Training for and practicing surgery are stressful endeavors.1-4 Studies5-11 involving national samples of surgeons from surgical subspecialty societies and graduates of surgical training programs suggest that burnout rates among surgeons range from 30% to 38%. These statistics indicate that a substantial number of our colleagues are struggling with personal and professional distress at a level that should be of concern to all surgeons.

Surgeons work hard, work long hours, deal regularly with life-and-death situations with their patients, and make substantial personal sacrifices to practice in their field. These attributes of surgical practice, along with the rigors and length of training for this profession, attract individuals of a particular character and determination. These individuals share an unwritten but understood code of rules, norms, and expectations. This code includes coming in early and staying late, working nights and weekends, performing a high volume of procedures, meeting multiple simultaneous deadlines, never complaining, and keeping emotions or personal problems from interfering with work. These are hallmarks of dedicated professionals that should be celebrated and rewarded. However, there is a fine line separating dedication from overwork; if unchecked, overwork could lead to counterproductive, unhealthy, or even self-destructive behavior that may affect patient care. Studies5-11 show that a substantial proportion of surgeons experience distress or burnout, conditions that can have negative repercussions for themselves, their families, their colleagues, and their patients.

The goals of this review are to (1) increase awareness of the symptoms, causes, and consequences of surgeon distress and burnout, (2) encourage surgeons to be proactive in their personal health habits, (3) prompt leaders of surgery departments and training programs to incorporate a supportive workplace environment, and (4) stimulate research in these areas.

STRESS AMONG SURGEONS

Distress among surgeons can have serious manifestations, including anxiety, depression, divorce or broken relationships, alcoholism, substance abuse, and suicide. Unfortunately, many of these problems are more prevalent among surgeons and physicians compared with those who practice some other professions. Current estimates are that approximately 15% of all physicians will be impaired at some time in their careers and will be unable to meet professional responsibilities because of mental illness, alcoholism, or drug dependency.12 Although many surgeons may believe they are more resilient than their colleagues in other specialties, the traits that define the surgeon (eg, commitment, self-sacrifice, singularity of focus) and the surgical workplace environment may place surgeons at particular risk for overwork and for imbalance between personal and professional life.

DEPRESSION AND SUICIDE

In a prospective study of more than 1300 male physicians from The Johns Hopkins University, the lifetime prevalence of clinically significant depression was 12.8%.13 In a study of 4500 female physicians in the...
Women Physicians’ Health Study, the prevalence was 19.5%. In another study, 20% of nearly 2000 survey respondents who are full-time academic physicians and basic science faculty members had significant levels of depressive symptoms, with higher levels in younger faculty members. Although the lifetime rates of depression among physicians appear to be similar to those of the general population, suicide is a disproportionately high cause of mortality in physicians. Compared with other professionals, a male physician’s proportionate mortality ratio from suicide is nearly 1.5- to 3.8-fold higher (Figure). The discrepancy is even greater among female physicians, who have a 3.7- to 4.5-fold increased risk of death from suicide.

Unfortunately, the culture of medicine usually accords a low priority to physician mental health despite evidence of a high rate of untreated mood disorders and an increased burden of suicide. Too often, depression remains unrecognized or untreated until a physician’s personal distress compromises his or her capacity to care for patients. For physicians seeking help, there is often a punitive response, including discrimination in medical licensing, hospital privileges, and professional advancement. Thus, although physicians may have more ready access to medical care for treatment for depression, they face daunting regulatory and workplace barriers that may dissuade them from seeking help.

**ALCOHOL AND SUBSTANCE ABUSE**

Physician impairment by substance abuse represents a significant challenge with potential grave consequences for patients and society. Although data are sparse, the prevalence of alcohol and illicit drug abuse among physicians is probably similar to that of the general population. Problematic alcohol use (ie, symptoms of alcohol dependence or having had ≥6 drinks on 1 occasion in the last year) was reported by 6.8% of surgeons in a recent study of members of the Society of Surgical Oncology, with a similar frequency reported in a separate study of 110 surgical residency graduates from the University of Wisconsin–Madison. Most physicians who are treated for alcoholism or drug dependence appear to have favorable outcomes, although potential ramifications for licensing and hospital privileges may deter some physicians from seeking assistance.

**DIVORCE AMONG PHYSICIANS AND SURGEONS**

One large, prospective study of 1118 married physicians found that the cumulative incidence of divorce after 30 years of marriage was 29%. Specialty choice was independently associated with the risk of divorce, with the highest divorce rates among surgeons (33% after 30 years) and psychiatrists (50% after 30 years). Higher levels of anger and getting married before medical school graduation were also associated with higher divorce rates. Surgeons continued to have a higher divorce rate (relative risk of 1.7 compared with internal medicine physicians) on multivariate analysis controlling for other factors. Several studies of physicians and their spouses suggest that the ways in which couples treat each other, communication styles, differences in the need for intimacy, and the degree of work-related stress are more important factors for marital satisfaction than the number of hours worked by physicians.

**BURNOUT: WHAT IS IT?**

Although most surgeons are aware of major depression and anxiety disorders, they may be less familiar with the specific symptoms associated with burnout or the consequences of those symptoms. Burnout is a form of personal distress that appears in a markedly more common fashion among physicians compared with depression, substance abuse, and suicide. As a clinical syndrome, burnout is characterized by emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment. It is a syndrome that primarily affects individuals such as physicians, nurses, and social workers, whose work involves constant demands and intense interactions with people who have great physical and emotional needs.

Two common symptoms of burnout are treating patients and colleagues as objects rather than human beings and feeling emotionally depleted. Symptoms of burnout also include physical exhaustion, poor judgment, cynicism, guilt, feelings of ineffectiveness, and a sense of depersonalization in relationships with coworkers or patients.

**CONSEQUENCES OF SURGEON BURNOUT**

Burnout can affect physicians’ satisfaction with their work and the quality of medical care they provide (Table 1). Increasing evidence suggests that physician burnout can adversely affect patient safety and quality of patient care and contribute to medical errors. Studies suggest a dose-response relationship between the magnitude of burnout and measures of suboptimal patient care. In addition to its potential effect on patient safety, physician burnout should also be of concern to health care organizations because workers who are less satisfied tend to be less productive and eventually may decide to quit for a different practice opportunity or take early retirement. Medical errors and patient lack of satisfaction with medical care provided by burned-out
physicians also increase the threat of malpractice litigation; hence, physician burnout also poses substantial risk to the economic well-being of health care organizations.40-41 These findings underscore the importance of burnout to physicians and practice administrators who are responsible for the workplace environment. Work-related burnout can spill over into personal life and contribute to broken relationships, substance abuse, and other types of distress. Burnout has also been associated with poor health, including headaches, sleep disturbances, hypertension, anxiety, alcoholism, and myocardial infarction.32-35,42

INCIDENCE OF STRESS AND BURNOUT AMONG SURGICAL SPECIALTIES

General Surgeons

In a large study4 of 582 surgeons who trained at the University of Michigan–Ann Arbor, 32% showed high levels of emotional exhaustion, 13% showed high levels of depersonalization, and 4% showed evidence of a low sense of personal accomplishment. Notably, younger surgeons were more susceptible to burnout than their older colleagues (P < .01). Burnout was not found to be related to caseload, practice setting, or percentage of patients insured by a health maintenance organization. In contrast, etiologic factors associated with burnout were a sense that work was “overwhelming”; a perceived imbalance among career, family, and personal growth; perceptions that one’s career is unrewarding; and lack of autonomy. More important, burnout was strongly associated with a desire to pursue early retirement.3

These issues are not unique to US surgeons. An Australian study9 of 126 surgeons indicated that burnout levels were significantly higher for surgeons than for the normative population, with 47.6% of the sample reporting high burnout levels. Younger surgeons reported significantly higher burnout levels, regardless of career stage. Burnout correlated significantly with early retirement and/or intentions for retraining and was inversely related to overall emotional intelligence levels. Another study10 of 501 colorectal and vascular surgeons in the United Kingdom showed that 32% had high burnout on at least 1 subscale of the Maslach Burnout Inventory. Surgeons who planned to take early retirement or wished to retire as soon as they could afford to do so were more likely to have psychiatric morbidity and/or burnout.

Surgical Oncologists

In the recently published survey7 of 549 members of the Society of Surgical Oncology, 28% of respondents met the criteria for burnout. In addition, approximately 30% of study participants screened positive for depression. Given the sensitivity (96%) and specificity (57%) of the screening instrument used,31,41 this finding implies that approximately 10% of respondents would have met the criteria for major depressive disorder at the time of the survey if they had undergone a full psychiatric assessment. Burnout was more common among respondents 50 years or younger (31% vs 22%; P = .03) and women (37% vs 26%; P = .03).

Burnout was strongly associated with both potentially problematic alcohol use (12.4% burned out vs 4.6% not burned out, P = .001) and lower career satisfaction. No differences were found between private practice physicians and academic physicians in frequency of burnout, symptoms of depression, potentially problematic alcohol or other drug use, or mental or physical quality of life.7

Transplantation Surgeons

Bertges and colleagues8 conducted a survey of 209 actively practicing transplantation surgeons. Burnout was present in 38% of respondents. Several significant predictors of emotional exhaustion were identified and included questioning one’s career choice, giving up outside activities, and perceiving oneself as having limited control over the provision of medical services. In contrast, surgeons who reported greater professional growth opportunities, institutional support, and a sense of being appreciated by their patients experienced a high sense of personal accomplishment. Prioritizing goals to reflect both personal and professional values was associated with both lower emotional exhaustion and a higher sense of personal accomplishment.8

Head and Neck Surgeons

Johnson and colleagues11 conducted a survey of 395 members of the American Society of Head and Neck Surgery and the Society of Head and Neck Surgeons in 1993. A total of 34% who responded believed they were “burned out.” Most respondents replied that they enjoyed their work, but the stress of extended work hours, dealing with seriously ill patients, and the increased need to deal with governmental and economic issues were their sources of greatest concern.

WHAT ARE THE CAUSES OF BURNOUT?

One of the tragic paradoxes of burnout is that those most susceptible appear to be the most dedicated, conscientious, responsible, and motivated. Individuals with these

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<td><strong>Professional</strong></td>
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<td>Poor judgment in patient care decision making</td>
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<td>Medical errors</td>
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<td>Adverse patient events</td>
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<td>Diminished commitment and dedication to productive, safe, and optimal patient care</td>
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<td>Difficult relationships with coworkers</td>
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<td><strong>Personal</strong></td>
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traits are often idealistic and have perfectionist qualities that may lead them to submerge themselves in their work and devote themselves to it until they have nothing left to give. Thus, commitment to patients, attention to detail, and recognizing the responsibility associated with patients’ trust—the very traits that define a good surgeon—also place surgeons with these qualities at greater risk for burnout.

A number of studies have explored the potential causes of physician burnout. These studies suggest that a lack of autonomy, difficulty balancing personal and professional life, excessive administrative tasks, and high patient volume are the greatest sources of stress. The way these and other work characteristics affect a given individual is complex and depends on his or her personal responsibilities (eg, relationships, age of children, other interests), personality, health, and enthusiasm for work. Recognizing these variables, there nevertheless appears to be some common themes among physicians and surgeons who experience burnout. A partial list of potential contributing causes is given in Table 2.

Long hours and lack of control over one’s schedule during medical school, residency, and fellowship may also inculcate surgeons (and physicians from other medical specialties) with a set of habits that are counterproductive to achieving a balanced and full life once training is completed. During this time, a coping strategy that puts achieving a balanced and full life until retirement.4,42 Once developed, many physicians maintain this strategy of delayed gratification after completing a residency or fellowship and rather than reclaiming their personal life, they find themselves delaying this task ever further into the future (eg, until after establishing their practice or becoming an associate professor). In fact, many physicians appear to believe they cannot simultaneously have a fulfilling personal and professional life, so they put their personal life on hold until retirement.

Although the total number of hours worked by surgeons has not been found to be an independent predictor of burnout in most studies, most surgeons work more than 60 hours per week. For example, 89% of surgical oncologists profiled in the study by Kuerer et al worked more than 50 hours per week, whereas 60% and 24% work more than 60 and 70 hours, respectively. This finding is in contrast with the average US workweek of 34.5 hours as reported by the US Bureau of Labor. Thus, the nearly uniformly long hours worked by surgeons may limit the ability to evaluate the relationship between hours worked and burnout.

### WELLNESS

Although recovery from burnout is possible, prevention is a better strategy. Physicians who actively nurture and protect their personal and professional well-being on all levels—physical, emotional, psychological, and spiritual—are more likely to prevent burnout or at least to mitigate its consequences. The promotion of personal wellness needs to occur throughout the professional life cycle of physicians, from medical school through retirement. Promoting such balance and well-being is a challenge that must be addressed not only by individual physicians but also by our professional organizations and in our workplace. Indeed, the leadership of institutions, departments of surgery, and professional societies should encourage and identify workplace activities and characteristics that encourage a balanced lifestyle. The importance of mentorship cannot be underestimated.

Bringing about personal growth and renewal involves optimizing a sense of meaning at work and in personal life. Strategies that may help increase wellness for individual surgeons include participating in research, continuing educational activities outside work, paying particular attention to important personal relationships and spiritual practices, recognizing the importance of one’s work, cultivating personal interests outside work, and creating a balance between personal and professional life. (Table 3). Each of us has a unique com-

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### Table 2. Partial List of Contributing Causes to Physician Burnout

- Length of training and delayed gratification
- Limited control over the provision of medical services
- Long working hours and enormous workloads
- Imbalance between career and family
- Feeling isolated or loss of time to connect with colleagues
- Financial issues (salary, budgets, managed care, etc)
- Grief and guilt about patient death or unsatisfactory outcome
- Insufficient protected research time and funding
- Sex- and age-related issues
- Inefficient and/or hostile workplace environment
- Setting unrealistic goals or having them imposed on oneself

### Table 3. Steps to Promote Personal Well-Being

- Identify personal and professional values and priorities
- Reflect on personal values and priorities
- Strive to achieve balance between personal and professional life
- Make a list of personal values and priorities; rank in order of importance
- Make a list of professional values and priorities; rank in order of priorities
- Integrate these 2 lists
- Identify areas where personal and professional goals may be incompatible
- Based on priorities, determine how conflicts should be managed
- Enhance areas of work that are most personally meaningful
- Identify areas of work that are most meaningful to you (patient care, patient education, medical education, participation in clinical trials, research, administration)
- Find out how you can reshape your practice to increase your focus in this area/these areas
- Decide whether improving your skills in a specific area would decrease your stress at work or whether seeking additional training in this or other areas would be helpful for you
- Identify opportunities to reflect with colleagues about stressful and rewarding aspects of practice
- Periodically reassess what you enjoy most about your work
- Identify and nurture personal wellness strategies of importance to you
- Protect and nurture your relationships
- Nurture religion and spirituality practices
- Develop hobbies and use vacations to pursue nonmedical interests
- Ensure adequate sleep, exercise, and nutrition
- Define and protect time for personal reflection at least once a month
- Obtain a personal primary care physician and seek regular medical care
bination of activities that can be self-renewing and energizing, which will change as we go through various phases of our career and life. A new way of thinking about work is required: viewing it not merely as a domain of energy expenditure but also as a potential source of energy renewal (eg, facing and overcoming challenges, deriving meaning in work).

**NEED FOR MORE RESEARCH**

A limited amount of information exists about the relationship between demographic characteristics and burnout among physicians and surgeons. There also has been a limited investment of financial resources in understanding the surgeon’s workplace environment (especially outside professional and safety issues) and how to improve it. Physician depression and suicide, devastating consequences of physician stress, have received scant research attention. Additional research in these areas is needed to elucidate evidence-based interventions at both the individual and organizational levels that would benefit the individual surgeon and indirectly affect patient safety (Table 4).

Although stress and burnout are at the negative end of the quality-of-life continuum, satisfaction and well-being are at the positive end. Similar to burnout, little is known about the characteristics associated with the achievement of personal satisfaction in the practice of surgery. Factors that may reduce satisfaction with career choice among surgeons include the aforementioned challenges that are unique to caring for seriously ill patients and a number of changes that have emerged in the practice environment in recent years, including increased workload, increased governmental oversight, decreased insurance reimbursement, decreased autonomy, and the complex demands of office management.4,7,38,49 Despite the significant stress experienced by some surgeons, others appear to thrive and achieve a high degree of satisfaction with their work and overall quality of life. The personal and professional characteristics associated with achieving personal satisfaction in the practice of each surgical specialty are not fully known.7

**CONCLUSIONS**

Physicians pursue the arduous task of becoming surgeons to change the lives of individuals facing serious health problems, to experience the joy of facilitating healing, and to help support those patients for whom medicine does not yet have curative treatments. Despite its virtues, a career in surgery brings significant challenges that can lead to substantial personal distress for the individual surgeon and his or her family. Each surgeon should continuously map a career pathway that integrates personal and professional goals with the outcome of maintaining value, balance, and personal satisfaction throughout his or her professional career. Being proactive in avoiding burnout is preferable to reacting to burnout after it has damaged one’s professional life or personal wellness.

There is no single formula for achieving a satisfying professional career. Each of us will have to deal with stressful times in our personal and professional lives; we must cultivate habits of personal renewal, emotional self-awareness, and connection with colleagues and support systems and must find genuine meaning in work to combat these challenges. As surgeons, we also need to set an example of good health. To provide the best care for our patients, we need to be alert, interested in our work, and ready to provide for the patient’s needs, which means doing everything we can to stay as healthy as we want our patients to be. Maintaining these values and healthy habits is the work of a lifetime.

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