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Chapter

# Wellness in Residency: A Paradigm Shift

*Roderick M. Quiros and Elspeth Black*

## Abstract

There has been a cultural shift in the state of residency training over the past two decades. While the traditional view of trainees heavily emphasized the service component of residency, training programs are gaining an increasing awareness of the trainees' well-being as crucial to their functioning, the success of the training program, and ultimately, to the care of patients. To this end, work-hour limitations have been imposed universally. Additionally, some programs have established interventions that allow residents to lead balanced lives with emphasis on time away from work, sleep, and outside activities. A paradigm shift recognizing the importance of wellness in residency may reduce the risk of physician burnout in the long term.

**Keywords:** residency, training, wellness, well-being, burnout

## 1. Introduction

The notion of the physician as an agent by which health is maintained or restored is an archetypal one. While it is a noble image, it does not address the possibility that the physician's own health may be compromised, even as he or she works in the service of patients. Physicians in training are at risk for depression; continued stressors after completion of residency have elevated the risk of suicide in physicians compared to the general population. Furthermore, the rate of death by suicide is approximately 70% higher for male physicians compared to men in the general population, and between 250 and 400% higher for female physicians than women in the general population [1]. These numbers are startling and should initiate widespread changes in how we train our future physicians, but they are far from new data. A brief literature review will reveal similar statistics published in the 2000s, the 1990s, the 1980s, and nearly every decade before that for over a century [2].

It has also been demonstrated that there is a preponderance of burnout in medicine that is greater than that of the general US working population. Nearly half of all US physicians report at least one symptom of burnout, and physicians were more likely than their non-physician counterparts to be dissatisfied with work-life balance (approx. 40 vs. 23%) [3]. Especially pertinent in these times of the US physician shortage are the statistics demonstrating that those on the front lines of primary care are more at risk. Even after adjusting for demographics and such frequently blamed characteristics such as hours worked per week and call schedule, physicians practicing emergency medicine, general internal medicine, and family medicine remained at higher risk of burnout [3]. It is thought that the US loses approximately 1 doctor every day to suicide, and assuming the average family

physician patient panel is 1500 patients (which is a low estimate), the extrapolated public health crisis is that over ½ million patients in the US per year are losing their physicians due to suicide [2, 4, 5]. This number does not include doctors lost due to insurance changes, natural death, moving, and the litany of other reasons that patients lose continuity care with their primary care providers.

The US healthcare system could benefit from changes across the board, but the specific malady of physician wellness is treatable. The current culture of medical training promotes a strong, resilient-to-a-fault façade that contributes to a perceived negative stigma toward receiving help for burnout and depression [6, 7]. By shifting the way medical students and residents are recruited, mentored, and trained, the culture should gradually shift to one of encouragement rather than one of punition. Making this change requires an understanding of the journey to becoming a physician.

### 1.1 The risk of burnout is inherent from the start

The first step in becoming a physician is acceptance into medical school. This is achieved by being an elite, well-rounded student with excellent exam scores. The selection process tends to favor highly motivated students who are at the top of their class [7]. Interestingly, while students entering medical schools are no different from their non-medical peers in terms of their mental health, their overall mental health state starts to decline soon after they begin their medical studies [8]. Once in medical school, the student experiences the so-called firehose of information that composes the first 2 years of medical school. While attempting to learn this extremely broad and detailed material, the competition continues; one is expected to excel at coursework while also getting involved in research and interest groups for the specialties for which one may apply. In the 3rd and 4th years of medical school, the students are thrust into the clinical hierarchies of the hospital education system. It is expected that the 3rd year student will come in early and leave late while trying to learn as much as possible and trying to impress their senior staff who may eventually write their recommendation letters. The 4th year medical student may gain some comfort as he or she develops some mastery in the workflow of their training and after matching into the residency of their choice. Comfort may be short lived as the young doctor catches sight of the true summit as they begin their intern year, and the road seems to be stretching limitlessly ahead yet again.

An interesting phenomenon that begins to occur in medical school, but that is not exclusive to the field of medicine, is the imposter syndrome (IS). This is a state characterized by feelings of self-doubt and fear of being outed as an intellectual fraud, despite direct evidence to the contrary. Affected individuals experience an inability to feel accomplished in their field and that they are lacking the competency that others perceive them to have [7]. Studies show that approximately 25% of male medical students and nearly 50% of female medical students experience IS. The experience of IS is significantly associated with burnout, which leads one to ponder what influences in the medical education system are leading so strongly to both burnout and IS. Some suggest it is the milieu of competition in the setting of shame-based learning and the overall teaching style that contribute to their growth [7].

Upon graduation from medical school and at the start of residency, growth and learning again occur logarithmically. While the vast majority of residents complete their respective programs, the intensity and duration of training can take a toll on the resident's well-being. Some programs in particular may seem to struggle with resident wellness, and seeds of discontent quickly spread among the trainees. This in turn can lead to the training institution being labeled a "malignant program" among the network of residents. A malignant residency program is one where the residents feel

overworked and undervalued, shifts are long, days off are rare, duty hour rules are constantly flouted, residents feel demeaned and disrespected, faculty are disinterested and/or belligerent, and the light at the end of the tunnel frequently feels very far away. One can logically conclude that at these programs, one would find the ultimate environment for burnout. Research in this area is strongly lacking, most likely due to the lack of reporting. There is a culture of fear and silence in these programs, as the resident who reports their own program perceives themselves to be knowingly putting their own career at risk. Thus, the term "malignant program" is found everywhere in the blogosphere but is exceptionally rare in the medical literature [9–11].

With a clear link between physician burnout and the public health crisis of the consequence of that burnout, it is important that we can measure the burnout severity and make appropriate recommendations to those identified at highest risk. Before we can measure burnout, we must first understand what it is. As defined by Christina Maslach, burnout is a syndrome characterized by a loss of enthusiasm for work (emotional exhaustion), feelings of cynicism (depersonalization), and reduced personal accomplishment [12]. There has been a lot of focus both in the popular press as well as in medical literature about monitoring, defending against, and eradicating burnout. There has been much less focus on the defining of, education in, and promotion of physician wellness [13]. This makes for a conundrum where students may know what to avoid but not necessarily be equipped to navigate between the pitfalls. Educators may promote behaviors like "self-care" and encourage students to get enough sleep without necessarily laying out a plan by which their students could accomplish these goals.

Eckleberry-Hunt and colleagues describe the promotion of wellness through changing the culture of medicine. They defined wellness as "a dynamic and ongoing process involving self-awareness and health choices resulting in a successful, balanced lifestyle" [13]. Tenets of wellness need to be woven into the fabric of medical education, just as clearly emphasized as those of professionalism and patient safety. The means for incorporating wellness into residency training may lie in the establishment of a curriculum that objectively measures resident wellness and identifies and addresses potential burnout. Ultimately, such a curriculum would contribute to career longevity long after completion of residency.

## 2. Physician training: the traditional model

While the concept of a physician in training has always included both a service component (to the patient) as well as an educational component (for the trainee rendering care), the historical model emphasized the service component to a higher degree. The expectation was that under the guidance and instruction of a more senior physician, the trainee would learn by doing; working in the trenches, so to speak, would impart on-the-job experience. Indeed, this "master-apprentice" model was the norm until the late nineteenth century, with trainees often starting in their teenage years. The pupil was expected to learn by directly observing, then imitating the master's technical and clinical skills. While seemingly personal in that the relationship between mentor and mentee was an individualized, tailored one, the disadvantage to this was that there were no standardized guidelines as to what knowledge was to be imparted or for how long training was to last.

In the 1890s, Sir William Osler introduced bedside rounds with students at the Johns Hopkins School of Medicine. This was a break from the standard practice, as direct patient contact was thought to be beyond the skills of students. Soon after, William Halstead, Osler's surgical counterpart, took over the department of surgery at Johns Hopkins and decided to incorporate principles of basic science into the clinical

curriculum. The Halstead model for training emphasized recurrent opportunities for trainees to take care of patients under supervision of a skilled teacher, married to the need for the trainee to understand the scientific basis of disease and the need for the trainee to acquire skills in management of increasing complexity with graded responsibility and ultimately, independence with each advancing year [14].

While the length of training and the general graded curriculum was established both in surgical and medical specialties, the balance between service and education was weighted toward the former. Trainees lived up to the name "residents" who were expected to be ever present in hospital and available for continuous patient care. This was the expectation for the last century, and while the system did have its advantages, namely, nearly continuous immersion in the clinical arena (and presumably continuous learning), it did have its share of problems as well in that it tended to dehumanize the trainee to the detriment of caregiver and patient alike. The resident was expected to work tirelessly, often at the expense of his/her personal well-being and health. Physical and mental fatigue were understood and accepted as part of the job and even an expected part of the training as it imparted a toughness to the trainee that would serve them well upon completion of their training.

### 2.1 Culture change: the impact of the Libby Zion Law

Libby Zion was a freshman college student who, in March of 1984, was admitted to a New York City hospital by her family physician for workup of flu-like symptoms which she had been experiencing for several days. She was assigned to the care of two resident physicians. The two residents could not pinpoint the cause of Libby's symptoms and ultimately prescribed meperidine to help manage the jerking motions that Libby displayed on admission. One of the residents also ordered restraints be placed on Libby and prescribed Haldol to help control agitation. At the time, both residents were covering several other patients in the hospital.

Libby ultimately fell asleep, but on the following morning, she was febrile to 107° F. She shortly had a cardiac arrest and could not be revived. Ultimately, Libby's death was attributed to the interaction of an antidepressant, phenelzine, which she had been taking prior to admission to the hospital, with the meperidine given to her by the residents. The combination led to development of serotonin syndrome, which is associated with increased agitation and fever. The fever progressed to the point of causing cardiac dysfunction and arrest.

Libby's parents were convinced that her death was due to staffing problems at the hospital. Libby's father Sidney took issue with the long hours, and residents were working at the time of her death as he believed that residents working a 36-hour shift were incapable of making medical judgment calls. The residents in this case had prescribed a medication that ultimately led to an untoward effect by interaction with the patient's own medication. They also ordered restraints for her when she progressively became agitated. Sidney attributed these errors in part due to the residents working prolonged shifts and making erroneous judgments due to fatigue [15]. These events culminated in a lawsuit against the residents.

The case ultimately became a high-profile legal battle with multiple charges brought against the residents involved. Ultimately, after several years of litigation, charges against the residents were dropped. Additionally, the court completely cleared the records of the two residents of findings that they had provided inadequate care [16].

The case put the spotlight on the effect of resident work hours on patient care and led to the formation of a panel of experts headed by Dr. Bertrand Bell from the Albert Einstein College of Medicine, another New York institution. This committee, which became known as the Bell commission, evaluated the training of doctors in

New York State and ultimately made a series of recommendations based on their findings. In 1989, New York State adopted the Commission's recommendations that residents could not work more than 80 hours a week or for more than 24 consecutive hours. In 2003, the Accreditation Council for Graduate Medical and Education (ACGME) adopted similar regulations for all accredited medical training institutions, regardless of specialty [17].

### 2.2 The ACGME and the 80-hour work week

Before the adoption of such regulations, it was understood that physicians in training would commonly work between 80 and 100 hours per week, sometimes more, as a matter of routine. While a portion of this time was involved in direct patient care, some of those hours involved other tasks indirectly related to patient care such as paperwork. While the Libby Zion case was not directly about prolonged resident working hours, the aftermath led to scrutiny on the role of prolonged hours on residents and the patients for which they were responsible and the resulting Bell Commission's recommendations. Residents on call are expected to be available at all times during their 24 hour shifts while in hospital, and, if particularly busy, may be awake for the full 24 hours of the shift. A survey of 1st and 2nd year residents revealed that 66% of respondents got 6 hours or less of sleep per night, while 20% got 5 hours or less of sleep per night [18]. Presumably, this sleep schedule applies to days when the residents are not on call/or in hospital.

The expectation that physicians in training were to be near constantly available was in part based on the assumption that residency positions are limited and highly desired; residents therefore willingly subject themselves to such a work schedule. Getting through residency, particularly the ones with highly demanding schedules and workloads, was a sign of toughness and a badge of honor. Additionally, the continuity of care of the patient, which is conceptually sound, can lead to prolonged hours, and a physician accepting a patient early in their shift may be compelled to follow that patient's care well beyond the end of their shift in order to follow through with any patient-related issues [19].

The case against the "old school" schedule present before the start of the 80-hour workweek in 2003 is based in part on the decline of physician performance from mental and physical fatigue resulting from sleep deprivation. Multiple studies have shown that residents who are chronically sleep-deprived are acutely at higher risk for personal harm such as motor vehicle accidents, as well as work-related injuries like sharps injuries or needlesticks. Over the long term, lack of sleep can also put physicians both in training and beyond at higher risk for cardiovascular disease, being overweight, or diabetes [20].

Resident sleep deprivation adversely affects trainees both mentally and physically, which may translate into poorer patient outcomes. In a meta-analysis of 959 physicians, a 24 to 30-hour continued state of being awake without sleep decreased physicians' overall performance by almost 1 standard deviation and clinical performance by more than 1.5 standard deviations [21]. A web-based survey by Barger et al. showed that interns committed significantly more fatigue-related medical errors culminating in adverse patient outcomes on months with five or more overnight calls than with months with no extended shifts [22]. Another study showed the effects of sleep deprivation on residents' technical skills; surgical residents who had been awake the previous night made 20% more errors and took 14% longer to complete a simulated laparoscopic task than their colleagues who had slept well the previous night [23]. A study found that after 24 hours of sustained wakefulness, hand-eye coordination decreased to a level equal to the performance observed at a blood alcohol concentration of roughly 0.10% [24].

In 2003, under pressure from OSHA (the Occupational Safety and Health Administration) and other regulatory bodies, the ACGME responded to these and other data by crafting mandatory duty hour requirements for all ACGME-accredited training programs. First, the number of hours that trainees would be capped is at 80 hours per week, averaged over 4 weeks, and inclusive of all in-house call activities. Residents were to receive a minimum 10-hour rest period between duty periods and after in-house call. Call itself could not exceed a 24 hour limit. However, while residents could not receive new patients after 24 hours of continuous duty, there are allowable provisions of up to 6 hours for continuity of care or for education. Residents were to have 1 day a week off, averaged over 4 weeks. Finally, there has to be an in-house call no more than once every 3 nights, averaged over 4 weeks.

Early data after the institution of the 80-hour workweek seemed to show a benefit to the new guidelines. In 2004, one study that found reducing sleep deprivation significantly reduced errors in intensive care units [25]. This study from The Brigham and Women's Hospital study was a prospective, randomized study comparing the rates of serious medical errors made by interns while they were working according to a traditional schedule with extended (24 hours or more) work shifts every other shift (an "every third night" call schedule) and while they were working according to an experimental schedule that eliminated extended work shifts and reduced the number of hours worked per week. Adverse incidents were identified by means of a multidisciplinary approach that included direct, continuous observation where two physicians blinded to the interns' schedule assignments independently rated each incident. During a total of 2203 patient days on 634 admissions, interns made 35.9% more serious medical errors during the traditional schedule than during the experimental schedule. The rate of serious errors on the critical care units was 22.0% higher during the traditional than during the experimental schedule. Interns made 20.8% more serious medication errors during the traditional than during the experimental schedule. Interns also made 5.6 times as many serious diagnostic errors during the traditional as during the experimental schedule. The authors concluded that interns made substantially more serious medical errors when they worked frequent shifts of 24 hours or more. Based on their data, the authors recommended eliminating extended work shifts and reducing the number of weekly hours in order to reduce medical errors in the intensive care unit.

In the years after the ACGME adopted the 80-hour workweek, these restrictions were again scrutinized. In 2008, the common duty hour requirements instituted in 2003 had been in effect for five years, and the ACGME was prepared to refine their recommendations. Ongoing investigation of interns in particular resulted in a further reduction in work hours for that subset of trainees, so that in 2011, the number of continuous hours an intern could work was reduced to 16. This rule affected more senior residents and some faculty who, with interns working fewer hours, were forced to provide more coverage. Not surprisingly, senior resident and faculty satisfaction concurrently declined after this rule was put in place.

The debate on schedule restrictions for residents is ongoing. Several questions remain unanswered, as more recent data on the beneficial effects of hour reduction are mixed. Are 80 hours a week appropriate or even too much? Other countries besides the US place limits ranging from 37 hours per week in Denmark to 48 in the European Union [26]. Are residents missing valuable experiences monitoring the course of illness with their patients? There is an old saying in surgical training that the problem with every-other-night call is that the resident misses half of all the interesting cases in the hospital; clearly this sentiment originated well before 2003. While the average person may agree that 8 hours of sleep per night may be ideal, the corollary question as it applies to residency training is, "What amount of time for rest and recovery does a person need between shifts?"

## 3. Resident wellness: it is more than just about hours worked

While the institution of restrictions on duty hours was thought to result in safer, higher quality medicine as well as improvements in resident quality of life, there have been unintended negative consequences to reduced working hours. Bolster and Rourke reviewed papers published between 2010 and 2013, specifically on interventions made as a result of duty hour restrictions (such as night float systems, shortened shifts, and protected time for sleep) and measured the effects of the interventions on patient care, resident well-being, and resident education [27]. They found that frequently, the studies as a whole concluded that the restrictions had no impact on patient care (50%) or resident wellness (47%), and actually had a negative impact on resident education (64%). The night float system was the most universal way of implementing duty hour restrictions, though ironically it was actually associated with the highest proportion of unfavorable findings. The authors concluded that a focus on duty hours alone did not result in consistent improvements in patient care or resident well-being and that the added duty hour restrictions implemented in 2011 appear to have had an unintended negative impact specifically on resident education. They concluded that residents missed educational opportunities, including requisite teaching conferences, on their required time out of the hospital.

Another systematic review among surgical programs showed an inconsistent effect of restricted resident duty hours on resident wellness and a negative impact on patient outcomes and performance on certification exams [28]. This study included papers written between 1980 and 2013. Articles that examined mortality data were combined in a random-effects meta-analysis to evaluate the impact of resident duty hours on patient mortality. There was no overall improvement in patient outcomes as a result of reduced resident hours; however, some studies suggest increased complication rates in high-acuity patients. There was no improvement in education related to duty hour restrictions, and surprisingly, performance on certification examinations actually declined in some specialties. Additionally, while there were collective improvements in resident wellness after the institution of the 80-hour workweek in 2003, there was little improvement and even some negative effects on wellness after the 16-hour duty maximums were implemented in 2011.

One of the concerns for training programs after the institution of resident duty hour restrictions is that some residents may adopt a "shift mentality" where one simply clocks in and out of work. This tendency challenges notion of physician professionalism where the trainee sees the case through to the end and maintains continuity of care. Training with the shift mentality does not reflect life after residency when the 80-hour restriction no longer applies. Part of the solution may be not just a reduction in duty hours but allowing flexibility in managing resident schedules in a way that patient care, resident wellness, and education are least adversely affected. The Flexibility in Duty Hour Requirements for Surgical Trainees (FIRST) Trial involved 117 American general surgical residency programs and was conducted to test whether surgical patient outcomes under flexible, less-restrictive duty hour policies would be non-inferior to those under standard ACGME policies [29]. Programs were randomized to current ACGME duty hour policies or more flexible policies that waived rules on shift lengths and time off between shifts. Outcomes included the 30-day rate of postoperative death or serious complications (primary outcome), other postoperative complications, and resident perceptions and satisfaction regarding their well-being, education, and patient care. The authors reported that flexible, less-restrictive duty hour policies were in fact not associated with an increased rate of death or serious complications (9.1% in the flexible-policy group and 9.0% in the standard-policy group) or of any secondary postoperative

outcomes studied. Among the 4330 residents in the study, those in programs assigned to flexible policies did not report significantly greater dissatisfaction with overall education quality (11.0% in the flexible-policy group and 10.7% in the standard-policy group) or well-being (14.9 and 12.0%, respectively). Residents under flexible policies were less likely to perceive negative effects of duty hour policies on multiple aspects of patient safety, continuity of care, professionalism, and resident education, though they were more likely to perceive negative effects on personal activities compared to those in the standard-policy group. There were no significant differences between study groups in resident-reported perception of the effect of fatigue on personal or patient safety. Residents in the flexible-policy group were less likely than those in the standard-policy group to report leaving during an operation (7.0 vs. 13.2%) or handing off active patient issues (32.0 vs. 46.3%). The authors concluded that less-restrictive duty hour policies for residents were equivocal regarding patient outcomes and lacked significant difference in residents' satisfaction with overall well-being and education quality, when compared to standard duty hour policies.

## 4. Reactive to proactive: promoting wellness

The reduction in resident work hours may be construed as a passive intervention in that resident well-being has been thought to benefit from time simply away from work. As such, the changes made by the ACGME were largely reactive to the data from the 1980s to 1990s showing adverse effects for unlimited work hours on both patients and residents. Over the last decade however, the concept of physician burnout has gained more prominence. This is an issue that undoubtedly can affect resident physicians but which can affect the physician well beyond residency into practice. Pursuing physician wellness has therefore become a more proactive endeavor thought to extend beyond simply cutting hours worked, since the 80-hour restrictions do not apply in post-residency training.

In an analysis done at the Mayo Clinic, 7288 physicians were surveyed on their quality of life and job satisfaction [3]. The data revealed that 46% of respondents reported at least one burnout symptom. The report indicates that physicians both as a group and relative to other highly educated individuals working long hours suffer high levels of emotional exhaustion and struggle to find a satisfying work-life balance.

Unlike depression, which affects a person's life at home as well as at work, burnout generally refers to a constellation of symptoms specific to the workplace. Symptoms include depersonalization (a tendency to perceive and treat people like objects), a loss of a sense of personal accomplishment, and mental and emotional fatigue. By its nature, medicine as a profession attracts people who are drawn to service, even if it means self-sacrifice. Most physicians are inclined to do what is necessary to take care of patients, which in the long term can lead to fatigue and burnout. The Mayo clinic report showed that burnout was not limited to any one particular specialty, but that notable differences in burnout were observed, with the highest rates among physicians at the front line of care access (family medicine, general internal medicine, and emergency medicine). Despite this report, it must be emphasized that burnout was seen across all specialties to a varying degree.

The present generation of trainees, as well as senior staff responsible for their training, is being exposed to the concept of wellness more and more as it becomes integrated into the training culture and curriculum. The idea of wellness in residency, if not universal at present, is more commonly becoming a core element in training. There is some understanding that the best way to take care of one's patients is to take care of one's self.

### 4.1 Wellness in training and beyond

In 2015, the ACGME formed a committee to comprise of 29 residents and fellows of various specialties to study resident wellness in the present state of training, propose the ideal learning environment to promote wellness, and determine how to bridge the differences between the two [30]. The council concluded that policies in training programs should increase awareness of the stress of residency, destigmatize the diagnosis of depression in trainees, develop ways to identify and treat depression confidentially to encourage trainees to get help, enhance mentoring by senior peers, promote a supportive culture, and encourage continuing study to deepen understanding of wellness. To this end, several residency training programs across the US have incorporated various resources to promote wellness. Generically, these include burnout prevention by formally emphasizing healthy eating, exercise, and mindfulness. Identifying signs and symptoms of burnout are stressed, as are resources to help manage them, such as mental health services. They also include scheduled recreational events with colleagues away from work, as well as the institution of a mentoring program with more senior residents or faculty. Some programs help with financial planning to address stress associated with monetary issues.

Social support, both professionally and personally, is a major pillar in preventing and combating burnout [31]. While conflicts between professional demands and home and family life may be a stressor contributing to burnout, and that married women in particular may be more affected by these conflicts, some data show that marriage is likely to reduce the risk overall [32, 33]. Balch and colleagues reviewed a number of studies on the causes of burnout in physician training and beyond in an attempt to increase awareness of burnout and help identify ways to curb risk starting in residency (**Table 1**) [34]. In a follow-up study, Balch and colleagues sent out a cross-sectional survey to members of the American College of Surgeons [35]. The survey included questions about physicians' own health habits, routine medical care practices, personal wellness strategies, and assessments of burnout. From data collected from 7197 respondents, the most effective behaviors associated with lower burnout risk were incorporating wellness strategies that include finding meaning at work, focusing on what is important in life, maintaining a positive outlook and attitude toward professional life, and understanding that work-life balance may decrease risk of burnout and improve quality of life. More specific, tangible findings included increasing weekly exercise training to levels recommended by the

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| • 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 of 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 1.**
*Partial list of contributing causes to physician burnout (Originally Table 2 from Balch et al. [34]).*

Center for Disease Control, undergoing annual visits to one's primary care provider, and undergoing age-appropriate preventative testing, though the authors acknowledge that is uncertain if these measures are characteristics of surgeons who place a greater emphasis on self-care or if they are concrete ways to reduce burnout.

Paradoxically, burnout may mostly affect those physicians who are dedicated to their patients to the point of being "generous to a fault." The importance of empathy in medicine cannot be overstated, yet there is some question as to the actual relationship between empathy and burnout. Zenasni and colleagues presented possible ideas relating the two [36]. First, burnout is an "empathy killer"; when physicians tend toward burnout, they also tend to withdraw from relationships with patients as a defense mechanism to restore psychological balance. The authors also propose that empathy may create burnout as empathy at high levels predispose to "compassion fatigue" which can progress to burnout. The final hypothesis they present is that empathy can prevent burnout. The empathic physician has an awareness of negative emotions, requiring self-reflection and the need to be able to accept negative feedback, both of which are skills protective against burnout. More recently, Wilkinson and colleagues preformed a systematic review to clarify the relationship between empathy and burnout [37]. Their meta-analysis consisted of 10 studies, 8 of which were suggestive of a negative relationship between burnout and empathy; 1 study showed a positive relationship between the two; and lastly, 1 had both positive and negative correlations between burnout and empathy. While the majority of studies pointed toward a negative association between burnout and empathy, the authors concluded that additional research to establish causality was needed since all the included studies were cross-sectional.

## 5. Conclusion

Residency is both a demanding and rewarding experience for those entering the medical field. It is the training ground where physician education is intertwined with service to the patient and where a balance between formation of a sound and well-prepared clinician and a mentally and emotionally fit person as caregiver is struck. The last three decades have seen a shift from residents as a large service component in the healthcare system to persons whose well-being affects themselves, their colleagues, and their patients. Initiation of wellness training begins in residency, but principles espoused in such programs should be applied well beyond the end of training into professional life. In the following chapter, we will review the Maslach Burnout Inventory and the Utrecht Work Engagement Scale as objective means of measuring physician burnout. As a practical application, we will discuss a resident wellness curriculum in our own institution designed to recognize and prevent burnout and to promote physician well-being.

## Conflict of interest

The authors of this work have no conflicts of interest to declare.

*DOI: http://dx.doi.org/10.5772/intechopen.82343*



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