



Stress, burnout, and maladaptive coping: Strategies for surgeon well-being

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Burnout is a clinical syndrome characterized by emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment. Symptoms of burnout include physical exhaustion, poor judgment, cynicism, guilt, feelings of ineffectiveness, and a sense of disconnection with co-workers or patients. Burnout is measured using the Maslach Burnout Inventory, a high reliability tool that is generally considered to be the best-validated metric of this condition. Studies mentioned in this article employ this instrument to detect burnout among participants.

Research suggests that approximately half of practicing physicians claim medical practice is very or extremely stressful, and cite personal distress (burnout) as a significant problem.^{1,2} Similarly, up to 40 percent of practicing surgeons experience considerable stress and subsequent burnout during their career.^{3,4} However, burnout is not limited to practicing physicians and surgeons. Other vulnerable groups include residents and medical students. Approximately 50 percent of medical students in the U.S. suffer from burnout while in medical school, according to longitudinal, multi-institutional studies.⁵⁻⁷ Medical students may be challenged by professional and personal issues that can result in dropping out of medical school, experiencing depression, and even suicidal ideation. Increasingly, the literature describes inherent and modifiable risk factors for medical student burnout, and offers general strategies to address these factors. While these efforts are laudable, few studies investigate the professional and personal challenges faced by surgical trainees and young surgeons. In an

effort to care for the caregiver, specifically surgical residents, the following article briefly summarizes the impact of stress, burnout, and maladaptive coping mechanisms on practicing physicians and surgeons, medical and surgical residents, and medical students. The article also suggests several adaptive coping strategies for improving practitioner well-being.

Practicing physicians and surgeons

The arduous and lengthy training period, high-stakes decision making, and litigious practice environment are just a few of the numerous factors that contribute to surgeon stress and burnout. Moreover, surgeons are challenged by a considerable overall workload, long hours, frequent night and weekend call, and family responsibilities. These and other stressors can have serious manifestations that may impact personal well-being, work performance, and ultimately patient safety. Surgeons—in part, because of their personality traits and work environment—are at risk for anxiety, depression, stressed or broken relationships, substance dependence, and possibly suicide as a result of these stressors.⁸ Yet, the clandestine culture of surgery is one of tireless self-sacrifice, self-reliance, singularity of focus, emotional permanence, and silent suffering, all of which may contribute to work-life imbalance and mask potentially onerous mental health and substance abuse problems.

In 2007, Wallace and Lemaire identified positive and negative factors associated with physician well-being through in-depth interviews with 48 faculty and six resident physicians at a single university department of medicine in a large, metropolitan area of

Canada.⁹ Regression analysis of survey responses of 183 physicians and residents in the same department revealed that work overload, negative patient interactions, and emotional demands were negatively related to physician well-being, with the emotional demands of work generating the most negative association. However, work hours and work-to-family conflict were not negatively related to physician well-being. In fact, regardless of the amount of work resources, physician work hours were unrelated to well-being. Co-worker and spouse support, as well as positive patient interactions, buffered work overload and emotional demands, thereby positively influencing physician well-being. To potentially alleviate unnecessary stress and strengthen support mechanisms for physicians, the authors proposed a strategy to reduce stress. They recommended the establishment of a multidisciplinary, team-based approach to patient care in a more open and supportive work environment to enhance social support and communication.⁹ The authors recommended that groups solidify functional teams by organizing team-building and social events, facilitating feedback, and working toward common goals.¹⁰

Improving physician well-being is important to prevent the negative consequences associated with stress and burnout, which affect an estimated 25 percent to 75 percent of physicians.¹¹ Shanafelt and colleagues queried 465 faculty physicians about burnout, professional activities, and effort dedicated to each activity.¹² Thirty-four percent of respondents met the criteria for burnout, and most (68 percent) claimed that patient care was the most meaningful aspect of their work. Faculty physicians who spent more time on the activity that is most meaningful to them had significantly lower rates of burnout. The authors suggested optimizing career fit to promote physician satisfaction, help reduce attrition from burnout, and lessen the cost of replacing a faculty physician, which is estimated to cost \$150,000 to \$300,000.^{12,13}

Stress and burnout among practicing surgeons can have significant repercussions as well. A recent review by Balch and colleagues culled the evidence related to personal and professional consequences of stress and burnout across various surgical specialties, including general surgery, surgical oncology, transplant surgery, and otolaryngology-head and neck surgery.⁸ The authors relayed worrisome data

suggesting that when surgeons fail to recognize the symptoms of burnout, serious physical, mental, and social well-being ramifications may result. If burnout is dealt with inappropriately or inadequately, surgeons risk sleep disturbances, hypertension, anxiety, alcohol-dependence, and myocardial infarction. The authors also acknowledged a higher risk of depression and suicide, particularly among younger and female practicing surgeons, respectively. Personal relationships may also suffer—the cumulative incidence of divorce after 30 years of marriage is highest among surgeons, regardless of the amount of work resources or hours worked.⁸ Furthermore, burnout and depression among practicing surgeons are independent predictors of reporting perceived medical errors, which suggests that surgeon distress may contribute to medical errors.¹⁴ Surgeons—with their idealistic and perfectionist nature—readily devote themselves wholly to their work. While admirable, doing so seems to increase their burnout risk.

With increasing success, researchers are defining psychosocial stressors that contribute to burnout and risk stratifying practitioners by demographics, medical specialty, and practice environment. However, an oft-overlooked obstacle to a surgeon's well-being is occupational injury from physical stress, especially among surgeons who perform a high volume of laparoscopic procedures.¹⁵⁻¹⁶ Recently, Park and colleagues surveyed 317 surgeons who performed, on average, 212 laparoscopic operations annually.¹⁶ The authors found that 86.9 percent of respondents reported physical discomfort or symptoms attributable to performing laparoscopy. Not surprisingly, surgeon age and laparoscopic case volume positively correlated with physical symptoms. Confounding the issue is the fact that only 58.7 percent of participating surgeons reported sufficient awareness of available surgical ergonomics recommendations. Only a small majority (60 percent) of surgeons who expressed awareness of such recommendations actually applied them to their practice. The authors called for improved working conditions in the operating room, particularly for the high-volume, minimally invasive surgeon, and wider dissemination and implementation of data-driven surgical ergonomics recommendations. Moreover, the authors warned that surgical careers shortened by occupational injury from physical stress could further exacerbate the surgeon shortage in the U.S.¹⁶ Ultimately, stakeholders—providers, administrators,

surgical organizations, social scientists, government, and the public at large—should continue to identify the various psychosocial and physical stressors that contribute to burnout, and ought to strongly encourage the adoption of healthy coping strategies aimed at surgeon well-being.

Residents and medical students

While it is important to recognize and address burnout among attending physicians, the problem may begin much earlier. Burnout affects medical students as well as medical and surgical residents across various disciplines. A cross-sectional study conducted by Dyrbye and colleagues surveyed 2,682 medical students from seven medical schools in the U.S.¹⁷ Among respondents, burnout was prevalent (52.8 percent) and independently associated with reporting one or more unprofessional behaviors or holding a less altruistic view of physicians' responsibility to society.¹⁷ Additionally, burnout among medical students may be associated with less empathy, as well as an increased risk of serious thoughts of dropping out of medical school.^{6,18} In general, a variety of personal and professional factors influence medical student well-being, but satisfaction with certain attributes of the learning environment may be critical.¹⁹

At present, a considerable number of publications confirm highly variable but concerning rates of burnout and depression in medical residents (17 percent to 76 percent and 20 percent to 37 percent) and obstetrics and gynecology residents (15 percent to 90 percent and 34 percent).²⁰⁻²² According to the latest studies, medical residents suffering burnout are significantly more likely to self-report one or more suboptimal patient care practices monthly.²⁰ Another study showed that recent internal medicine residency graduates are twice as likely to experience burnout compared with faculty physicians, with 22 percent of graduates claiming they would not pursue medicine again if given the opportunity.²¹

Burnout among residents can distort career decisions, impact well-being, and negatively affect patient care, but not all the news is bad. In a longitudinal, cross-sectional survey study of 134 internal medical residents from a single institution in the U.S., West and colleagues demonstrated a lack of association between resident well-being and competence in medical knowledge, as determined by standardized test scores.²³ The authors surmised that the known

effects of resident burnout on patient care are unlikely to be mediated by a lack of medical knowledge.²³ Survey research conducted using a similar population revealed that medical residents' assessment of faculty performance is not influenced by resident quality of life, burnout, or depression.²⁴ So, medical residents suffering burnout do not perform worse on standardized tests or submit unwarranted negative evaluations.

Like medical residents, surgical residents are not immune to stress. However, fewer publications report rates of burnout among residents in general surgery (11.8 percent), otolaryngology-head and neck surgery (75 percent), and orthopaedic surgery (56 percent).²⁵⁻²⁷ Interestingly, surgical residents may suffer burnout less often than their medical colleagues, as described by a study conducted in the Netherlands. Prins and colleagues surveyed 2,115 medical and surgical residents (170 in general surgery, 270 in surgical specialties) and found that 21 percent of respondents met criteria for burnout and only 27 percent were highly engaged with their work.²⁵ Subgroup analysis revealed a lower rate of burnout among residents in general surgery (11.8 percent) compared with surgical specialties (24.3 percent). Interestingly, general surgery residents represented the discipline with the lowest number of individuals suffering burnout and the highest degree of engagement, vigor, dedication, and absorption compared with other disciplines.²⁵ Due to differences in practice environments and duty-hour restrictions between the Netherlands and the U.S., these results should be extrapolated cautiously. Regardless, the problem is all too common. As such, adaptive coping strategies are necessary to prevent untoward consequences.

Coping strategies

Unfortunately, coping strategies employed by surgeons are often not the most beneficial for dealing with stress and maintaining a sound work-life balance. Social scientists have suggested several theories as to why physicians demonstrate difficulty in dealing with these stressors in a healthy manner. Research demonstrates that physicians are reluctant to seek help from others, employ denial and avoidance as coping strategies, and disregard signs and symptoms of burnout. Physicians frequently ignore their own health, delay their own medical treatment, and avoid problems that may negatively impact their ability to care for patients.²⁸ Instead, physicians often adhere to the

unspoken values and norms of their specialty culture, thereby consciously or subconsciously accepting the perceived stigma they associate with seeking help.²⁹

The most frequent coping strategies are active coping, planning, restraint, and acceptance. The least frequently employed strategies include religion, denial, substance abuse, and humor.²⁹ Until recently, little research addressed exactly which coping strategies might help prevent surgeon burnout and improve well-being. A study by Lemaire and Wallace explored the prevalence and consequences of burnout among 1,178 physicians and surgeons within a large health region in western Canada.²⁹ For surgeons in the group, the three most commonly employed coping strategies to combat workplace stress—keeping stress to oneself, concentrating on what to do next, and going on as if nothing happened—positively correlated

with feeling emotionally exhausted. These strategies reflect maladaptive denial responses to stress. Fewer participants used adaptive coping strategies—taking a time out, using humor, talking with colleagues—to alleviate stress at work. According to study results, physicians and surgeons adopted beneficial strategies to cope with stress after leaving work by setting aside quiet time, exercising, and spending time with family. These coping strategies to contest workplace stress negatively correlated with feeling emotionally exhausted.²⁹

A general strategy to contest workplace stress and promote personal well-being appears in Table 1 on this page.³⁰ For surgical residents and health care providers, the opportunities to achieve personal and professional well-being are many, but so are the significant risks of unmanaged stress and burnout,

Table 1.
Strategies for surgeon well-being³⁰

- Identify personal and professional values and priorities
- Reflect on personal values and priorities
- Strive to achieve work-life balance
- Rank personal and professional values and priorities in order of importance
- Identify areas where personal and professional goals may be incompatible
- Determine how personal and professional conflicts should be managed
- Enhance areas of work that are personally meaningful
- Reflect on areas of work that are most meaningful (PEAR)
 - Patient care
 - Education
 - Administration
 - Research
- Reshape practice to increase focus in areas of personal meaning
- Decide on the value of further training for stress reduction
- Reflect with colleagues about stressful and rewarding aspects of practice
- Reassess areas of work that are personally meaningful

Table 2.
Individual strategies for adaptive coping

- Recognize stress and emotional burnout and adopt adaptive coping strategies
- Cultivate and maintain healthy personal relationships and spiritual practices
- Seek medical and/or mental health care when needed or directed
- Maintain appropriate nutrition and physical fitness
- Strive to establish and sustain work-life balance

Organizational strategies for adaptive coping

- Enhance the management style of organizational leadership to recognize surgical residents at risk
- Create a safe learning environment
- Provide and mandate stress management training
- Raise awareness of confidential counseling services
- Create relationship-building opportunities for residents, spouses, and families
- Address the critical contributors to burnout among female residents and dual-physician relationships (through improved flexibility of child care in the workplace and adjusted timelines for promotion)^{31,33}
- Support resident research and continuing education activities
- Establish mutually beneficial mentorships between residents and faculty
- Optimize residents' perceived value to the organization

which impact females and males differently.³¹ Based on current research, the coping strategies that appear in Table 2, on page 20, if used by individuals and organizations and encouraged or included as components of surgical residency training, can help identify and manage surgeon stress and burnout.^{32,33}

Summary

Practicing physicians and surgeons, medical and surgical residents, and medical students dedicate their lives to providing optimum patient care, but doing so places them at significant risk for personal and professional stress and, ultimately, burnout. Of great concern is the fact that unrecognized stress and unmanaged burnout are more prevalent among residents than previously believed. Research shows that stress without conflict resolution may lead to burnout, which can contribute to impaired technical performance, medical errors, physical and mental health problems, and even increase the risk of suicide. Therefore, it is crucial that surgeons, and the organizations that train and employ them, recognize the early signs of stress and burnout, adopt adaptive coping strategies, and maintain a culture wherein work-life balance and surgeon well-being are shared goals. 

References

- Henry J. OMA membership survey results confirm overwhelming level of frustration among Ontario physicians. *Ontario Med Rev.* 2004;71:1-6.
- Shanafelt TD, Sloan JA, Habermann TM. The well-being of physicians. *Am J Med.* 2003;114(6):513-519.
- Campbell DA Jr, Sonnad SS, Eckhauser FE, Campbell KK, Greenfield LJ. Burnout among American surgeons. *Surgery.* 2001;130(4):695-705.
- Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, Collicott P, Novotny PJ, Sloan J, Freischlag JA. Burnout and career satisfaction among American surgeons. *Ann Surg.* 2009;250(3):463-471.
- Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, Durning S, Moutier C, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. Burnout and suicidal ideation among U.S. medical students. *Ann Int Med.* 2008;149(5):334-341.
- Dyrbye LN, Thomas MR, Power DV, Durning S, Moutier C, Massie FS Jr, Harper W, Eacker A, Szydlo DW, Sloan JA, Shanafelt TD. Burnout and serious thoughts of dropping out of medical school: A multi-institutional study. *Acad Med.* 2010;85(1):94-102.
- Dyrbye LN, Power DV, Massie FS, Eacker A, Harper W, Thomas MR, Szydlo DW, Sloan JA, Shanafelt TD. Factors associated with resilience to and recovery from burnout: A prospective, multi-institutional study of U.S. medical students. *Med Educ.* 2010;44(10):1016-1026.
- Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: Understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg.* 2009;144(4):371-376.
- Wallace, JE, Lemaire J. On physician well being—you'll get by with a little help from your friends. *Soc Sci Med.* 2007;64(12):2565-2577.
- Arnetz BB. Staff perception of the impact of health care transformation on quality of care. *Int J Qual Health Care.* 1999;11(4):345-351.
- Wallace JE, Lemaire JB, Ghali WA. Physician wellness: A missing quality indicator. *Lancet.* 2009;374(9702):1714-1721.
- Shanafelt TD, West CP, Sloan JA, Novotny PJ, Poland GA, Menaker R, Rummans TA, Dyrbye LN. Career fit and burnout among academic faculty. *Arch Int Med.* 2009;169(10):990-995.
- Linzer M, Visser MR, Oort FJ, Smets EM, McMurray JE, de Haes HC; Society of General Internal Medicine (SGIM) Career Satisfaction Study Group (CSSG). Predicting and preventing physician burnout: Results from the United States and Netherlands. *Am J Med.* 2001;111(2):170-175.
- Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye

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- L, Satele D, Collicott P, Novotny PJ, Sloan J, Freischlag J. Burnout and medical errors among American surgeons. *Ann Surg.* 2010;251(6):995-1000.
15. Szeto GP, Ho P, Ting AC, Poon JT, Cheng SW, Tsang RC. Work-related musculoskeletal symptoms in surgeons. *J Occup Rehab.* 2009;19(2):175-184.
 16. Park A, Lee G, Seagull FJ, Meenaghan N, Dexter D. Patients benefit while surgeons suffer: An impending epidemic. *J Am Coll Surg.* 2010;210(3):306-313.
 17. Dyrbye LN, Massie FS Jr, Eacker A, Harper W, Power D, Durning SJ, Thomas MR, Moutier C, Satele D, Sloan J, Shanafelt TD. Relationships between burnout and professional conduct and attitudes among U.S. medical students. *JAMA.* 2010;304(11):1173-1180.
 18. Brazeau CM, Schroeder R, Rovi S, Boyd L. Relationships between medical student burnout, empathy, and professionalism climate. *Acad Med.* 2010;85(10 Suppl):S33-S36.
 19. Dyrbye LN, Thomas MR, Harper W, Massie FS Jr, Power DV, Eacker A, Szydlo DW, Novotny PJ, Sloan JA, Shanafelt TD. The learning environment and medical student burnout: A multicentre study. *Med Educ.* 2009;43(3):274-282.
 20. Shanafelt TD, Bradley KA, Wipf JW, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Int Med.* 2002;136(5):358-367.
 21. Cohen JS, Patten S. Well being in residency training: A survey examining resident physician satisfaction both within and outside of residency training and mental health in Alberta. *BMC Med Educ.* 2005;5:21.
 22. Becker JL, Milad MP, Klock SC. Burnout, depression, and career satisfaction: Cross-sectional study of obstetrics and gynecology residents. *Am J Obstet Gynecol.* 2006;195(5):1444-1449.
 23. West CP, Shanafelt TD, Cook DA. Lack of association between resident doctors' well-being and medical knowledge. *Med Educ.* 2010;44(12):1224-1231.
 24. Beckman TJ, Reed DA, Shanafelt TD, West CP. Impact of resident well-being and empathy on assessments of faculty physicians. *J Gen Int Med.* 2009;25(1):52-56.
 25. Prins JT, Hoekstra-Weebers JE, Gazendam-Donofrio SM, Dillingh GS, Bakker AB, Huisman M, Jacobs B, van der Heijden FM. Burnout and engagement among resident doctors in The Netherlands: A national study. *Med Educ.* 2010;44(3):236-247.
 26. Golub JS, Weiss PS, Ramesh AK, Ossoff RH, Johns MM III. Burnout in residents of otolaryngology-head and neck surgery: A national inquiry into the health of residency training. *Acad Med.* 2007;82(6):596-601.
 27. 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(10):2395-2405.
 28. King MB, Cockcroft A, Gooch C. Emotional distress in doctors: Sources, effects and help sought. *J R Soc Med.* 1992;85(10):605-608.
 29. Lemaire JB, Wallace JE. Not all coping strategies are created equal: A mixed methods study exploring physicians' self reported coping strategies. *BMC Health Services Res.* 2010;10:208-218.
 30. Balch CM, Copeland E. Stress and burnout among surgical oncologists: A call for personal wellness and a supportive workplace environment. *Ann Surg Oncol.* 2007;14(11):3029-3032.
 31. Dyrbye LN, Shanafelt TD, Balch CM, Satele D, Sloan J, Freischlag J. Relationship between work-home conflicts and burnout among American surgeons. *Arch Surg.* 2011;146(2):211-217.
 32. Lemaire JB, Wallace JE, Dinsmore K, Lewin AM, Ghali WA, Roberts D. Physician nutrition and cognition during work hours: Effect of a nutrition based intervention. *BMC Health Serv Res.* 2010;10:241-249.
 33. Dyrbye LN, Shanafelt TD, Balch CM, Satele D, Freischlag J. Physicians married or partnered to physicians: A comparative study in the American College of Surgeons. *J Am Coll Surg.* 2010;211(5):663-671.

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