include the creation of a wellness curriculum consisting of quarterly daytime activities centered around at least 1 of the RWC's core values (work-life integration, emotional and physical well-

being, community, and camaraderie). The aim of this curriculum is to provide regular and structured touchpoints on topics related to well-being. Preliminary proposals for this curriculum have included sessions on yoga, pet therapy, and a recurring presentation from a local expert on developing resilience. To provide external perspective, it may also be valuable to consider the addition of a member to the RWC who is not affiliated with the Department of Neurology. Further, because age and sex differences are understood to affect neurologist well-being,¹⁰ upcoming interventions may maximize their benefits if they are designed to address these and other personalized factors.

CONCLUSION

Through the formation of a new committee tasked with measuring and promoting well-being, we demonstrated that concrete changes can be successfully pursued at a local level to combat burnout symptoms among neurology residents. We anticipate that additional sustained efforts to promote wellness among neurology residents will affect individual and program morale, recruitment and retention, and institutional and national best practices.

ACKNOWLEDGMENTS

The authors thank the members of the Mayo Clinic Neurology Resident Wellness Committee for their efforts and initiatives described in the article, and the staff from the Department of Neurology at the Mayo Clinic in Rochester, Minnesota, for administrative support.

SUPPLEMENTAL ONLINE MATERIAL

Supplemental material can be found online at <https://mcpiqjournal.org>. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

Abbreviations and Acronyms: PGY = postgraduate year; RWC = Resident Wellness Committee

Potential Competing Interests: The authors declare no competing interests. No targeted funding was used for this study.

Correspondence: Address to Vijay K Ramanan, MD, PhD, 200 1st St SW, Rochester, MN 55905 (ramanan.vijay@mayo.edu; Twitter: [@vijaykramanan](https://twitter.com/vijaykramanan)).

ORCID

Vijay K Ramanan:  <https://orcid.org/0000-0001-6591-8734>

REFERENCES

- Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc*. 2017;92(1):129-146.
- Buis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology*. 2017;88(8):797-808.
- Levin KH, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurology residents and fellows in 2016. *Neurology*. 2017;89(5):492-501.
- Dyrbye LN, Burke SE, Hardeman RR, et al. Association of clinical specialty with symptoms of burnout and career choice regret among US resident physicians [JAMA. 2019;321(12):1220-1221: notice of retraction and replacement. Dyrbye et al. Association of clinical specialty with symptoms of burnout and career choice regret among US resident physicians. *JAMA*. 2018;320(11):1114-1130]. *JAMA*. 2018;320(11):1114-1130.
- Swensen S, Kabcenell A, Shanafelt T. Physician-organization collaboration reduces physician burnout and promotes engagement: the Mayo Clinic experience. *J Healthc Manag*. 2016;61(2):105-127.
- Llinas RH, Marsh EB, Gamaldo CE. Residency training: enhancing resiliency in our residents: combining the principles of business and neurobiology. *Neurology*. 2018;91(18):e1721-e1723.
- Bursch B, Mulligan C, Keener AM, et al. Education research: evaluation of curriculum to teach resilience skills to neurology residents. *Neurology*. 2019;92(11):538-541.
- Dolan ED, Mohr D, Lempa M, et al. Using a single item to measure burnout in primary care staff: a psychometric evaluation. *J Gen Intern Med*. 2015;30(5):582-587.
- Rotenstein LS, Torre M, Ramos MA, et al. Prevalence of burnout among physicians: a systematic review. *JAMA*. 2018;320(11):1131-1150.
- LaFaver K, Miyasaki JM, Keran CM, et al. Age and sex differences in burnout, career satisfaction, and well-being in US neurologists. *Neurology*. 2018;91(20):e1928-e1941.