

Qualitative study of burnout, career satisfaction, and well-being among US neurologists in 2016



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ABSTRACT

Objective: To understand the experience and identify drivers and mitigating factors of burnout and well-being among US neurologists.

Methods: Inductive data analysis was applied to free text comments (n = 676) from the 2016 American Academy of Neurology survey of burnout, career satisfaction, and well-being.

Results: Respondents providing comments were significantly more likely to be older, owners/partners of their practice, solo practitioners, and compensated by production than those not commenting. The 4 identified themes were (1) policies and people affecting neurologists (government and insurance mandates, remuneration, recertification, leadership); (2) workload and work-life balance (workload, electronic health record [EHR], work-life balance); (3) engagement, professionalism, work domains specific to neurology; and (4) solutions (systemic and individual), advocacy, other. Neurologists mentioned workload > professional identity > time spent on insurance and government mandates when describing burnout. Neurologists' patient and clerical workload increased work hours or work brought home, resulting in poor work-life balance. EHR and expectations of high patient volumes by administrators impeded quality of patient care. As a result, many neurologists reduced work hours and call provision and considered early retirement.

Conclusions: Our results further characterize burnout among US neurologists through respondents' own voices. They clarify the meaning respondents attributed to ambiguous survey questions and highlight the barriers neurologists must overcome to practice their chosen specialty, including multiple regulatory hassles and increased work hours. Erosion of professionalism by external factors was a common issue. Our findings can provide strategic direction for advocacy and programs to prevent and mitigate neurologist burnout and promote well-being and engagement.

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GLOSSARY

AAN = American Academy of Neurology; **ABPN** = American Board of Psychiatry and Neurology; **CMS** = Centers for Medicare and Medicaid Services; **EHR** = electronic health record; **MOC** = Maintenance of Certification.

Physician burnout is characterized by depersonalization, emotional exhaustion, and low sense of accomplishment.^{1,2} Well-being comprises complex interactions of positive and negative determinants of mental, emotional, and physical health.³⁻⁵ A recent study found that 60% of US neurologists had at least one symptom of burnout. Neurologists had lower rates of career satisfaction and well-being compared to many other medical specialties.^{1,2,6}

Physician burnout research has explored physician-centric factors including self-care, resilience, time management, and personality.⁷⁻⁹ More recently, external factors have emerged as major determinants of burnout.¹⁰⁻¹⁴ Physician burnout is associated with poorer quality health care and patient satisfaction and decreased access to care due to physicians reducing work hours or leaving clinical positions.^{12,15-17}

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Supplemental data
at Neurology.org

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Qualitative research is a well-established method to systematically analyze interview or survey comments to characterize respondents' experiences, observations, and opinions and determine common underlying themes.^{18–20} Qualitative research complements quantitative survey data by providing context to the numbers. These methods enable researchers to understand the meaning respondents attribute to potentially ambiguous survey questions. When a large amount of qualitative data is analyzed, researchers can saturate a theme to understand a phenomenon from the subjects' perspective.^{18–21}

We sought to better understand the results of a survey of US neurologists designed by the American Academy of Neurology (AAN) to assess burnout, career satisfaction, and well-being by using qualitative methods to analyze respondents' free text comments entered into the survey.⁶

METHODS Study population. Population sampling and quantitative data collection were described in Busis et al.⁶ The study population was current practicing neurologist members of the AAN with a primary address in the United States. The response rate was 40.5% (1,671/4,127). The survey concluded with an open-ended question: "Is there anything else you would like to share with AAN regarding burnout and well-being?" Characteristics of those who provided comments vs those who did not comment are provided in table e-1 at [Neurology.org](#).

Standard protocol approvals, registrations, and participant consents. Completing the survey was implied consent to participate in the study. After the anonymized data were provided to the AAN by Anderson, Niebuhr & Associates, Inc. (Minneapolis), the study was reviewed and granted exempt status by the University of Pittsburgh institutional review board.

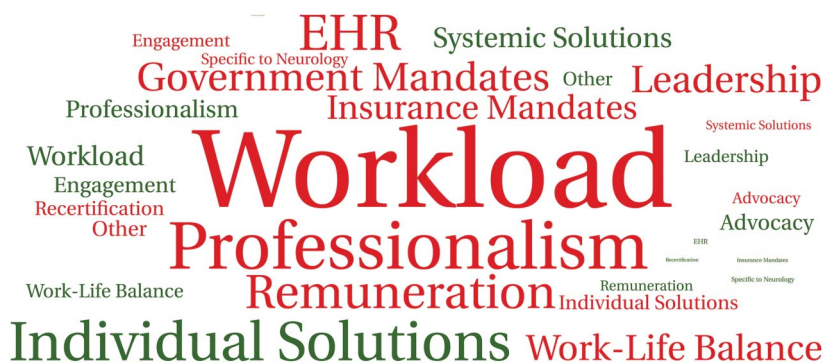
Qualitative analysis methodology. A panel of 5 neurologists and 3 non-neurologists was assembled. Free-text responses (n = 676) were collected for analysis. Each statement could be relevant to multiple themes so the total number of text units is >676. Following the qualitative framework described by Creswell,¹⁸ we used inductive data analysis to understand the participants' meaning of burnout.²¹ Using NVivo Pro 11 software, panelists coded comments in an iterative process and identified themes with each round further clarifying theme definitions. Resulting themes were triangulated and validated with quantitative data.⁶ A codebook of theme definitions was developed and agreed upon by all panelists. Seven panelists tested the codebook by coding 40 random statements. Disagreements in coding were resolved through discussion and consensus resulting in precise theme definitions. Seven panelists used the revised codebook to code the same 40 statements (table e-2). Four panelists with close agreement in coding (2 neurologists, 2 non-neurologists with expertise in qualitative methods) were divided into 2 teams (each consisting of a neurologist and non-neurologist), which coded 338 comments. The resulting analysis was further validated by 5 other panelists using member checking and triangulation with quantitative data. The 15 themes were organized into 4 related overarching themes. To provide a visual context, a word cloud was generated with font size proportional to the number of comments (green: positive, red: negative; figure).

RESULTS Demographics of qualitative respondents.

Of 1,671 survey respondents, 676 provided comments (excluding "No," "NA," or a signature [n = 33, table e-1], or were not currently in practice [n = 3, table e-3]). Respondents providing comments were significantly older, more likely to be owners or partners of a practice or in solo practice, and more likely to be compensated based on patient/procedure volume (table e-1).

Qualitative themes. Four overarching themes emerged from the 15 identified themes (figure): (1) policies and people affecting neurologists (government mandates, insurance mandates, remuneration, recertification, leadership); (2) workload and work-life balance

Figure Word cloud illustrating our results



The size of each word reflects the number of comments about that theme. Positive comments are green. Negative comments are red. The most numerous comments were negative remarks about workload. Government mandates, insurance mandates, recertification, electronic health record, specific to neurology had so few positive comments that these themes are unreadable in this figure at this resolution. A higher resolution image of this figure is available at [Neurology.org](#).

(workload, electronic health record [EHR], work–life balance); (3) engagement, professionalism, and work dimensions specific to neurology (same titled themes); and (4) solutions, advocacy, and other (same titled themes). Negative comments regarding workload were most frequent. Representative quotes are presented in tables 1–4 and table e-4 and are summarized below.

Group 1: Policies and people affecting neurologists.

Government mandates (135 text units). Government mandates included government policies and requirements by Centers for Medicare and Medicaid Services (CMS) (table 1). Neurologists specifically referenced CMS, EHR Meaningful Use incentive program, and Physician Quality Reporting System as regulatory hassles significantly increasing documentation requirements and increasing physicians' (nonreimbursable) time spent meeting these requirements. Respondents stated that regulations did not benefit patients but reduced direct patient care time and increased practice costs. The lone positive comment stated that recent Drug Enforcement Agency criteria

reduced drug-seeking by patients, which improved the respondent's practice.

Insurance mandates (142 text units). Insurance mandates included paperwork, preauthorization, phone calls, peer-to-peer consultations, or any time spent by support staff or neurologists to access care for patients. Neurologists described insurance mandates as “precertification of everything.” Further, peer-to-peer consultation was not with a doctor with neurology expertise. Insurance companies seemed to dictate patient treatment and investigation rather than physicians, and the preauthorizations seemed like pointless busywork since after many layers of phone calls, the test or treatment was often approved. Neurologists thus felt they were fighting daily with insurance companies to protect their patients, but without recognition for their persistence.

Remuneration (203 text units). Neurologists felt underpaid compared to other specialties based on the difficulty of their work and the time required for patient care since Evaluation and Management visits are a large part of neurology and are less

Table 1 Group 1: Policies and people affecting neurologists

Theme	Descriptive examples
Government mandates	The amount of nonpatient care requirements, primarily government and insurance company generated idiocy, which so detracts from the ability to spend time caring for my patients that prevents the practice of neurology from being satisfying.
	My younger generation is burning out, they are frustrated with the “meaningless use” documentation taking away from patient care.
	There is also more time devoted to the medical record to track “outcome data” but mainly to justify reimbursement.
Insurance mandates	I am also increasingly spending much of my time writing preauthorizations and making “peer to peer” phone calls for insurance authorizations for treatments or MRI. I sometimes go through 3 or 4 layers before I get approved. I am almost never denied, but they all seem to deny the initial request.
	Another significant factor in physician burnout is the control of all aspects of patient care wielded by insurance companies. As a physician, I can only recommend or request a diagnostic test or medication since the ultimate decision will be made by the insurance company.
	The most frustrating aspects include authorization of most treatment recommendations...constantly defending patients from insurers and health plans and politicians attacking and blaming physicians.
	I'm tired of constantly being challenged for what I order for my patients.
	Insurance company executives are dictating patient care rather than physicians. I feel less control over the care I give to patients.
Remuneration	The new compensation models, which are driven by patient scores or “performance,” are very onerous and will likely lead to more burnout.
	All multiple sclerosis centers lose money on patient care (for me, previously \$50,000 loss annually)...This is due to poor reimbursement for very long visits, as well as staff and personal time with insurance companies.
	Cut in EMG payments has caused all this. 95 hours/week 52 weeks a year.
	Spending more and more time at work and receiving less and less money.
Recertification	I spend more than 15 hours (additional hours) per week for [preauthorizations] and sending records. Unreimbursable time. Yesterday, an hour to save a patient \$20—not what I went to med school for.
	One has to keep up with documenting CMEs for various offices at various times throughout the year for hospital credentials, ABPN boards, and state boards. Now we need to track PIPs and self-assessment CMEs. I have 3 board certifications that expire on 3 different years that need every 10 years exams for continued certification.
Leadership	I agree we need mandatory updates. They can be done by well-planned mandatory conference every few years.
	Legions of administrators...spend their days in meetings to further commodify medicine, to squeeze maximal revenue from every patient encounter.
	Impudent business culture and values ...are relentlessly supplanting medical culture and values.
	The [medical assistant] who “rooms” my patients...calls me a “provider” to my face.
	I feel fortunate to have a chief and new local administrator who is fighting this trend somewhat.

Abbreviations: ABPN = American Board of Psychiatry and Neurology; CME = continuing medical education; PIP = performance in practice.

remunerative compared to procedures. Reduced compensation for EMG and nerve conduction studies particularly affected neurologists' remuneration. External factors such as nonremunerative time spent with preauthorizations for insurance companies and complying with government mandates reduced income.

Recertification (66 text units). The American Board of Psychiatry and Neurology (ABPN) requires that certified neurologists conduct ongoing education and self-assessment and take a formal examination every 10 years to maintain the designation as an ABPN-certified neurologist. Neurologists cited the recertification process, Maintenance of Certification (MOC), as a source of stress and financial burden. Many neurologists were not convinced that MOC improved patient care.

Leadership (169 text units). Leadership included local/institutional leaders or administration and could include physician leaders. Neurologists described administrators as focused on profits over patient care, continually forcing neurologists to see more patients, do more procedures, and take on additional call or administrative duties without compensation, and sometimes threatened their jobs if they did not perform added duties. These actions reduced ability to provide quality care, conduct research, and teach or spend time outside of work, and reduced neurologists' autonomy and recognition of their

professionalism. A few neurologists mentioned outstanding leadership at their institution significantly reduced their burnout by supporting work-life balance and recognizing neurologists' contributions.

Group 2: Workload and work-life balance. Workload (522 text units). Workload was defined as both direct patient care and work not related to patient care that other staff could perform (table 2). Multiple factors contributed to excessive workload, including lack of sufficient numbers or skills of support staff due to hospital cutbacks or poor neurology remuneration, increased computer work, insurance and government mandates, reduced neurology workforce, and increased patient volumes. As a result, neurologists spent less time in direct patient care and often felt that their labor did not improve patient outcomes.

Electronic health record (160 text units). Neurologists uniformly stated the ideal EHR should save physicians time, allow them to focus on patient care, and facilitate medical record sharing. In practice, they reported EHRs resulted in extra clerical work for physicians and decreased quality of doctor-patient interactions. Several estimated working 2 or 3 additional hours/day since EHRs were introduced. Information was hard to find, notes were often "copied forward" and therefore of dubious utility, and multiple "clicks" were necessary to complete a visit. The majority of neurologists experience EHRs as

Table 2 Group 2: Workload, electronic health record (EHR), and work-life balance

Workload	The specialty of neurology should be recognized as needing more staff support given its requirement for intense attention to detail and extremely complex and individualized care.
	I'm fed up doing clerical work at the expense of patient contact.
	The staff increasingly has trouble figuring out how to navigate the maze [created] by pushback from insurance companies on tests and medications.
	I feel like a data entry clerk.
	Many clerical tasks have been downloaded to us.
	I accepted this job because it seemed reasonable when compared with small private practices. They usually ask (15+) daily outpatient x5 full day and inpatient coverage. I am not fully burned out yet!
EHR	I don't have an EHR and don't see they help patients or me. When I read other doctors' EHR—I find it hard to find key data—like the chief complaint, history Rx, and treatment plan. What a racket.
	I'm a high-priced transcriptionist.
	No longer do I practice meaningful medicine. Being a doctor, I'm a transcriptionist, secretary: I'm more worried about point-and-click.
	The single most wearing aspect of practice is the EMR. The need to skim through huge amounts of irrelevant data...to proofread and correct...to code, to line up precisely medications with diagnoses—these add empty exhausting hours to the working day.
	The EHR is useful for bean counter but has done nothing to improve medical practice/patient care and is very destructive to the doctor/patient relationship.
Work-life balance	I have noticed that in recent years I have lost out on the ability to do the finer things in life, like listening to music, enjoying the arts, and having time to be creative. I am working at work and at home, always "catching up."
	Patients with complex neurologic conditions need a lot of time. I am expected to see follow-ups in 15 minutes. It is taking a toll on my health because I don't have time to exercise or cook healthy foods. Taking a toll on my family, I can't spend enough time with my kids and wife.
	I am 70% time to allow for time to address family needs. However, I need much of my "days off" to catch up on charting, prescribing, emailing/calling families, administrative responsibilities, and anything remotely academic. This is to the point that I am strongly considering leaving clinical practice.
	I'm going to take my laptop home, eat dinner, put my kid to bed and then sign notes until it's time for me to go to bed and then I will wake up in the morning and do the whole thing over again.

administrative or clerical burdens rather than patient quality care tools.

Work-life balance (169 text units). Neurologists reported poor work-life balance. Clerical tasks and documentation for insurance and government mandates required expanded work hours or were completed at home so neurologists could spend sufficient time with their patients providing care. Family life suffered, and hobbies fell by the wayside. Even reducing work hours to address family needs was undermined by ever-expanding work tasks infringing on “time away from work.”

Group 3: Engagement, professionalism, and work dimensions specific to neurology. Engagement (138 text units). “Vigor, dedication, and absorption in work” describes engagement.^{22,23} Many neurologists were less curious about neuroscience, enjoying the practice less and enjoying life less (table 3). Those retaining engagement acknowledged the challenge of practice and exhaustion, yet found neurology rewarding and retained a sense of accomplishment.

Professionalism (304 text units). Professionalism included individual professional behaviors and overall treatment of physicians as professionals by others. Some neurologists maintained a sense of mission and purpose to avoid burnout. Many reported they did not feel like physicians but “just one more worker bee in a swarm,” and a “cog in a wheel” by their organizations, administration, government, or insurance companies. Self-monitoring is important in

professionalism. Many respondents self-identified burnout and changed their work situation (reducing work hours or stopped being on-call) to address burnout.

Work dimensions specific to neurology (55 text units). Neurologists described their practices as emotionally taxing and not well understood or respected by colleagues, management, or policymakers. The lack of understanding resulted in lower reimbursement and demands for shorter appointments, undermining the work of diagnosing complex conditions and providing ongoing care for patients with debilitating diseases. Neurologists also described frustration due to demands by administration to see patients outside their subspecialty or patients who could be treated by primary care physicians were it not for perceived defensive medical referrals. Many were concerned about the current and future neurology workforce being inadequate to meet the needs of an aging society.

Group 4: Solutions, advocacy, and other. Systemic solutions (135 text units). Neurologists stated that measures to reduce EHR and insurance mandate time, increase time for direct patient care, and improve reimbursement for cognitive specialists would reduce burnout (table 4). Neurologists specifically stated that adequate pay for night call, resources to help negotiate with “corporate medicine interests,” and improved remuneration to allow hiring adequate numbers of skilled staff and advance practice providers would

Table 3 Group 3: Engagement, professionalism, and work dimensions specific to neurology

Engagement	About 4 years ago, I began going through a severe burnout. I recognized it. I could find no help for it. I informed my boss, asked repeatedly for help, got nothing in return. It improved somewhat, but now is leading to my wanting desperately to leave this profession, which I will do over the next few months.
	HIPAA, the Affordable Care Act, ICD coding in general, and insurance hassles combined with the media and our own industry brainwashing patients into complaining consumers that think they should always get another test, a new drug, and will get well because of medical advances has sucked all the fun out of this job.
	My oxygen is my colleagues and my intellectual curiosity.
	It gets very old after a while and I have probably been burnt out for the last few years—waxes and wanes but this is simply a job at this point—not a career.
	Rather than “burning out” I had the opportunity to “blaze up” in a more rewarding and satisfying position.
Professionalism	If I spent my entire time examining and treating patients, I would not feel burned out at all. The gratitude I get from directly feeling that I made a positive impact in patients’ lives gives me a feeling of exhilaration.
	What keeps me going is the sense of service, when in the middle of the night, in the ED; I am with a patient whom I can help and whose life I can help for the better.
	I stopped all hospital-based practice including consultations because of burnout.
Work dimensions specific to neurology	I feel lucky that I have a profession, which I love, and with which I feel I can make a difference in people’s lives.
	“Physicians have become highly overpaid proletarian labor.”
	Neurology has become the junk heap of medicine. Most practitioners (MD, PA, NP) dump anything that smells of the nervous system on neurologists. They make no attempt to even try to deal with the most mundane problems; for example, migraines. Some even refer for prescription refills in stable patients... Sometimes I feel I am practicing neuro-junk-ology.
	I would point to an inextricable constant in the clinical neurologist: the time-intensive requirement for an accurate diagnosis.
	The amount of time required of each patient, the complexity of the majority of patients seen, the lack of ability to generate “extra” income to offset income loss... and the lack of recognition within medicine of the value of neurologists.

Abbreviations: HIPAA = Health Insurance Portability and Accountability Act; ICD = *International Classification of Diseases*.

Table 4 Group 4: Solutions, advocacy, and other

Solutions at a systemic level	My sources of burnout: Physician Quality Reporting System, EMR Meaningful Use, E/M Coding/ICD-10, low Medicaid reimbursements, hospital administration concentrating on length of stay rather than diagnosis and treatment. All sources of stress that challenge the next generation of neurologists & <i>make me feel like advising young people not to go into medicine as a career.</i> [italics by study volunteer]. I do not believe that physicians require more "skills" for managing burnout, but rather there needs to be a restructuring of the health care system that is more supportive of physicians in their goal to care for patients. My biggest stress continues to be "on-call," which is getting more complex and stressful over time. I believe the biggest stress and dissatisfaction for neurologists and any specialist is being on call, which is not credited as work time, and there is no appropriate compensation. This needs to be addressed. We need this "call" time recognized as work and appropriate compensation addressed. There is a gross shortage of neurologists practicing in nonacademic community practice. A great deal of burnout stems from having too many patients to see. A possible solution might be to encourage and enable young graduates to seek careers in community rather than academic practice. It is every bit as interesting and the pay is better.
Solutions at an individual level	Please get rid of the recertification exam, it does not weed out bad neurologists (as they pass the boards the first time). Make it either CME/self-assessment/PIP and patient safety or the boards, not both; this contributes to burnout. I am drowning and while I love seeing patients, all of the other aspects such as insurance authorization and figuring about medications have made me want to look into nonclinical consulting to reduce the burden of what it really means to care for patients. I feel tremendously burned out and I am actively looking for a way out of my full-time academic clinical practice. I chose my practice (balanced) after reaching a point of burnout and I have regained a love and passion for neurology. I do not want future neurologists burning out before their careers begin. This is a growing topic and needs attention nationally. I significantly restructured my career to increase my job satisfaction. (I switched to inpatient only as a neurohospitalist and began to work part time. I also discontinued research and administrative time and relieved my teaching responsibilities.) My only option was to leave the field I loved in order to survive in my profession until I could retire.
Advocacy	The AAN needs to push back against regulations that have no proven benefit to patients that are foisted upon us, Meaningful Use and need to use EMR along with recertification requirements being prime examples. These unfounded mandates with no proven benefits are an enormous stress on practitioners. Need more focus at the national level to provide guidance regarding how to negotiate with corporate medicine interests without losing existential values/core beliefs about the role as a physician. We are a "stealth" specialty. We need more visibility. We need more advocacy with CMS and other government agencies to demonstrate the positive impact of access to neurology care on patient outcomes. Neurologists make close to what GPs make. We are grossly underpaid for our unique knowledge and specialized skills. AAN should fight to get us up to the level of cardiologists! We see a lot of the same patients, such as vascular disease, syncope. I think that at the core, neurologists are burnt out because they do not feel adequately respected and reimbursed for choosing one of the most challenging and dynamic specialties in medicine. We feel that the deck is stacked against cognitive specialists such as neurologists in favor of the proceduralists/surgeons.
Other	Brainwashing patients into complaining consumers that think they should always get another test, a new drug, and will get well because of medical advances has sucked all the fun out of this job. There is no money and too much red tape for small research projects. Physicians should have more exposure to developing leadership skills and have access to management courses... this will enable them to effectively lead their practice, manage policy, personnel, and finances rather than have to depend on nonphysician administrators in leadership roles.

Abbreviations: AAN = American Academy of Neurology; CME = continuing medical education; E/M = evaluation and management; EHR = electronic health record; GP = general practitioner; ICD = *International Classification of Diseases*; PIP = performance in practice.

improve burnout. Many expressed concerns about the neurology workforce, including the need to mentor students to encourage entry into neurology.

Individual solutions (246 text units). Neurologists shared how they successfully reduced burnout: decreasing work hours, gaining autonomy over their schedule, retiring early, or quitting practice. Many changed practice: leaving academics or joining it; leaving the Veterans' Administration or joining it. No one started a solo practice as a solution. A few reported that subspecialization was helpful to increase their sense of mastery over a clinical area and accomplishment in improving patients' lives.

Advocacy (121 text units). Advocacy was defined as what physician organizations or associations should do on behalf of neurologists and patients. Neurologists wanted the AAN to represent their interests at the federal level, describing lower reimbursements for

neurology procedures, lack of reimbursement for cognitive services, and dropping incomes as the responsibility of AAN. Neurologists wanted the AAN to advocate for relief of regulatory burdens and insurance mandates and moderate the ABPN influence on recertification. Several expressed dissatisfaction with all physician associations representing their interests.

Other (159 text units). Comments that did not fit in other themes were included here and included opinions about burnout fluctuating over time, perhaps reducing with age as mastery over neurology and associated administrative tasks increased. A few noted that burnout involved the pressures of being a neurologist and trying to balance family commitments including care of elderly parents. Several commented that their children did not pursue a career in neurology or medicine due to observing the effects of the profession on their parents.

DISCUSSION Quantitative analysis of results of a survey of US neurologists provided a high-level overview of factors associated with neurologist burnout, career satisfaction, and well-being and why neurology fares poorly compared to other specialties.^{1,2,6} The survey used validated instruments and was relatively short to encourage completion. Qualitative analysis of free text comments enhanced our understanding of the quantitative results. The figure provides a graphic summary of our findings. Workload (both clinical and clerical) is the most frequently cited burden for neurologists.

Neurologists reported increased patient caseload due to reduced remuneration resulting in longer work hours and encroachment on time at home. In addition, neurologists were significantly less likely to be satisfied with time spent on clerical tasks directly (23.0% vs 37.2%) and indirectly (15.9% vs 25.6%) related to patient care compared with other physicians.^{1,2,6} Clerical workload, EHR, and insurance and government mandates were often mentioned together as burdens that were not directly related to patient care, reduced direct patient time, and did not improve patient outcomes.

Neurologists specifically mentioned EHRs as increasing their burnout due to reduced time with patients and neurologists' enjoyment of clinical care without clear patient benefit. These views confirm other physicians' perspectives that more time is spent with the virtual patient (EHR) than the actual patient.²²⁻²⁵ Relying on "chart biopsies" without a thorough history and physical examination to provide "clinical context" resulted in additional laboratory tests and radiologic procedures, increasing health care delivery cost.^{24,25} A time and motion study found that only 27% of time was spent with patients in the examination room, 49.2% spent on EHR and desk work, and an additional 1.5 hours each day was spent at home on EHR.²¹ Physicians with documentation support (dictation or documentation assistant) spent significantly more time with direct clinical work.

Professionalism is a major theme arising in this study. Neurologists overwhelmingly felt their professional identity was undermined by systemic factors, resulting in disempowerment. Respondents felt like "worker bees" due to the clerical workload and this was reinforced by being called provider rather than doctor. Insurance companies treated neurologists' clinical judgment as less worthy than a bureaucrat's review of requests for tests and treatments. Neurologists felt policymakers did not value management of chronic conditions, resulting in poor reimbursement for this skill. Even physicians' schedules were dictated by administrators, further reducing autonomy, an important aspect of professionalism. The erosion of professionalism through these external forces

contributes to burnout by disempowering neurologists, reducing their sense of accomplishment, and devaluing their knowledge and skills. Interventions have specifically targeted enhancing professionalism to reduce burnout on a long-term basis.²⁶

Neurologists responded to burnout by reducing duty hours, removing themselves from being on-call, or early retirement. Solo practitioners were closing their practices and some transitioned to hospitalist or locum tenens work, often without taking call. These mitigation strategies are reported in other studies and specialties.^{3-5,27,28} While respondents subsequently reported less burnout, many were conflicted about being less available to patients or leaving subspecialties they loved. These strategies are concerning at the system level since they would lead to neurology workforce reduction, decreasing patient access to neurologic care.

Our findings are consistent with recent work suggesting much burnout is driven by external, system-wide factors.^{27,29,30} Increasing physician autonomy and enhancing physician engagement through meaningful involvement in organizational decision-making are more likely to prevent or mitigate burnout than interventions that focus on individual physicians (yoga studios in hospitals, time management courses).^{26,27,29,30} The American College of Physicians advocates reducing administrative tasks to put patients first and for physicians to be involved in the process to eliminate, streamline, and align administrative tasks with patient- and family-centeredness, quality improvement, and care delivery.³¹ Our results support these recommendations.

Our study is subject to several limitations. Analysis was based on responses to a single, open-ended question. The survey was cross-sectional and therefore unable to determine if respondents' comments vary over time. Respondents providing comments differed from those who did not (more likely to be older, owners or partners of a practice, in solo practice, and compensated based on patient/procedure volume) and therefore may not be representative of all neurologists. For example, previous investigators found older physicians were less likely to report distress and burnout than younger physicians, an observation attributed to experience, mastery, and change in work conditions.³² The effect of participants' degree of burnout is not known since burnout is a spectrum rather than a dichotomous state and comments were not analyzed by the degree of burnout.

Our study has important strengths. Our mixed-methods survey had a high participation rate relative to other national studies of physicians.^{1,2,5,6} The neurologists in the sample were drawn from the AAN member database, which includes most US neurologists. Neurologists with a wide range of personal and

practice characteristics responded. The large number of comments clarified ambiguities in certain survey questions, added context, and enhanced insights into relationships among the factors determined by the quantitative results that were associated with neurologist burnout, career satisfaction, and well-being.

Future research could use focus groups to validate and extend our findings and explore variability of burnout, well-being, and career satisfaction over time. Understanding the consequences of physicians reducing hours, removing themselves from on-call provision, or changing to other types of practice (remote monitoring, telemedicine, telestroke) is essential to workforce planning and appraising constraints on the future role of our specialty in health care. Research on burnout among neurology trainees and those in the first decade of practice may also help with physician workforce retention.

Our results further characterize burnout among US neurologists by using the respondents' own voices. They clarify the meaning respondents attributed to potentially ambiguous survey questions such as clerical work, and highlight the barriers neurologists must overcome to practice their chosen specialty, including multiple regulatory hassles and the perceived loss of professionalism. Our findings can help guide health care policy and provide strategic direction for advocacy and programs to prevent and mitigate neurologist burnout and promote well-being and engagement.³²⁻⁴⁰

AUTHOR CONTRIBUTIONS

Janis M. Miyasaki: design of the study, coding, codebook development, validating analysis and interpretation of the data, drafting and revising the manuscript for intellectual content. Carol Rheume: design of the study, coding, codebook development, analysis and interpretation of the data, drafting and revising the manuscript for intellectual content. Lisa Gulya: design of the study, coding, codebook development, analysis and interpretation of the data, drafting and revising the manuscript for intellectual content. Aviva Ellenstein: design of the study, coding, codebook development, validating coding and analysis of data, drafting and revising the manuscript for intellectual content. Heidi B. Schwarz: design of the study, coding, codebook development, validating coding and analysis of data, drafting and revising the manuscript for intellectual content. Thomas R. Vidic: design of the study, coding, codebook development, validating coding and analysis of data, drafting and revising the manuscript for intellectual content. Tait D. Shanafelt: conceptualization of the study, commenting on manuscript for intellectual content. Terrence L. Cascino: conceptualization of the study, commenting on manuscript for intellectual content. Christopher M. Keran: design of the study, coding, codebook development, drafting and revising the manuscript for intellectual content. Neil A. Busis: design of the study, coding, codebook development, validating analysis and interpretation of the data, drafting and revising the manuscript for intellectual content.

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DISCLOSURE

J. Miyasaki receives grants through PCORI, Parkinson Alberta, and Allergan; and is a member of the American Academy of Neurology Board of Directors. C. Rheume is an employee of the American Academy of Neurology. L. Gulya is an employee of the American Academy of Neurology. A. Ellenstein reports no disclosures relevant to the manuscript. H. Schwarz is a member of the American Academy of Neurology Board of Directors. T. Vidic is a member of the American Academy of Neurology Board of Directors. T. Shanafelt reports no disclosures relevant to the manuscript. T. Cascino serves as President of the American Academy of Neurology. C. Keran is an employee of the American Academy of Neurology. N. Busis receives honoraria for speaking at American Academy of Neurology courses and for serving as Alternate CPT Advisor for American Academy of Neurology, and is a member of the American Academy of Neurology Board of Directors. Go to Neurology.org for full disclosures.

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