Editors' Note: In a survey of US American Academy of Neurology member neurologists who had finished training, Busis et al. found that approximately 60% had at least one symptom of burnout. Burnout was strongly associated with decreased career satisfaction, while meaningful work and job autonomy were associated with increased satisfaction. Several of our readers commented on the study. Bagot et al. note that the practice settings in the report did not specifically reference telemedicine. They suggest that additional telemedicine responsibilities may cause more burnout, but can also moderate burnout risk and augment professional satisfaction via meaningful work. Dr. Giannouli worries that the choice of binary logistic regressions with only individual-level variables neglects the importance of working group dynamics. Dr. Yanofsky opposes the use of the word burnout, finding it demeaning. He argues that the term physician dissatisfaction syndrome should be used instead. Dr. Berger mentions Dr. Cascino's 2017 Presidential Plenary Address, in which he presented a figure from a larger survey of US physicians in general that correlated the percentage of physicians with burnout identified by specialty with the percentage satisfied with their work-life balance. In his presentation, Dr. Cascino suggested that there was nothing unique about neurologists that predisposed them to burnout, but Dr. Berger proposes otherwise. He explains that neurologists tend to have a unique personality predisposing them to burnout. He further adds that neurologists spend a great deal of time eliciting patient histories and performing detailed examinations, which work against demands for more relative value units, time to input information in the electronic medical record, and fighting with insurance companies, which can lower job satisfaction. Finally, Dr. Sethi mentions 2 additional factors contributing to burnout. One is the electronization of medicine, which makes doctors always reachable electronically to patients. The other is the increasing mandatory continuing medical education requirements and maintenance of certification (MOC) requirements. In response to the telemedicine issue, Busis et al., authors of the study, explain that they surveyed neurologists who mostly practice fee-for-service face-to-face medicine and that telemedicine was not a choice for their questions on primary work setting and primary types of patients seen. Their survey can be adapted to study neurologists practicing under newer health care delivery and payment models, including telemedicine. In response to the issues with the neurologists' practice context that may influence burnout, they agree that there is an effect of the practice environment on individual physicians and networks of physicians; they suggest that future studies exploring the effects of neurologists' practice frameworks on burnout, career satisfaction, and well-being using multilevel analyses may yield valuable insights. In response to using the term physician dissatisfaction syndrome instead of burnout, Busis et al. disagree, stating that burnout has been a well-defined construct for more than 40 years and is evaluated in all types of workers, including extensive research in physicians. In response to the idea that neurologist personality type plays a role in burnout, they also disagree, stating that psychiatrists overlap with neurologists in their personality type, yet psychiatrists are among the specialties with the highest work-life balance satisfaction and the lowest burnout rates. However, the authors point out that the high prevalence of neurologist burnout may be due to misalignment of the neurologic method with the current health care environment. Finally, in response to the electronization of medicine and MOC requirements issues, Busis et al. explain that they did study those variables in their surveys. They add that clerical burden, electronic health records, and computerized order entry are associated with physician burnout, but there is no association between attitudes toward MOC and burnout. They conclude that there is a need for evidence-based health care policies, jettisoning administrative tasks that do not add value.

—Chafic Karam, MD, and Steven Galetta, MD

LETTER RE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Kathleen L. Bagot, Dominique A. Cadilhac, Joosup Kim, Michelle Vu, Christopher F. Bladin, Melbourne, Australia: From a recent workforce survey, Busis et al.¹ reported that 63% of neurologists in clinical practice had at least one symptom of burnout. Burnout and percentage of clinical practice time were associated with decreased professional satisfaction. However, meaningful work and job autonomy were associated with increased satisfaction.

We noted that practice settings in the report did not specifically reference telemedicine. We examined consultant neurologists' experiences conducting acute stroke telemedicine consultations in regional Victoria, Australia.² The Victorian Stroke Telemedicine Program provides a 24/7 hyperacute stroke care clinical service (n = 16 hospitals) via metropolitan-based neurologists.³ Neurologists participate, in addition to other clinical commitments, under a fee-for-service model. Challenges include on-call demands, working with unfamiliar regional systems and colleagues with varying clinical skills, technology-related issues, and lack of feedback on patient outcomes. Perceived benefits include improving equity of access to optimal stroke care and delivering medical education to regional colleagues.^{2,4} The reported challenges may include additional burnout factors, reducing career satisfaction; however, practicing telemedicine may moderate burnout risk and augment professional satisfaction via meaningful work.

With telemedicine proposed to improve access to neurologists,⁵ understanding telemedicine-specific factors for burnout and career satisfaction should be considered in future surveys.

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797–808.
2. Bagot KL, Cadilhac DA, Vu M, et al. Telemedicine in the acute health setting: a disruptive innovation for specialists (an example from stroke). *J Telemed Telecare* 2015;21:443–448.
3. Cadilhac DA, Moloczij N, Denisenko S, et al. Establishment of an effective acute stroke telemedicine program for Australia: protocol for the Victorian Stroke Telemedicine project. *Int J Stroke* 2014;9:252–258.

4. Bagot KL, Cadilhac DA, Hand PJ, Vu M, Bladin CF. Telemedicine expedites access to optimal acute stroke care. *Lancet* 2016;388:757–758. Letter.
5. Freeman WD, Vatz KA, Griggs RC, Pedley T. The work-force task force report: clinical implications for neurology. *Neurology* 2013;81:479–486.

© 2017 American Academy of Neurology

LETTER RE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Vaitsa Giannouli, Thessaloniki, Greece: Busis et al.¹ investigated the prevalence and factors that contribute to burnout, career satisfaction, and well-being in US neurologists. Within the last decade, there has been growing interest in considering factors defined at multiple levels in psychological and health research; multilevel analysis emerged as a way to partly address this need by allowing simultaneous examination of group-level and individual-level factors.² Given that doctors do not live in a social vacuum, without emotional, cognitive, and behavioral influences, but are active members of working groups with lead roles in health care organizations, a shift of methodology was proposed: multilevel analyses, when applied in burnout research, examine data from people in different groups but working in the same organization, and examine how they influence each other emotionally, by treating obtained data from the subordinates group as nested within actual data from their leaders.^{3,4} The choice of binary logistic regressions with only individual-level variables neglects the influence of other important variables on emotions and, thus, is restrictive.⁴ This is evident in findings that support that specific personality-related characteristics of doctors in charge of a hospital clinic predict better burnout than other demographic or individual-level variables.⁵

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797–808.
2. Diez-Roux AV. Multilevel analysis in public health research. *Annu Rev Public Health* 2000;21:171–192.
3. Giannouli V. What do we really know about hubris, culture and health professionals in leadership positions? A methodological recommendation. *Asian J Psychiatr* 2017;26:150–151.
4. Nezlek JB. An introduction to multilevel modeling for social and personality psychology. *Soc Personal Psychol Compass* 2008;2:842–860.
5. Giannouli V. Emotional Leadership in Health Care Units: Relationships of Leaders-Subordinates. Patras: Hellenic Open University; 2014. Available at: apothesis.eap.gr/handle/repo/27211. Accessed April 16, 2017.

© 2017 American Academy of Neurology

LETTER RE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Charles S. Yanofsky, Camp Hill, PA: I heard the excellent Presidential Plenary Address by Dr. Terrence Cascino at the 2017 American Academy of Neurology (AAN) meeting. The focus of the AAN on this issue, especially early retirement, is to be applauded, but the emphasis on work–life balance and yoga is misplaced. The term burnout is demeaning to our colleagues.

Busis et al.¹ found that physician dissatisfaction was widespread among neurologists, as mentioned in the title, conclusion, and article. Why not use its proper name, which is physician dissatisfaction syndrome, rather than burnout? My particular subgroup is composed of professionals who care deeply about practice and our patients. Dissatisfaction revolves around loss of autonomy and meaning, not work–life balance and yoga.

Many of these issues are touched on in the new book by Elisabeth Rosenthal, *An American Sickness*.² I suggest this book and others like it be reviewed and featured prominently.

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797–808.
2. Rosenthal E. *An American Sickness: How Healthcare Became Big Business and How You Can Take It Back*. New York: Penguin Press; 2017.

© 2017 American Academy of Neurology

LETTER RE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Joseph R. Berger, Philadelphia: The study by Busis et al.¹ of 1,671 US neurologist survey respondents revealed that burnout was common among all neurology practice settings and subspecialties. During Dr. Cascino's 2017 Presidential Plenary Address, he presented a figure from a larger survey of US physicians in general that correlated the percentage of physicians with burnout identified by specialty with the percentage satisfied with their work–life balance.² This graph seemed to indicate that neurology was among the specialties with the greatest degree of burnout and the least satisfaction with work–life balance.²

The multivariate analysis from the American Academy of Neurology study found that burnout was associated with autonomy, clerical tasks, support staff, and hours worked (among other factors).¹ In his presentation, Dr. Cascino suggested that there was nothing unique about neurologists that predisposed them

to burnout, but I propose otherwise. There are unique personality traits shared by neurologists that may, in large measure, be responsible for their increasing job dissatisfaction.

Although there appears to be no formal study of the neurologist's personality type, a Myers-Briggs Personality Inventory administered to nearly 100 neurologists at Johns Hopkins revealed that they were "highly analytical, organized and somewhat introverted intellectuals."³ The neurologist among all other specialists is the quintessential last physician-scientist generating hypotheses at the bedside while eliciting the patient's history and then testing the hypotheses, at least with respect to lesion location, with a detailed examination of the patient.⁴ These exercises can be time-consuming.

As the opportunity to spend time evaluating and ruminating about the patient is narrowed by other exigencies (e.g., demands for more relative value units, time required to input information in the electronic medical record, fighting with insurance companies), the neurologist's job satisfaction must, perforce, be affected. A unique personality may explain why neurologists experience job dissatisfaction that seemingly exceeds that of many other medical specialties.

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797–808.
2. 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;90:1600–1613.
3. Griffin JW. Training matters in neurology. *Nat Clin Pract Neuro* 2006;2:345.
4. Berger JR. Neurologists: the last bedside physician-scientists. *JAMA Neurol* 2013;70:965–966.

© 2017 American Academy of Neurology

LETTER RE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Nitin K. Sethi, New York: I read with interest the article on burnout among US neurologists.¹ There are 2 additional factors contributing to burnout that the authors fail to address. One is the electronization of medicine. Electronization is a term used to describe the process of taking an item or process from paper-based form and electronically producing it, mainly to increase profitability and efficiency. We now have electronic health records (EHR) available on laptop, iPad, and cell phone. Patients can email physicians through the myconnect portal on the EHR, contact physicians through work email, or, in some instances, text physicians on cell phones. Frequently, these calls

and emails are for nonemergency reasons, but since we are always connected, we are obligated to answer. One leaves the office or the hospital, but does not leave work behind. We are always on call. Doctors lost their right and battle to disconnect. Second, the authors mention the importance of implementing physician-friendly national policies that decrease regulatory burden but do not discuss the burden and stress on physicians caused by ever-increasing mandatory continuing medical education requirements and maintenance of certification requirements.

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797–808.

© 2017 American Academy of Neurology

AUTHOR RESPONSE: BURNOUT, CAREER SATISFACTION, AND WELL-BEING AMONG US NEUROLOGISTS IN 2016

Neil A. Busis, Pittsburgh; Tait D. Shanafelt, Rochester, MN; Christopher M. Keran, Minneapolis; Kerry H. Levin, Cleveland; Heidi B. Schwarz, Rochester, NY; Jennifer R. Molano, Cincinnati; Thomas R. Vidic, Elkhart, IN; Joseph S. Kass, Houston; Janis M. Miyasaki, Edmonton, Canada; Jeff A. Sloan, Rochester, MN; Terrence L. Cascino, Rochester, MN: We thank Bagot et al. for their comments. Burnout, career satisfaction, and well-being in neurologists who practice telemedicine is important to study as this practice model becomes more common.

We surveyed neurologists who mostly practice fee-for-service face-to-face medicine, modified to meet value-based programs mandated by US Centers for Medicare and Medicaid Services, and others. Telemedicine was not a choice for our questions on primary work setting and primary types of patients seen.¹

Telemedicine is one of many practice models emerging during the transition from volume- to value-based reimbursement.^{2–4} The success of all models depends on timely access to care and optimal provider performance. Physician burnout, career satisfaction, and well-being will continue to be critically important during health care transformation.

We anticipate that each new practice model will have aspects affecting neurologist burnout, career satisfaction, well-being, and engagement. However, the balance of pros and cons, which may differ for different neurologists, is not yet known for any of the new models.

Our survey was designed to facilitate comparison between different physician groups by using instruments validated in previous studies of other medical specialties. It can be adapted to study neurologists practicing under newer health care delivery and payment models, including telemedicine.

We agree with Dr. Giannouli that neurologists do not work in a social vacuum; neurologists' practice context may influence burnout, career satisfaction, and well-being.

We asked neurologists about their practice characteristics including geographic location, primary work setting, employment status, and compensation method.¹ None of these factors was associated with burnout or profession satisfaction using multivariable analyses. We did not ask about neurologists' relationships with their supervisors, colleagues, or support staff. We also did not ask about the hierarchical level of individuals within their organization or what roles they played on the care team.

Some of us previously studied the effect of organizational leadership on physician burnout and satisfaction⁵ and the association between physician burnout and changes in professional work effort.⁶ These studies demonstrated a powerful effect of the practice environment on individual physicians and networks of physicians, but were carried out in a single large health care organization, which facilitated this type of analysis.

Future studies exploring the effects of neurologists' practice frameworks on burnout, career satisfaction, and well-being using multilevel analyses may yield valuable insights. To perform such analyses, we would need information on where neurologists worked, so we could identify those in the same work unit/organization.

We thank Dr. Yanofsky for the comments. Burnout has been a well-defined construct for over 40 years and has been evaluated in all types of workers, including extensive research in physicians.¹ There are well-validated tools to assess this syndrome, which is shown to predict important personal and professional outcomes across a range of professions. To our knowledge, physician dissatisfaction syndrome is not a well-defined construct and we found no results for this term in a Google search.

The drivers of burnout are also well-defined and include workload, efficiency, meaning in work, autonomy/flexibility, and work-life integration, among others.⁷ Both personal and organizational factors contribute to each of these dimensions. Accordingly, addressing physician burnout is the shared responsibility of individual physicians, health care organizations, and a host of national stakeholders (e.g., payers, regulators, licensing boards, professional societies).⁷

Dr. Berger proposes that unique personalities lead to job dissatisfaction. The Myers medical study classified neurologists into 4 personality types.⁸ All were shared by other specialties. Psychiatrists overlapped with neurologists in 3, yet psychiatrists are among specialties with the highest work-life balance

satisfaction and the lowest burnout rates.⁹ It is unlikely that a neurology personality type is a primary burnout driver.

We, and others,¹⁰ agree that successfully practicing neurology depends on a more thorough history and physical examination than many other specialties. Electronic health records (EHRs) were designed for primary care physicians. It is difficult to enter a complete and accurate neurologic history and examination into an EHR and to review electronic records from colleagues. Our diagnostic tests and treatments can be costly, necessitating burdensome administrative tasks if our patients are to receive the care they need.

Physicians' dissatisfaction with their clerical burden and their electronic practice environment is a burnout driver.¹¹ Neurology was among the specialties with the greatest prevalence of burnout and the lowest rate of satisfaction with clerical burden.

The high prevalence of neurologist burnout may be due to misalignment of the neurologic method with the current health care environment.

We thank Dr. Sethi for the comments. Our survey included 2 questions addressing contributions of EHRs and maintenance of certification (MOC) to neurologist burnout:

1. "The amount of time I spend on clerical tasks directly related to patient care is reasonable," defining "directly" as order entry, dictation, laboratory results review, and communicating with patients via a patient portal. This includes EHRs.¹
2. "The amount of time I spend on clerical tasks indirectly related to patient care is reasonable," defining "indirectly" as correspondence, completion of forms, and answering phone calls. This includes MOC.¹

Clerical burden, EHRs, and computerized order entry are associated with physician burnout.¹¹ Neurology is among the specialties with the greatest burnout prevalence and the lowest satisfaction rate with clerical burden directly related to patient care.

For every hour physicians provide direct clinical care, 2 additional hours are spent on EHR and other administrative tasks during the work day. Physicians spend 1 to 2 hours doing additional computer and clerical work each night.¹²

MOC is viewed negatively by most physicians. However, in a recent national survey, there was no association between attitudes towards MOC and burnout.¹³

We need evidence-based health care policies, jettisoning administrative tasks that do not add value.¹⁴

1. Busis NA, Shanafelt TD, Keran CM, et al. Burnout, career satisfaction, and well-being among US neurologists in 2016. *Neurology* 2017;88:797-808.

2. Hoch DB, Homonoff MC, Moawad H, et al. The neurologist as a medical home neighbor. *Neurol Clin Pract* 2013; 3:134–140.
3. Satya-Murti S, Busis NA. Chronic care management codes: a small step in the right direction. *Neurol Clin Pract* 2015; 5:371–373.
4. Busis NA, Franklin GM. The AAN's Axon Registry: mastering how we are measured. *Neurology* 2016;87:2180–2181.
5. Shanafelt TD, Gorringer G, Menaker R, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc* 2015;90:432–440.
6. Shanafelt TD, Mungo M, Schmitgen J, et al. Longitudinal study evaluating the association between physician burnout and changes in professional work effort. *Mayo Clin Proc* 2016;91:422–431.
7. Shanafelt TD, Dyrbye LN, West CP. Addressing physician burnout: the way forward. *JAMA* 2017;317: 901–902.
8. McCauley MH. The Myers Longitudinal Medical Study: Prepared as Part of the Final Report, Contract No. 231-76-0051: "Application of the Myers-Briggs Type Indicator to Medicine and Other Health Professions." Gainesville, FL: Center for Applications of Psychological Type; 1977.
9. 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;90:1600–1613.
10. Bernat JL. How can neurologists avoid burnout? *Neurology* 2017;88:726–727.
11. 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;91:836–848.
12. 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;165:753–760.
13. Cook DA, Blachman MJ, West CP, Wittich CM. Physician attitudes about maintenance of certification: a cross-specialty national survey. *Mayo Clin Proc* 2016;91:1336–1345.
14. Erickson SM, Rockwern B, Koltov M, McLean RM; Medical Practice and Quality Committee of the American College of Physicians. Putting patients first by reducing administrative tasks in health care: a position paper of the American College of Physicians. *Ann Intern Med* 2017;166:659–661.

© 2017 American Academy of Neurology

CORRECTION

Increased brain-predicted aging in treated HIV disease

The Open Access status of the article "Increased brain-predicted aging in treated HIV disease" by J.H. Cole et al.¹ has been rescinded and American Academy of Neurology copyright has been added.

REFERENCE

1. Cole JH, Underwood J, Caan MWA, et al. Increased brain-predicted aging in treated HIV disease. *Neurology* 2017; 88:1349–1357.

Author disclosures are available upon request (journal@neurology.org).

Neurology®

Increased brain-predicted aging in treated HIV disease

Neurology 2017;89:1652

DOI 10.1212/WNL.0000000000004408

This information is current as of October 9, 2017

Updated Information & Services

including high resolution figures, can be found at:
<http://n.neurology.org/content/89/15/1652.full>

References

This article cites 1 articles, 1 of which you can access for free at:
<http://n.neurology.org/content/89/15/1652.full#ref-list-1>

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
http://www.neurology.org/about/about_the_journal#permissions

Reprints

Information about ordering reprints can be found online:
<http://n.neurology.org/subscribers/advertise>

Neurology® is the official journal of the American Academy of Neurology. Published continuously since 1951, it is now a weekly with 48 issues per year. Copyright © 2017 American Academy of Neurology. All rights reserved. Print ISSN: 0028-3878. Online ISSN: 1526-632X.