



Review Article

Burnout and work-life balance in neurosurgery: Current state and opportunities

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ABSTRACT

Background: Burnout is a syndrome characterized by emotional exhaustion, depersonalization, and reduced sense of personal accomplishment. The syndrome has been recognized as a pandemic among physicians. The demanding nature of neurosurgery makes neurosurgeons, particularly prone to burnout. In recent years, pioneering work has shed light on burnout in the field of neurosurgery.

Methods: We have reviewed the literature in PUBMED on burnout in physicians, focusing on neurosurgical publications.

Results: In this manuscript, we explore the topic of burnout in neurosurgery by reviewing definitions, magnitude, etiologies, sequelae, and mitigation strategies.

Conclusion: Ongoing education, recognition, and targeted interventions for neurosurgeons at different career stages are needed to manage burnout proactively and ensure a resilient neurosurgical workforce.

Keywords: Burnout, Neurosurgery, Work-life balance

INTRODUCTION

Burnout, a syndrome which has been characterized by “exhaustion, cynicism, and reduced effectiveness,”^[43] is a pandemic in the medical community. Physicians are more likely to report burnout than the general population.^[28] In fact, national burnout rates among physicians have been reported to be >50%.^[40,46] Neurosurgeons are not immune to burnout, as reported rates in the specialty have ranged from 27% to 57%.^[24,29] Several facets of the job such as the acuity of neurosurgical patients, possibility of devastating neurological complications, and medicolegal concerns make neurosurgeons particularly prone to burnout.

Despite increased awareness of the topic in the past decade, burnout rates among neurosurgeons remain problematic, and opportunities for improvement remain. In this manuscript, we explore the topic of burnout in neurosurgery by reviewing definitions, magnitude, etiologies, sequelae, proposed solutions, and additional opportunities for improvement.

WORK-LIFE BALANCE AND BURNOUT

To understand well-being for a neurosurgeon, several inter-related concepts must be defined. Work-work balance for a neurosurgeon refers to balancing clinical and nonclinical duties such

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as teaching, research, administrative work, and leadership roles. Once work-related responsibilities are balanced, work must then be carefully integrated with other aspects of life to achieve work-life balance.

Work-life balance is challenging to define. Life involves everything outside of work such as family, friends, religion, sleep, exercise, hobbies, and other leisure activities. What is needed for work-life balance is not only unique for each neurosurgeon but it also changes during different stages of his/her life and career.^[10,37]

The concept of “burnout” emerged in the social psychology literature in the 1960s and 1970s. Early descriptions of burnout focused on groups such as lawyers serving vulnerable populations, volunteers working in urban clinics with drug addicts, and probation officers. Around 2000, dialog and investigation expanded to include broader populations such as health care workers.^[40]

Burnout is a psychological syndrome characterized by emotional exhaustion (EE), depersonalization (DP) of others, and decreased feelings of personal accomplishment.^[46] Specific to health care, Balch and Shanafelt have identified two common burnout symptoms: “treating patients and colleagues as objects rather than human beings, and feeling emotionally depleted.”^[5] Poor work-life balance and burnout are reciprocally related.^[10]

EXTENT OF BURNOUT

Within medicine, burnout is a pandemic that does not spare specific specialties or geographical areas. Burnout has been reported in medical specialties including anesthesia, cardiology, internal medicine, neurology, oncology, and radiology.^[6,25,26,35,46] Among surgical specialties, burnout has been reported in general surgery, gynecology surgery, neurosurgery, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, and urology.^[2,3,9,24,39,40,46,48]

In a landmark, cross-sectional study of the American College of Surgeons, which included almost 8000 respondents, Shanafelt *et al.* reported 40% rate of burnout, defined as a high score for EE or DP.^[42] In specific specialties, dissatisfaction with work-life balance may exceed 80%,^[48] and burnout rates may exceed 70%.^[40,46] Furthermore, burnout has not only been reported in the American health-care system but also in health-care systems in Canada, Europe, and the Middle East.^[1,2,6,9,49]

In addition to attending physicians, burnout affects medical students and resident trainees as well.^[1,3,39,40,46] In a 2019 meta-analysis study involving 47 studies on burnout among medical and surgical residents, the aggregate burnout rate was 51% overall.^[46] Burnout also leads to specialty choice regret.^[46] One survey of Canadian general surgery residents found that over 25% of respondents were considering leaving

their specialty.^[1] An American survey of surgical interns found that 1 in 7 of the trainees considered quitting their surgical career at least on a weekly basis.^[3]

Specifically within neurosurgery, survey results have demonstrated burnout rates ranging from 27% to 57% among attending neurosurgeons.^[24,29] In a recent national survey of members of the American Association of Neurological Surgeons, 30% of neurosurgeons indicated that they would not choose neurosurgery as a specialty again. About 52% of respondents believed their professional lives would worsen in the future. Poor work-life balance was identified as an independent factor associated with burnout and career dissatisfaction.^[29] In another survey of American neurosurgeons, Klimo *et al.* found that only 55% of neurosurgeons would recommend the job to a child.^[24]

FACTORS ASSOCIATED WITH BURNOUT

Many factors have been associated with burnout among physicians including administrative workload, alignment of values between administrators and physicians, a sense of control over the workplace, excessive number of call days, high patient quotas, inattention to personal wellness, long work hours, mistakes, poor cohesiveness among coworkers, poor patient outcomes, and technology allowing “constant access” to work.^[2,8,15,16,27,28,30,40]

At different career stages, different factors have been associated with burnout. Among residents, reported factors include sleep deprivation, working more than 80 h/week, and verbal abuse from faculty.^[39,46] In a specific survey querying neurosurgery residents, notable factors associated with burnout included inadequate operating room exposure, social stressors outside of work, and hostile faculty.^[4]

Researchers have also studied reasons why surgical residents leave their specialties. Poor work-life balance and “uncontrollable lifestyle” are commonly cited as the most important factors for quitting a residency.^[18,19,23] Other cited reasons include concerns about future employment and future quality of life.^[18]

It is also notable that specific subpopulations, such as female physicians, face unique challenges relating to burnout.^[14] Studies have shown that female residents are more likely to face burnout and leave surgical residencies compared to their male counterparts.^[23,28] Female physicians are more likely to experience sexual discrimination and bias compared to male physicians.^[9,17] Compared to male physicians, female physicians spend more time on childcare, caring for aging parents or other loved ones, and other household affairs.^[7,47] Unfortunately, the increased demands faced by female physicians often come at the “expense of personal physical and mental health.”^[36] The unique circumstances of female physicians and other physician subgroups must

be considered when designing focused strategies to mitigate burnout.

Among board-certified neurosurgeons, a 2013 survey identified low income, low collections, and concerns about future income and health-care reform as stressful factors contributing to burnout.^[24] A survey of neurosurgeons during the COVID pandemic found that >80% of respondents had uncertainty about future earnings and health-care reform.^[22]

SEQUELAE OF BURNOUT

The sequelae of burnout are significant and broad. Burnout affects physician health, family and social harmony, professional satisfaction, quality of medical care, and health-care costs.

Physicians with burnout are more likely to have systemic illness and psychiatric comorbidities such as depression.^[20,28,39] Numerous studies have reported increased rates of suicidal ideation among physicians compared to the general public.^[20,25,28,34,42,46] One survey found a suicidal ideation rate of 6.4% for surgeons.^[12]

Burnout has also been associated with tumultuous family and social lives. Studies have found increased rates of divorce, failed relationships, and work-home conflicts due to burnout.^[20,40] Surveys among surgeons found increased rates of self-isolation and lashing out at family and friends due to burnout.^[40]

Work dissatisfaction and burnout lead to job changes, transition away from clinical practice, and early retirement.^[8,20,37] A University of Ottawa study found that 50% of physician respondents have thought about leaving academic medicine and 30% thought of leaving medicine altogether.^[37]

Quality of health care is also associated with burnout among physicians. Several studies have demonstrated an association between burnout and medical errors, malpractice suits, and poor patient satisfaction scores.^[20,28,40,46]

From a business perspective, burnout is expensive and multifaceted. There are increased costs associated with turnover, decreased productivity, reduced overall quality in an organization, and physician recruitment and training.^[37,41] The cost of hiring and training subspecialists such as neurosurgeons can be particularly expensive.^[37]

SOLUTIONS FOR BURNOUT

Burnout affects individuals and organizations. Addressing burnout ideally involves effort on both fronts.

Physicians with perceived positive work-life balance are less likely to suffer from burnout. Suggested strategies, within a neurosurgeon's control, to improve work-life balance include

defining personal and professional values, defining limits, budgeting time, pursuing wellness, maintaining strong relationships, and keeping a positive and grateful attitude.^[20,44] Wellness refers to not only physical health but also mental and spiritual needs. Aspects of wellness include sleep, nutrition, avoidance of excessive alcohol use, avoidance of substance abuse, physical activity, recreational activity, and religious practices.^[16,20,39] Another particularly useful aid to minimize burnout among neurosurgeons is relationship building with colleagues.^[10,31] Strong professional relationships can help reduce stress, provide guidance and support, and enhance happiness in the workplace.

Evidence has shown that interventions on an organizational level can help mitigate burnout.^[50] Wellness and resiliency programs targeting residents^[32,38] and attending physicians^[11,33] have successfully reduced stress and EE. A recent review and meta-analysis of organizational interventions aimed at reducing physician burnout found that nearly every publication found positive impact on burnout, in particular EE.^[50]

One organization that has emphasized the shared responsibility between individual physicians and the organization for tackling physician satisfaction and burnout is Mayo Clinic. In a recent article by Tait and Noseworthy,^[43] the authors highlight the value of an engaged and satisfied work force. Reduced burnout helps organizations reach institutional goals. In the article, the authors describe nine strategies, which have successfully been operationalized at Mayo Clinic, including acknowledgment of the problem, leadership focused on burnout, implementation of targeted work unit interventions, cultivation of community at work, use of rewards and incentives wisely, alignment of values and culture, promotion of flexibility and work-life integration, distribution of resources to promote self-care, and support for organizational science. Additional details on these interventions are available in the article.

Reducing resident burnout and improved wellness are priorities for the US Accreditation Council for Graduate Medical Education (ACGME). Education about burnout and implementation of programs to mitigate burnout are goals of the ACGME's Clinical Environment Review (CLER) Program.^[21,45] The CLER program involves site visits by ACGME personnel culminating in feedback in six areas: patient safety; health-care quality; care transitions; supervision; well-being; and professionalism. Well-being of residents is a recognized priority for the ACGME.

CLOSING REMARKS AND OPPORTUNITIES IN NEUROSURGERY

In the past, burnout has been a silent pandemic harming neurosurgeon. More recently, pioneering work has been done to understand the prevalence of burnout and to

increase awareness of the problem for neurosurgeons.^[29,51] However, improved awareness of burnout and its deleterious effects is still needed. A recent editorial on burnout in neurosurgeons compared the recognition of burnout to identifying “the edge of a cliff in the dark.”^[13] To date, we still have an incomplete understanding of the factors that cause burnout among neurosurgeons. More work using validated instruments needs to be done to understand neurosurgery-specific drivers of burnout. Many authors have pointed out the need for specialty-specific solutions for burnout.^[41] Factors influencing burnout should not only be investigated for practicing neurosurgeons but also for medical students and neurosurgical residents. Armed with this data, proactive, ongoing interventions to promote resilience for neurosurgeons and neurosurgical trainees at different career stages can be tailored. Ongoing efforts to raise awareness, increase education, detect burnout early, and emphasize self-care and wellness will be critical components of these interventions. Participation with organizational efforts to address burnout will also be important.

CONCLUSION

Ongoing education and targeted interventions for neurosurgeons at different career stages are needed to manage burnout proactively and ensure a resilient neurosurgery workforce.

Declaration of patient consent

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Conflicts of interest

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REFERENCES

- Adams S, Ginther DN, Neuls E, Hayes P. Attitudes and factors contributing to attrition in Canadian surgical specialty residency programs. *Can J Surg* 2017;60:247-52.
- Alotaibi AK, Alsalim A, Alruwaili F, Almubarak A, Alhamzah A, Albahlal A, *et al*. Burnout during ophthalmology residency training: A national survey in Saudi Arabia. *Saudi J Ophthalmol* 2019;33:130-4.
- Antiel RM, Reed DA, Van Arendonk KJ, Wightman SC, Hall DE, Porterfield JR, *et al*. Effects of duty hour restrictions on core competencies, education, quality of life, and burnout among general surgery interns. *JAMA Surg* 2013;148:448-55.
- Attenello FJ, Buchanan IA, Wen T, Donoho DA, McCartney S, Cen SY, *et al*. Factors associated with burnout among US neurosurgery residents: A nationwide survey. *J Neurosurg* 2018;129:1349-63.
- Balch CM, Shanafelt T. Combating stress and burnout in surgical practice: A review. *Adv Surg* 2010;44:29-47.
- Banerjee S, Califano R, Corral J, de Azambuja E, De Mattos-Arruda L, Guarneri V, *et al*. Professional burnout in European young oncologists: Results of the European society for medical oncology (ESMO) young oncologists committee burnout survey. *Ann Oncol* 2017;28:1590-6.
- Baptiste D, Fecher AM, Dolejs SC, Yoder J, Schmidt CM, Couch ME, *et al*. Gender differences in academic surgery, work-life balance, and satisfaction. *J Surg Res* 2017;218:99-107.
- Campbell DA Jr., Sonnad SS, Eckhauser FE, Campbell KK, Greenfield LJ. Burnout among American surgeons. *Surgery* 2001;130:696-702.
- Cathelain A, Merlier M, Estrade JP, Duhamel A, Phalippou J, Kerbage Y, *et al*. Assessment of the quality of life of gynecologic surgeons: A national survey in France. *J Gynecol Obstet Hum Reprod* 2020;49:101791.
- Cheesborough JE, Gray SS, Bajaj AK. Striking a better integration of work and life: Challenges and solutions. *Plast Reconstr Surg* 2017;139:495-500.
- Dunn PM, Arnetz BB, Christensen JF, Homer L. Meeting the imperative to improve physician well-being: Assessment of an innovative program. *J Gen Intern Med* 2007;22:1544-52.
- Dyrbye LN, West CP, Sinsky CA, Goeders LE, Satele DV, Shanafelt TD. Medical licensure questions and physician reluctance to seek care for mental health conditions. *Mayo Clin Proc* 2017;92:1486-93.
- Eddleman CS, Aoun SG, Batjer HH. How to identify the edge of a cliff in the dark: Burnout and neurosurgery. *World Neurosurg* 2013;80:e111-3.
- Edmunds LD, Ovseiko PV, Shepperd S, Greenhalgh T, Frith P, Roberts NW, *et al*. Why do women choose or reject careers in academic medicine? A narrative review of empirical evidence. *Lancet* 2016;388:2948-58.
- Forsythe RO, Suttie SA. Enhancing junior doctors' working lives. *Surgery (Oxf)* 2020;38:607-11.
- Fournier I, Fakhry N, Kennel T, Tessier N, Bahgat A, Lechien JR, *et al*. Challenges faced by young otolaryngologists-head neck surgeons around the world. *Eur Ann Otorhinolaryngol Head Neck Dis* 2018;135:S67-73.
- Furnas HJ, Garza RM, Li AY, Johnson DJ, Bajaj AK, Kallianen LK, *et al*. Gender differences in the professional and personal lives of plastic surgeons. *Plast Reconstr Surg* 2018;142:252-64.
- Ginther DN, Dattani S, Miller S, Hayes P. Thoughts of quitting general surgery residency: Factors in Canada. *J Surg Educ* 2016;73:513-7.
- Herbert C, Kent S, Magennis P, Cleland J. What causes trainees to leave oral and maxillofacial surgery? A questionnaire survey. *Br J Oral Maxillofac Surg* 2017;55:37-40.
- Huber TS. Professionalism and the work-life balance. *J Vasc Surg* 2014;60:1072-82.
- Jennings ML, Slavin SJ. Resident wellness matters: Optimizing resident education and wellness through the learning environment. *Acad Med* 2015;90:1246-50.

22. Khalafallah AM, Lam S, Gami A, Dornbos DL 3rd, Sivakumar W, Johnson JN, *et al.* Burnout and career satisfaction among attending neurosurgeons during the COVID-19 pandemic. *Clin Neurol Neurosurg* 2020;198:106193.
23. Khoushhal Z, Hussain MA, Greco E, Mamdani M, Verma S, Rotstein O, *et al.* Prevalence and causes of attrition among surgical residents: A systematic review and meta-analysis. *JAMA Surg* 2017;152:265-72.
24. Klimo P Jr., DeCuypere M, Ragel BT, McCartney S, Couldwell WT, Boop FA. Career satisfaction and burnout among U.S. Neurosurgeons: A feasibility and pilot study. *World Neurosurg* 2013;80:e59-68.
25. Kuhn CM, Flanagan EM. Self-care as a professional imperative: Physician burnout, depression, and suicide. *Can J Anaesth* 2017;64:158-68.
26. Le Floch B, Bastiaens H, Le Reste JY, Lingner H, Hoffman RD, Czachowski S, *et al.* Which positive factors determine the GP satisfaction in clinical practice? A systematic literature review. *BMC Fam Pract* 2016;17:133.
27. Linzer M, Konrad TR, Douglas J, McMurray JE, Pathman DE, Williams ES, *et al.* Managed care, time pressure, and physician job satisfaction: Results from the physician worklife study. *J Gen Intern Med* 2000;15:441-50.
28. Marek AP, Nygaard RM, Liang ET, Roetker NS, DeLaquil M, Gregorich S, *et al.* The association between objectively-measured activity, sleep, call responsibilities, and burnout in a resident cohort. *BMC Med Educ* 2019;19:158.
29. McAbee JH, Ragel BT, McCartney S, Jones GM, Michael LM 2nd, DeCuypere M, *et al.* Factors associated with career satisfaction and burnout among US neurosurgeons: Results of a nationwide survey. *J Neurosurg* 2015;123:161-73.
30. McCain RS, McKinley N, Dempster M, Campbell WJ, Kirk SJ. A study of the relationship between resilience, burnout and coping strategies in doctors. *Postgrad Med J* 2017;94:43-7.
31. McKenna KM, Hashimoto DA, Maguire MS, Bynum WE 4th. The missing link: Connection is the key to resilience in medical education. *Acad Med* 2016;91:1197-9.
32. Mueller CM, Buckle M, Post L. A facilitated-group approach to wellness in surgical residency. *JAMA Surg* 2018;153:1043-4.
33. Olson K, Marchalik D, Farley H, Dean SM, Lawrence EC, Hamidi MS, *et al.* Organizational strategies to reduce physician burnout and improve professional fulfillment. *Curr Probl Pediatr Adolesc Health Care* 2019;49:100664.
34. Oskrochi Y, Maruthappu M, Henriksson M, Davies AH, Shalhoub J. Beyond the body: A systematic review of the nonphysical effects of a surgical career. *Surgery* 2016;159:650-64.
35. Panagioti M, Geraghty K, Johnson J. How to prevent burnout in cardiologists? A review of the current evidence, gaps, and future directions. *Trends Cardiovasc Med* 2018;28:1-7.
36. Raffi J, Trivedi MK, White L, Murase JE. Work-life balance among female dermatologists. *Int J Womens Dermatol* 2020;6:13-9.
37. Raja S, Stein SL. Work-life balance: History, costs, and budgeting for balance. *Clin Colon Rectal Surg* 2014;27:71-4.
38. Riall TS, Teiman J, Chang M, Cole D, Leighn T, McClafferty H, *et al.* Maintaining the fire but avoiding burnout: Implementation and evaluation of a resident well-being program. *J Am Coll Surg* 2018;226:369-79.
39. Sargent MC, Sotile W, Sotile MO, Rubash H, Barrack RL. Quality of life during orthopaedic training and academic practice. Part 1: Orthopaedic surgery residents and faculty. *J Bone Joint Surg Am* 2009;91:2395-405.
40. Senturk JC, Melnitchouk N. Surgeon burnout: Defining, identifying, and addressing the new reality. *Clin Colon Rectal Surg* 2019;32:407-14.
41. Shanafelt T, Goh J, Sinsky C. The business case for investing in physician well-being. *JAMA Intern Med* 2017;177:1826-32.
42. Shanafelt TD, Balch CM, Bechamps GJ, Russell T, Dyrbye L, Satele D, *et al.* Burnout and career satisfaction among American surgeons. *Ann Surg* 2009;250:463-71.
43. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: Nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc* 2017;92:129-46.
44. Shanafelt TD, Oreskovich MR, Dyrbye LN, Satele DV, Hanks JB, Sloan JA, *et al.* Avoiding burnout: The personal health habits and wellness practices of US surgeons. *Ann Surg* 2012;255:625-33.
45. Smith KA, Glusman MB. Career satisfaction and burnout among neurosurgeons. *J Neurosurg* 2016;124:883-4.
46. Somerson JS, Patton A, Ahmed AA, Ramey S, Holliday EB. Burnout among United States orthopaedic surgery residents. *J Surg Educ* 2020;77:961-8.
47. St John M, Bradford CR. Work-life balance among head and neck surgeons-seeking visionary leadership from everywhere. *JAMA Otolaryngol Head Neck Surg* 2019;145:458-9.
48. Szender JB, Grzankowski KS, Eng KH, Lele SB, Odunsi K, Frederick PJ. Satisfaction with work-life balance among U.S. Gynecologic oncologists, a cross-sectional study. *Am J Clin Exp Obstet Gynecol* 2015;2:166-75.
49. van Vendeloo SN, Brand PL, Verheyen CC. Burnout and quality of life among orthopaedic trainees in a modern educational programme: Importance of the learning climate. *Bone Joint J* 2014;96:1133-8.
50. West CP, Dyrbye LN, Erwin PJ, Shanafelt TD. Interventions to prevent and reduce physician burnout: A systematic review and meta-analysis. *Lancet* 2016;388:2272-81.
51. Zaed I, Jaaidane Y, Chibbaro S, Tinterri B. Burnout among neurosurgeons and residents in neurosurgery: A systematic review and meta-analysis of the literature. *World Neurosurg* 2020;143:e529-34.

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