

Evidence-Based Interventions for Medical Student, Trainee and Practicing Physician Wellbeing: A CHARM Annotated Bibliography

For the Collaborative for Healing and Renewal in Medicine (CHARM) *Best Practices Subgroup*

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INTRODUCTION

The clinical and academic development, as well as wellbeing, of medical trainees is fundamental to the delivery of American health care. Students, residents and fellows are central to care teams in many hospitals and clinics, and possess the medical knowledge, curiosity, idealism and compassion necessary for successful clinical outcomes and continued advancement of scientific knowledge. Young doctors are the talent pool from which academic and community institutions alike find the staff clinicians, educators, researchers, policy makers and administrators of the future.

There is increasing recognition that the burnout affecting practicing physicians may significantly impact students and trainees. The reasons for practicing physician burnout are variable and complex, and range from unsustainable workloads with increasing regulatory and administrative demands, to tensions between work and home, poor systems of practice support, chaotic work environments, EHR-related problems, work compression, lack of alignment with leadership and lack of time and strategies for self-care. Trainees struggle with similar workplace challenges, and also face unique sources of stress and distress, such as sleep impairment, fear of failure and negative evaluations, competency issues, relocation, financial challenges, and minority, gender and cultural concerns.

The consequences of trainee burnout are undeniable. Medical students with burnout are more likely to engage in unprofessional behaviors, lose altruistic professional values, have serious thoughts of dropping out of school, misuse alcohol and have suicidal thoughts. Residents with burnout are more likely to commit medical errors, deliver suboptimal care, feel dissatisfied with their careers, consider changing specialty or leaving the profession, experience suicidal thoughts and may even have a higher rate of motor vehicle accidents and needle stick injuries. Studies also suggest burnout can impair concentration, impede cognitive processes needed for knowledge and skill acquisition and application, and negatively impact medical knowledge and clinical reasoning. In short, burnout negatively impacts learning, as well as personal and professional identity formation.

In response to the current burnout crisis, the Collaborative for Healing and Renewal in Medicine (*CHARM*) was formed in January of 2016, in association with the Alliance for Academic Internal Medicine (AAIM), for the specific purpose of analyzing trainee wellness and burnout, exploring interventions to reduce it, and identifying goals for faculty development and further research. Co-chaired by Drs. Hasan Bazari and Jonathan Ripp, *CHARM* is presently summarizing best practices, promoting investigation of the impact of learner burnout, developing tools for educators to address learners in distress and advocating for the recognition and inclusion of initiatives that foster wellbeing among learners.

The *CHARM* Best Practices subcommittee was charged with cataloguing and summarizing published strategies for improving wellbeing and decreasing burnout among medical students and trainees. However, given the widespread prevalence of physician burnout beyond training and the closely intertwined impact of senior physician burnout on team dynamics and junior team-member wellbeing, we have also summarized the intervention literature as it relates to practicing physicians. Interventions can be individual-focused, organization-focused or a combination of both. Individual-focused strategies are more prevalent in the literature and include mindfulness-based approaches, stress management, resiliency and self-care training, facilitated and non-facilitated small group curricula and communication skills training. Organization-focused interventions include shortened attending rotation length, shortened resident shifts, resident duty hour restrictions, protected naps on overnight shifts, and various practice delivery changes.

Several recent meta-analyses have confirmed clinically meaningful reductions in overall physician burnout, emotional exhaustion and depersonalization with both individual and organizational strategies, with newer data suggesting organization-focused efforts might in fact be more effective. What is clear from the literature is that physician wellbeing is a *shared* responsibility. Significant system-level changes that address the root causes of burnout must be implemented at each level of the profession; without these improvements, individual efforts, no matter how intensive, will be futile. Similarly, each of us must take responsibility for our own physical, emotional and spiritual health, and take an honest and compassionate look at how our own behaviors and cognitive distortions may be contributing to our burnout. Without doubt, further research into novel organizational strategies, combined approaches, local mitigating factors and trainee-specific strategies is needed.

What follows is an annotated collection of articles summarizing best practices to reduce burnout and improve wellbeing at all levels of our profession. Interventions are organized in five broad content areas: physical health (subsections: general physical health, health-care utilization, sleep, nutrition and exercise), emotional health (subsections: mindfulness, mind-body training, stress management, and individual counseling services), facilitated groups (subsections: narrative medicine/reflection, Balint/small group work), active self-improvement (subsections: positive psychology, coaching/development and communication training) and organization transformation (subsections: program-level, system-level and culture change). Recent large systematic reviews of burnout interventions are included in the introduction. When appropriate, we separated each subsection into *Medical Student*, *Resident/Fellow* and *Practicing Physicians*. Citations are listed in reverse chronological order, from most recent to oldest within each subsection.

Our goal is to provide a summary of current research not only for medical schools and residency/fellowship programs, but also for health-care system leaders and policy makers at large. We hope to inform the growing national conversation about physician and trainee burnout, and encourage further research to define the most effective ways to help the profession reconnect with what is meaningful for its continued growth and for its own wellbeing. This bibliography is also a reminder that programs are not alone in facing these challenges, and that the collective wisdom of decades of medical educators, practicing clinicians and researchers, is an extraordinary foundation for finding effective ways to optimize our present and future work environments and reduce burnout in our profession.



Panagioti M, Panagopoulou E, Bower P, Lewith G, *et al.* Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis. *JAMA Intern Med* 2017;177(2):195-205.

doi:10.1001/jamainternmed.2016.7674.

Impetus: Prior to this publication, there was emerging data that both individual and systems-level interventions had a modest, but significant impact on physician burnout. This meta-analysis sought to compare individual and organization-focused solutions, and to determine whether length in practice (five years or more vs. less than five years) or healthcare setting (primary vs. secondary or intensive care) impacted physician burnout.

Description: Twenty controlled studies involving 1550 physicians were included. Seven of the studies involved interns and/or residents. Organization-focused strategies included workload reduction through shortened rotation blocks or shortened shifts, protected naps during in-house overnight call, adjusted ICU staffing schedules, protected time for facilitated discussion groups and targeted projects to improve teamwork and communication. Individual strategies included mindfulness, meditation, stress management and communication training, debriefing sessions, self-care workshops, an incentivized exercise program and other facilitated small groups. Authors chose a core outcome of burnout scores in the emotional exhaustion domain. Overall, existing burnout interventions were associated with small, significant reductions in burnout. Notably, subgroup analysis suggested significantly improved treatment effects for organization-focused interventions compared with individual-focused ones. There was also a trend toward greater effectiveness with interventions delivered to experienced physicians in practice five years or more, and in primary care settings, though these group differences were not significant.

Contribution: The results of this study provide additional evidence that physician burnout is rooted in the organizational coherence of the health care system and not simply a problem of individuals. They suggest that organization-focused strategies might be more effective than individual-focused ones. While not statistically significant, there was trend toward interventions being less effective in less experienced physicians and in secondary care settings.

Cost: Varied by intervention; the authors noted that concerns about implementation and delivery costs of organization-directed interventions, especially if they involve complex and major health care system changes, might explain their scarcity.

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. doi: [10.1016/S0140-6736\(16\)31279-X](https://doi.org/10.1016/S0140-6736(16)31279-X).

Impetus: Prior to this extensive publication there was a need for a comprehensive systematic review and meta-analysis of published physician burnout interventions that used strict methodological standards to overcome the limitations and heterogeneity present in the literature.

Description: The authors performed an extensive literature review and identified 15 randomized controlled trials (716 physicians) and 37 observational studies (2914 physicians) on individual-focused and organization-focused interventions to reduce burnout. Mindfulness and stress management training and small group discussions were common individual strategies. Shortened shifts, shortened rotations and work process modifications were the organizational strategies studied. Resident physicians from various specialties were involved in half the studies reviewed. Authors found both individual and organization-focused efforts have a modest but significant effect on overall burnout, as well as on the individual domains of emotional exhaustion and depersonalization, with absolute risk reductions in the range of 10-15%. Limitations of this meta-analysis were the methodological heterogeneity of the 52 studies, the paucity of randomized studies of organizational interventions, the lack of long-term follow-up in many cases and absence of data on combined individual and organizational strategies.

Contribution: This systematic review and meta-analysis identified a modest but significant decrease in burnout with a variety of existing interventions. The authors emphasized that further research using rigorous, well-designed, generalizable studies is needed to establish which interventions are most effective

in specific populations, as well as how individual and organization-focused strategies might be combined for a potentially greater impact.

Cost: Varied by intervention.

Raj KS. Wellbeing in residency: a systematic review. *J Grad Med Educ* 2016;8(5):674-84.

doi: [10.4300/JGME-D-15-00764.1](https://doi.org/10.4300/JGME-D-15-00764.1).

Impetus: This review sought to identify predictors of resident wellbeing, to summarize interventions that promote wellbeing, and provide a framework for future research.

Description: Twenty-six studies published between 1989 and 2014 met inclusion criteria. Articles with a specific focus on duty hours were excluded. A sense of control and autonomy, the building of clinical competence, the pursuit and achievement of goals, opportunities for learning, positive feedback and positive colleague relationships were associated with greater wellbeing. Autonomy, competence and relatedness had the strongest correlations, in agreement with current psychological research on wellbeing. Sleep and time away from work were also strongly correlated. Limitations included the fact that 65% of included papers were cross-sectional analyses of factors associated with resident wellbeing, as well as a lack of a universal definition of resident wellbeing and the variety of scales used to measure the construct.

Contribution: Autonomy, building clinical competence, strong social relatedness, sleep and time away from work were strongly associated with resident wellbeing in this systematic review. The first three coincide well with the psychological research on wellbeing. Rigorous research focused on these factors is needed to better define possible interventions for improving wellbeing.

Cost: Varied by intervention.

Daskivich TJ, Jardine DA, Tseng J, *et al.* Promotion of wellness and mental health awareness among physicians in training: perspective of a national, multispecialty panel of residents and fellows. *J Grad Med Educ* 2015;7(1):143-7. doi: [10.4300/JGME-07-01-42](https://doi.org/10.4300/JGME-07-01-42).

Impetus: In response to the suicide deaths of two resident physicians in New York in 2014, the ACGME conducted an appreciative inquiry exercise with residents and fellows in an effort to provide concise, meaningful recommendations about wellness best practices from physicians-in-training to the GME community.

Description: Twenty-nine residents and fellows on the ACGME Council of Review Committee Residents (from geographically diverse areas and from multi-specialties) answered a series of appreciative inquiry questions about current resources for promotion of wellness in trainees, characteristics of the ideal learning environment and strategies for moving existing learning environments closer to the ideal. Qualitative analysis of individual answers identified strong consensus on overarching themes. Personal support and mentorship from peers and faculty, systems to prevent and respond to resident distress and mental health problems, and solicitation of trainee input to improve the learning environment were identified as current best practices. Ideal learning environments were characterized by destigmatizing mental health issues, community support (from peers, faculty, staff and others), mentorship, a supportive culture (in particular after bad events) and easy access to mental health services. Five recommendations about how to move learning environments toward the ideal emerged: (1) increase awareness of stress and depression in

residency, thereby destigmatizing it; (2) develop systems to confidentially identify and treat depression in trainees, and reduce barriers to accessing help; (3) enhance mentoring by senior peers and faculty; (4) promote a supportive culture, and (5) encourage further research into resident wellness and depression to better understand problem areas and highlight best practices.

Contribution: This article provides the resident and fellow perspective on current wellness best practices, which are nearly all organizational, and describes features of the ideal learning environment for the promotion of wellness. The learning environment is portrayed as a modifiable factor that may be transformed to better support physicians in training. Specific recommendations about how to improve current learning environments are provided.

Cost: The authors suggest some of the recommendations could be readily achieved through local education and culture change. Others, such as building systems to identify and treat depression, might be more costly to implement.

Linzer M, Levine R, Meltzer D, Poplau S, *et al.* Ten bold steps to prevent burnout in general internal medicine. *J Gen Intern Med* 2014;29(1):18-20. doi: [10.1007/s11606-013-2597-8](https://doi.org/10.1007/s11606-013-2597-8).

Impetus: In relation to the worsening shortage of primary care physicians in the US health-care system, this brief article summarizes primarily organization-focused interventions to decrease physician burnout in the primary clinic setting.

Description: Recommendations for combating burnout are divided into four categories: institutional metrics, work conditions, career development and self-care. Authors advocate for measurement and monitoring of physician burnout and its predictors as quality metrics, utilizing the data in a continuous quality improvement (QI) model to address predictors and eventually drive burnout down. Increasing clinic visit length to accommodate electronic documentation or adding "desktop" slots for electronic health record (EHR) work are proposed mechanisms for decreasing EHR-related stress. Suggested work environment improvements include providing sufficient clinical supplies, exam rooms and equipment; optimizing primary care panel sizes, visit length and staffing ratios using practice models and customized schedules which preserve physician work control; and maintaining a dedicated float pool to cover physicians' predictable life events. Additional recommendations include promotion of self-care as an element of professionalism, incorporating mindfulness and teamwork into clinic practice, having flexible career policies to allow part-time work and/or job sharing, and finding ways to protect time for physicians' academic pursuits and professional development.

Contribution: This article effectively describes the clinical, personal, financial and health system consequences of burnout among general internists, emphasizing the need for organizational strategies which help prevent burnout, improve the clinic environment, make primary care careers more sustainable and rewarding and attract the next generation of trainees into clinic practice. Ten recommendations directed at healthcare organizations are outlined.

Cost: The short-term costs of various interventions would be offset in the long-run if primary care faculty are retained and the need for continual recruitment of new providers could be avoided.

Regehr C, Glancy D, Pitts A, Leblanc VR. Interventions to reduce the consequences of stress in physicians: a review and meta-analysis. *J Nerv Ment Dis* 2014;202(5):353-9. doi: [10.1097/NMD.000000000000130](https://doi.org/10.1097/NMD.000000000000130).

Impetus: Over the past 10 years, there has been increasing attention focused on the role that the medical environment plays in the stress and burnout of both students and physicians. This meta-analysis examines the role of individual-based behavioral, cognitive, and mindfulness interventions in reducing physician/medical student stress and burnout.

Description: This meta-analysis study included 12 studies involving 1034 participants: four were controlled trials with physicians, four were controlled studies with medical students, and three were parallel single-group design studies with physicians. Stress and anxiety symptoms were measured by various standardized scales such as the Spielberger State Trait Anxiety Inventory (STAI), the Perceived Stress Scale (PSS), and the Profile of Mood States (POMS); burnout was more consistently measured by the Maslach Burnout Inventory (MBI). Results of the meta-analysis show that cognitive, behavioral and mindfulness interventions were associated with significantly decreased symptoms of stress and anxiety in physicians and medical students. For the secondary outcome measure of burnout, interventions incorporating psychoeducation, interpersonal communication and mindfulness meditation were associated with decreased burnout in physicians only. Limitations of this meta-analysis were the methodological heterogeneity of the studies included, and as with any meta-analysis, publication bias exists because studies with negative findings are often not published. Additionally, because single-group design studies were included in the meta-analysis for burnout interventions, the improvement in burnout scores could have been attributed to other factors, including spontaneous remission.

Contribution: This meta-analysis demonstrates that individual-based interventions based upon cognitive, behavioral, and mindfulness principles significantly reduced stress and anxiety in both physicians and medical students. While the data is not as strong for improvement of burnout, this meta-analysis provides emerging evidence that these models may also contribute to lower levels of burnout in physicians.

Cost: Varied by intervention.

Awa WL, Plaumann M, Walter U. Burnout prevention: a review of intervention programs. *Patient Educ Couns* 2010;78(2):184–90. doi: [10.1016/j.pec.2009.04.008](https://doi.org/10.1016/j.pec.2009.04.008).

Impetus: There are few papers which directly compare individual and organizational strategies to reduce burnout. A team from Hanover Medical School's Institute for Epidemiology, Social Medicine and Health System Research performed this systematic review to evaluate and compare the effectiveness of individual, organization-directed and combined burnout interventions in a broad range of medical and non-medical professionals. Authors identify work-related risk factors for burnout, including being in a "helping" profession (teaching, medicine, nursing and social work), imbalance between job demands and skills, lack of job control, effort-reward imbalance and prolonged workplace stress. They highlight the large economic losses associated with burnout because of absenteeism, sick leave, physical and mental health problems and job turnover.

Description: Primary studies between 1995 and 2007 are reviewed, with 25 included in the final systematic analysis. Level of evidence is assessed for each. Seventeen studies tested individual-based strategies, with 82% showing significant reduction in burnout or a positive impact on risk factors that persisted 6-12 months

depending on the study. Two studies tested purely organizational interventions, one of which reduced burnout for a year. All six studies of combined interventions showed significant positive effects on burnout, 80% lasting up to one year. Half of the combination studies were assigned the highest level of evidence.

Contribution: This systematic review directly compared individual, organizational and combined approaches for reducing burnout, with an emphasis on effect duration. While acknowledging the wide range of study designs as the major limitation, authors conclude a variety of burnout intervention programs are beneficial; however, combined approaches seem to most positively influence burnout and worksite mental health.

Cost: Varied by intervention.

PHYSICAL HEALTH INTERVENTIONS

General Physical Health Interventions

Kushner RF, Kessler S, McGaghie WC. Using behavior change plans to improve medical student self-care. *Acad Med* 2011;86(7):901-906. doi: [10.1097/ACM.0b013e31821da193](https://doi.org/10.1097/ACM.0b013e31821da193).

Impetus: Medical students have been shown to experience decreased self-care behaviors when their workload increases. This study evaluates medical students' ability to modify their health behaviors via Behavioral Change Plans (BCPs) grounded in the principles and techniques of behavioral therapy.

Description: A one-group post-test design was used to evaluate the BCPs of 343 second year students at Northwestern University School of Medicine. Students in the classes of 2010 and 2011 participated in a six-week, 12-hour Healthy Living course, during which they completed the BCP activity. The activity targeted exercise, nutrition, sleep, personal habits/hygiene, study/ work habits, or mental/emotional health. 87.2% of students elected to modify exercise, nutrition, or sleep behavior. After self-monitoring behavior for six weeks, 40.5% of students indicated that they achieved their goal, 49.6% of students failed to achieve their goal, and 9.9% of students were uncertain about whether they met their goal. Overall, 79.9% of students felt that they were healthier after implementing the BCP, and 81.9% of students noted that they would use a BCP to monitor and set goals for individual behavior change in the future.

Contribution: This study suggests that a BCP can be a useful tool that allows medical students to reflect on their behaviors, devise a plan to modify their behavior, and self-monitor their progress towards an individual goal. The quantitative and qualitative data collected during the study revealed individual barriers and facilitators that influence student's behavior modifications. Only two student cohorts were studied at a single institution. The authors acknowledge that the lack of pre-test data is a limitation to the study design, and future studies should include both pre-test data and follow-up studies.

Cost: Unknown.

Physician Health-Care Utilization

Carvour ML, Ayyar BK, Chien KS, *et al.* A patient-centered approach to postgraduate trainee health and wellness: an applied review and health care delivery model. *Acad Med* 2016;91(9):1205-10. doi: [10.1097/ACM.0000000000001301](https://doi.org/10.1097/ACM.0000000000001301).

Impetus: Authors reviewed the literature analyzing the health care needs of postgraduate trainees, and provide data to show care afforded to this population often falls short of current standards. After identifying this gap, they explored a possible solution: the patient-centered medical home.

Description: This study evaluated the patient-centered medical home model as a potentially effective way to address the unmet or partially met health care needs of trainees. Several practical interventions to improve access to care are described, including care coordination and referral support, confidential care without perceived conflicts of interest in the training environment, co-location of medical and mental health care and accommodations for schedule constraints. The authors also explored the role of the medical home in developing and supporting broader institutional efforts to promote resident wellness.

Contribution: This paper alerts programs to the unmet or partially met health care needs of many residents, and suggests a solution: the medical home. Several practical interventions to increase residents' access to

care and use of services are described. Authors concluded that a critical step toward improving health and wellness in residents is to apply the relevant, evidence-based, and patient-centered principles of the primary care field to the wellbeing of those who train within it.

Cost: Appointment of a care coordinator (ideally someone separated from any supervisory or promotional role involving trainees) was the main cost identified by authors. The coordinator position could be 0.2-0.5 full time equivalents (FTE), depending on program size and anticipated resident needs. Medical and mental health care providers could be hired specifically for trainee healthcare. Alternately, some FTE share could be added to existing providers (e.g. within an employee health clinic, medical student clinic, primary care clinic, or another medical home).

Sleep/Fatigue Management

Shea JA, Bellini LM, Dinges DF, et al. Impact of protected sleep period for internal medicine interns on overnight call on depression, burnout, and empathy. *J Grad Med Educ* 2014;6(2):256-53.

doi: [10.4300/JGME-D-13-00241.1](https://doi.org/10.4300/JGME-D-13-00241.1).

Impetus: This publication assessed burnout, depression and empathy after a randomized controlled intervention: protected sleep periods for Internal Medicine interns during overnight in-house call. This study was part of a larger protocol conducted in the 2009-10 academic year on the internal medicine service at Philadelphia Veterans Affairs Medical Center (PVAMC) and on the oncology service at the Hospital of the University of Pennsylvania (HUP).

Description: A total of 106 internal medicine interns on overnight call were randomized to usual practice or a protected sleep period between 12:30AM and 5:30AM over a four-week rotation. Interns in the intervention group slept more during on-call days (3.23 vs. 2.54 hours at the PVAMC, $P = 0.004$; 3.36 vs. 2.42 hours at HUP, $P < .001$). The impact of the protected sleep period on burnout, depression and empathy scores was assessed using the Beck Depression Inventory (BDI-II), Interpersonal Reactivity Index (IRI) and Maslach Burnout Inventory (MBI). Pre-post rotation surveys were administered. Results showed that despite the expected increases in sleep, a protected sleep period produced no statistically significant improvements in depression, burnout or empathy. One possible explanation is that the absolute difference in the time slept is not clinically significant enough to impact sleep debt or the affective complications of sleep deprivation, such as burnout, empathy and depression. Additionally, the indicator subscales may have not been sensitive enough to detect small changes in outcomes that might occur with such small increases in sleep.

Contribution: This randomized controlled trial showed that attempting to protect a 5-hour period of time during overnight call for interns did result in a small but statistically significant increase in sleep time on call, but did not impact measures such as burnout, depression or empathy.

Cost: Senior night float residents carried the interns' pagers during the protected sleep period.

Shea JA, Dinges DF, Small DS, et al. A randomized trial of three-hour protected nap period in a medicine training program: sleep, alertness and patient outcomes. *Acad Med* 2014;89(3):452-9.

doi: [10.1097/ACM.0000000000000144](https://doi.org/10.1097/ACM.0000000000000144).

Impetus: Protected nap periods have been shown to increase sleep duration for medical interns, however, they also require additional personnel staffing. This study explored an alternative approach to the

optimization of fatigue management in interns who work extended duty periods of up to 30 hours with the goals of minimizing negative patient outcomes and the cost for additional personnel.

Description: This article used two randomized control trials at the Hospital of the University of Pennsylvania (HUP) and the Philadelphia Veterans Administration Medical Center (PVAMC) to evaluate the impact of three hour protected sleep periods on patient outcomes and medical interns' cognitive alertness and sleep duration. The three-minute Psychomotor Vigilance Test and Karolinska Sleepiness Scale were used to assess behavioral alertness. Sleep time was measured by the Actiwatch Spectrum wrist activity monitor, and interns reported sleep duration in diaries each morning. Participants were randomly assigned to the standard schedule or an intervention schedule, which included an alternating 3-hour protected nap period assigned either early or late in the course of the call night. Interns assigned to either protected period at HUP got significantly more sleep; while at PVAMC, only those assigned to the late-shift group slept more. All intervention groups (both early- and late-shifts at both hospitals) were significantly less likely to have call nights without sleep and had fewer attentional lapses on the Psychomotor Vigilance Test. Overall, patients did not experience worsened outcomes (length of stay, discharge to the medical intensive care unit, death, and 30-day readmission).

Contribution: This article summarizes the impact of protected sleep on medical intern's performance and offers a cost and personnel neutral approach to increase intern's sleep during prolonged shifts. These findings are consistent with previous studies on implementation of protected sleep periods for fatigue management.

Cost: Authors report no additional personnel to implement study design.

Avidan AY. Sleep and fatigue countermeasures for the neurology resident and physician. *Continuum (Minneapolis)* 2013;19(1 Sleep Disorders):204–22. doi: [10.1212/01.CON.0000427205.67811.08](https://doi.org/10.1212/01.CON.0000427205.67811.08).

Impetus: Reduced alertness in neurology residents has been shown to significantly impact cognitive and psychological function leading to errors and accidents. Implementation of limited hours of work alone has not been sufficient to help address these problems.

Description: This review article defines the problem in historical context and uses the Epworth Sleepiness Scale (ESS) to compare sleep deprived neurology residents with other conditions including narcolepsy and sleep apnea. The consequences of sleep deprivation on physical, cognitive, neurobehavioral, and patient care outcomes are described. A list of potential countermeasures used to combat this problem are reviewed.

Contribution: This articles reviews the pathobiology of sleep and fatigue in neurology residents, discussed the negative consequences of sleep deprivation and offers practical solutions that can be used to alleviate this problem through focused interventions to improve alertness, increase sleep duration, safety measures, circadian alignment and maximizing educational opportunities.

Cost: Unknown.

Wright KP, Bogan RK, Wyatt JK. Shift work and the assessment and management of shift work disorder (SWD). *Sleep Med Rev* 2012;17(1):41-54. doi: [10.1016/j.smrv.2012.02.002](https://doi.org/10.1016/j.smrv.2012.02.002).

Impetus: Shift work disorder and its consequences and management are described.

Description: This is an in-depth review with 128 references which describes the assessment and management of sleepiness and sleep disruption associated with shift work schedules and shift work disorder (SWD). Management strategies for shift work disorder are discussed in the review and include approaches to promote sleep, wakefulness and adaptation of the circadian clock to the imposed work schedule. While shift work disorder has not been studied in medical residents or doctors, there is an extensive body of literature on the prevalence of SWD and the associated health and behavioral problems in nurses.

Contribution: The existing body of literature on shift work disorder is summarized, and may prove relevant to medical residents and staff physicians.

Cost: Unknown.

Reed DA, Fletcher KE, Arora VM. Systematic review: association of shift length, protected sleep time, and night float with patient care, residents' health and education. *Ann of Intern Med* 2010;153(12):829-842.

doi: [10.7326/0003-4819-153-12-201012210-00010](https://doi.org/10.7326/0003-4819-153-12-201012210-00010).

Impetus: This systematic review of literature published from 1989 through 2010 summarizes the impact of shift length, protected sleep time and night float on patient care, resident health and educational outcomes among residents.

Description: Sixty-four studies were included. Most studies used single-institution, observational designs and many were felt to be methodologically weak, with a high risk for bias. However, 73% of the studies that examined shift length showed that shorter shifts were associated with decreased medical errors, motor vehicle crashes, and percutaneous injuries. While heterogeneous, this body of evidence appears to support reducing shift length; however, optimal shift duration was not adequately addressed. Other recommendations about protected sleep time and night float were limited by the quality of the methodology used in the original studies and unclear generalizability for most outcomes.

Contribution: Because of limitations in study quality, the outcomes of broad-based changes in residency training, including decreased shift length, protected sleep time and night float systems, are uncertain and warrant further investigation.

Cost: Unknown.

Rosen IM, Gimotty PA, Shea JA, Bellini LM. Evolution of sleep quantity, sleep deprivation, mood disturbances, empathy and burnout among interns. *Acad Med* 2006;81(1):82-5. [PMID: 16377826](https://pubmed.ncbi.nlm.nih.gov/16377826/).

Impetus: This paper addresses the relationship between sleep deprivation and the evolution of mood disturbances, empathy and burnout among a cohort of internal medicine interns prior to the 2003 ACGME duty hour reforms.

Description: This study evaluated a cohort of internal medicine interns (n=47) at a large academic medical center. Baseline and year-end outcome measures were: sleep quantity, subjective sleepiness (Epworth Sleepiness Scale), depression (Beck Depression Inventory–Short Form), empathy (Interpersonal Reactivity Index) and burnout (Maslach Burnout Inventory). Results confirmed previous findings showing that the prevalence of chronic sleep deprivation, depression, burnout and empathy increased from baseline to year end. There was non-significant association between sleep deprivation and depression.

Contribution: This study was one of the earliest to describe a potential relationship between sleep deprivation, burnout and loss of empathy. These findings informed future evaluation of the ACGME duty hour reform.

Cost: Unknown.

Nutrition

Hamidi MS, Boggild MK, Cheung AM. Running on empty: a review of nutrition and physicians' wellbeing. *Postgrad Med J* 2016;92:478-481. <http://dx.doi.org/10.1136/postgradmedj-2016-134131>.

Impetus: Poor nutrition can negatively impact a physician's performance, cognitive functioning and the quality of care provided. This review examines literature on physician nutrition and hydration and suggests potential multifactorial interventions to improve these measures.

Description: This review illustrates the influence that a balanced diet, meal timing, hydration, caffeine, nutrient deficiencies, and work hours have on physician fatigue, cognitive performance, and wellbeing.

Contribution: The findings highlight the need to incorporate physician wellbeing and nutrition in the workplace, and it indicates barriers that prevent physicians and physicians-in-training from receiving adequate nutrition including time, lack of healthy food options, and limited access to meals during night shifts. The authors suggest individual (taking nutrition and hydration breaks), professional (promoting a culture of physician self-care and nutrition), and organizational (implementing break schedules, increasing access to healthy food, and extending hours for food services near clinics operating overnight) interventions for physician wellbeing.

Cost: Unknown.

Lemaire JB, Wallace JE, Dinsmore K, et al. Physician nutrition and cognition during work hours: effect of a nutrition-based intervention. *BMC Health Serv Res* 2010;10:241. doi: [10.1186/1472-6963-10-241](https://doi.org/10.1186/1472-6963-10-241).

Impetus: Hectic scheduling often prevents physicians from receiving adequate hydration and nutrition. This study investigated the impact of a scheduled nutrition intervention on physician's cognitive functioning, glucose, and hypoglycemic symptoms.

Description: A pre/post-test design was used to examine the impact of scheduled nutrition breaks on 20 physicians from surgical, medical, and primary care specialties in a large, urban hospital. Participants selected two similar work days to undergo baseline and intervention testing. For baseline testing, physicians followed their typical hydration and nutrition habits. For intervention testing, physicians were provided nutritious food and drink by the research staff at scheduled intervals. The impact of the intervention was evaluated using simple and complex reaction tests, blood glucose levels, activity level, body mass, heart rate and reported hypoglycemic symptoms. On intervention day, physicians reported significantly increased caloric intake, better hydration status, lower mean glucose levels, less variable mean glucose levels, improved cognitive functioning, and fewer hypoglycemic symptoms (although this was not statistically significant). Participants felt that the wellness initiative they participated in increased their awareness of the importance and impact of workplace nutrition, and helped encourage intent to change nutrition habits.

Contribution: These findings show that physicians do not properly consume food and water at work, and that a physician-centered, workplace-based nutrition intervention can impact physician cognitive functioning, hypoglycemic symptoms and glucose levels. Future studies could evaluate alternate delivery methods to impact of increased physician access to food and drink.

Cost: Unknown, but resources for personalized delivery and healthy options would be necessary.

Lemaire JB, Wallace JE, Dinsmore K, Roberts D. Food for thought: an exploratory study of how physicians experience poor workplace nutrition. *Nutr J* 2011;10(1):18. doi: [10.1186/1475-2891-10-18](https://doi.org/10.1186/1475-2891-10-18).

Impetus: Physicians often do not pay attention to nutrition during the workday. This study explored physician views on their nutrition in the workplace, including impact on personal wellness and professional performance.

Description: This qualitative study involved 20 physicians (10 from medical specialties, eight from surgical specialties, and two from primary care) from an urban teaching hospital who had agreed to participate in a nutrition-based wellness study participated in semi-structured interviews before and after the intervention. The two lead co-investigators independently reviewed the transcripts using an inductive strategy to derive predominant themes. Study participants identified several ways inadequate nutrition could negatively impact their emotional and physical health, cognitive and professional abilities and interpersonal interactions with colleagues, care providers, and patients. Barriers to good nutrition were identified, and included lack of time, stringent work ethic, poor access, limited choice, and cost.

Contribution: The study was helpful in elucidating some of the issues and impacts of inadequate nutrition for physicians in the workplace. The study findings could be used to design a larger study to better define and quantify the issues delineated around impact and barriers of workplace nutrition.

Cost: Unknown.

Exercise

Thordike AN, Mills S, Sonnenberg L, et al. Activity monitor intervention to promote physical activity of physicians-in-training: randomized controlled trial. *PLoS One* 2014;9(6):e100251. doi: [10.1371/journal.pone.0100251](https://doi.org/10.1371/journal.pone.0100251).

Impetus: Research suggests that resident physicians exercise less than medical students and attendings. As residents spend most of their waking at work, this study evaluated the effect of using an activity tracker on resident's physical health and patient health counseling.

Description: The study was carried out over two 6-week phases with 104 residents at a large academic medical center in Boston. During the study, residents were granted free access to: an on-site fitness center; a weekly, one-hour personal training session; and two sessions with a nutritionist. Phase 1 was a randomized controlled trial in which 52 residents received an activity tracker with visible step data and 52 received an activity tracker with blinded step data. Phase 2 was a non-randomized team step competition, and all participants had visible step data. The impact of the intervention was analyzed by daily steps, compliance with wearing the activity tracker, diastolic and systolic blood pressure, HDL and LDL cholesterol, BMI, fitness center use, and nutritionist use. There was no difference in steps per day between intervention and

control groups in Phase 1, but all participants increased their daily steps during the team-competition of Phase 2. However, participants did have significant improvements in systolic blood pressure, HDL cholesterol, and use of fitness center resources (membership, personal trainer and nutritionist).

Contribution: The study contributes to the literature as the first randomized trial to use activity trackers to promote physical health among resident physicians. Moreover, the study indicates that multimodal interventions (activity trackers, team-based competitions, free access to fitness resources) can impact resident physicians' health, even if they are unable to participate in physical activity outside of duty hours. Future studies should collect baseline step activity and consider the impact of free fitness center access.

Cost: Unknown, but activity trackers cost about \$100 each.

Weight CJ, Sellon JL, Lessard-Anderson CR, *et al.* Physical Activity, quality of life, and burnout among physician trainees: the effect of a team-based, incentivized exercise program. *Mayo Clinic Proc* 2013;88(12);1435-1442. doi: [10.1016/j.mayocp.2013.09.010](https://doi.org/10.1016/j.mayocp.2013.09.010).

Impetus: Research shows that regular physical activity affects physicians' quality of life, but the impact on burnout has not been well established. This study evaluated the effect of a voluntary, incentivized exercise program on resident and fellow physical activity, quality of life, and burnout.

Description: The voluntary, team-based, incentivized exercise program lasted 12-weeks, and all medical fellows and residents (n = 1060) at Mayo Clinic in Rochester, Minnesota were invited to participate in the exercise program, submit baseline data, and complete the exit survey. 628 residents and fellows completed the baseline survey, 532 completed the exit survey, and 230 enrolled in the program. Both participants and non-participants had access to the same institutional exercise facilities. The impact of the intervention was measured on self-reported gym attendance and aerobic activity; participation in baseline and exit surveys; participation in a wellness exam; body fat percentage; and leg press strength. Only 31% of all intervention participants and non-participants met the U.S. Department of Health and Human Services recommendations for physical activity. Residents and fellows who participated in the intervention showed significantly increased physical activity (with almost half meeting the daily recommendation) and had a significantly higher median quality of life. There was a small trend towards decreased burnout, but this finding was not statistically significant.

Contribution: This study supports the finding that physical activity is linked with higher quality of life in physicians. The study also shows that an incentivized exercise program can increase physical activity among medical residents and fellows.

Cost: Unknown.

Watson DT, Long WJ, Yen D, Pichora DR. Health promotion program: a resident wellbeing study. *Iowa Orthop J* 2009;29:83–7. [PMCID: PMC2723698](https://pubmed.ncbi.nlm.nih.gov/2723698/).

Impetus: Workplace health promotion programs have been shown to increase productivity. This study evaluated the impact of a workplace health promotion program on presenteeism among orthopedic and general surgery residents.

Description: In 2003, orthopedic and general surgery residents at a Tertiary Care Level 1 trauma center completed the Stanford Presenteeism Scale: Health Status and Employee Productivity Questionnaire (SPS-6) along with questions about exercise and absenteeism at baseline and end of the year. All residents were granted free, 24 hour, onsite access to a health promotion facility equipped with strength and cardiovascular equipment. Residents using the facility were asked to document their use of the equipment by signing into a logbook upon entering and exiting the room. Response rates were similar at baseline and end of the year: 78-79% of residents filled out the surveys. The data show a non-statistically significant improvement in residents mean presenteeism score post intervention. Furthermore, the data show a non-statistically trend toward improved SPS-6 scores among residents who document use of the facility in the logbook (2.7 ± 4.8) vs those who did not (0.4 ± 3.3).

Contribution: This study supports the finding that a workplace health promotion program has potential to improve presenteeism.

Cost: Unknown.

Rogers LQ, Gutin B, Humphries MC, et al. A physician fitness program: enhancing the physician as an “exercise” role model for patients. *Teach Learn Med* 2005;17(1):27-35. doi: [10.1207/s15328015t1m1701_6](https://doi.org/10.1207/s15328015t1m1701_6).

Impetus: Research shows that only 30% of physicians report regular physical activity. Physicians’ personal health behaviors have been shown to alter their ability to counsel patients on nutrition and physical fitness. This study examined the effectiveness of a fitness program on resident cardiovascular fitness, body mass index, physical activity, and patient exercise counseling.

Description: This study was a non-randomized intervention with outcomes measured at baseline, three months (at the end of the intervention), and six months (three months post intervention). Forty-two internal medicine resident physicians completed testing at baseline and first follow-up. Twenty-five participants completed all three phases of data collection. The effectiveness of the physician fitness program was measured by (1) participant attendance at intervention activities (e.g. faculty/resident softball games, fun runs/walks, exercise testing, group conferences, Race Across America Contest), (2) changes in peak VO₂, (3) self-reported physical activity, (4) body mass index (BMI), (5) knowledge and behavioral attitudes, and (6) patient counseling about physical fitness. At 3-month follow-up, results revealed a decrease in residents’ BMI and an increase in residents’ confidence in their ability to provide physical activity counseling. The results were not maintained at the 6-month follow-up.

Contribution: This study was the first to evaluate a fitness program in resident physicians. The study demonstrated that physician fitness programs can improve resident physicians’ physical activity and BMI during the intervention, but not at three months post-intervention. However, study attrition at the 3- and 6-month time points limited the scope of the results.

Cost: Unknown.

EMOTIONAL HEALTH INTERVENTIONS

Mindfulness Training

Medical Students

Dyrbye LN, Shanafelt TD, Werner L, et al. The impact of a required longitudinal stress management and resilience training course for first-year medical students. *J Gen Intern Med* 2017. [Epub ahead of print 31 Aug 2017]. doi: [10.1007/s11606-017-4171-2](https://doi.org/10.1007/s11606-017-4171-2).

Impetus: Prior studies using mindfulness-based stress reduction in trainees and practicing physicians have shown reductions in burnout. However, in prior studies, these interventions were voluntary. This study evaluates whether incorporation of a longitudinal curriculum based on mindfulness-based stress reduction (MBSR) as a required component of the first year medical school curriculum improved wellbeing.

Description: All first year students at Mayo Clinic School of Medicine in 2014 and 2015 participated in a MBSR course using the Stress Management and Resilience Training (SMART) program previously used in two randomized trials, which included a total of 12 curricular hours for the 2014 cohort and 10 hours for the 2015 cohort. The course was revised based on student feedback between 2014 and 2015. Content was delivered through small groups led by inter-disciplinary with content and small-group facilitation expertise, and included a check in, reflection activity, group discussion, and skills training. Students completed a pre- and post- survey with the Maslach Burnout Inventory, Medical Outcomes Study Short Form, Perceived Stress Scale, Connor-Davidson Resilience Scale, and Happiness and Gratitude Scale. Paired analysis was available for 43.1% of students. Compared to baseline at the start of the year, stress significantly increased and happiness and quality of life significantly declined. Empathy also declined, although the decline was only significant in the 2014 cohort. Burnout increased, although the increase was not statistically significant, and resilience did not change significantly. Students appreciated efforts to incorporate wellness into the curriculum but felt that it took time away from other efforts. Although direct comparison to prior classes was not possible, the changes in wellbeing were not improved compared to a pre-intervention cohort. Overall, this required curriculum did not improve resilience or clearly mitigate the impact of the rigors of medical school on wellbeing.

Contribution: This study's strength included its design using validated outcome measures of wellbeing and the use of a required, embedded curriculum for an entire cohort of medical students. Given the discrepancy between this finding and prior studies of volunteers, the authors suggest that the benefits that have been seen in opt-in interventions may not translate into improvements in wellbeing when participation is required. They highlight the need to offer a variety of options that students can select, in addition to programmatic interventions that improve the learning environment.

Cost: The authors note that funding and resources to support the curriculum were included in the student affairs budget but do not specify the amount.

Dobkin PL and Hutchinson TA. Teaching mindfulness in medical school: where are we now and where are we going? *Med Educ* 2013;47(8):768–79. doi: [10.1111/medu.12200](https://doi.org/10.1111/medu.12200).

Impetus: Prior to this publication, past studies have shown that teaching mindfulness in medical school reduces distress, and has the potential to decrease burnout and increase quality of life. The purpose of this

review was to describe which schools teach mindfulness, and to determine the extent to which these programs are carried out with medical students.

Description: This article summarizes 14 medical school programs that teach mindfulness to medical and dental students and residents. Programs were identified and program or course directors were contacted for more information. A wide range of formats were used to teach mindfulness including simple lectures, day-long workshops, and 8-10-week programs in mindfulness-based stress reduction. Two medical schools had integrated mindfulness into their curriculum: the University of Rochester School of Medicine and Dentistry (USA) and the Monash Medical School (Australia).

Contribution: This publication describes the multiple different ways mindfulness was being taught in medical schools and provides ideas for integrating mindfulness-based stress reduction programs and training into medical education. The article also provides links to various programs as well as faculty contact information. The variability of the delivery of mindfulness interventions highlights the heterogeneity of this body of literature; the authors suggest more rigorous studies are needed to further evaluate how this intervention can best be incorporated into medical school curricula.

Cost: Unknown.

Warnecke E, Quinn S, Ogden K, et al. A randomized controlled trial of the effects of mindfulness practice on medical student stress levels. *Med Educ* 2011;45(4):381-8. doi: [10.1111/j.1365-2923.2010.03877.x](https://doi.org/10.1111/j.1365-2923.2010.03877.x).

Impetus: Mindfulness interventions have been shown to reduce stress in medical students and physicians. However, these interventions are often time consuming and require determination and commitment. This study aimed to examine whether an audio CD of guided mindfulness practice could be used to decrease stress, anxiety and depression in senior medical students.

Description: This study was a multicenter, randomized controlled trial with intention-to-treat analysis in three medical schools attached to the University of Tasmania in Hobart, Tasmania. Sixty-six students were randomized to either usual care or the intervention group. The intervention group received an audio CD of guided mindfulness practice and were instructed to use the CD daily over eight weeks. The impact of the intervention was measured by the Perceived Stress Scale (PSS) and Depression, Anxiety and Stress Scale (DASS). The intervention group had a significant decrease in perceived stress (on the PSS) and anxiety (on the DASS). A borderline significant effect was observed on the stress component of the DASS ($p = 0.05$). The significant effects were maintained at eight weeks follow up.

Contribution: This study contributed significantly to literature on mindfulness and stress among medical students. First, the study confirmed that medical students experience higher rates of stress than their age-matched peers. Second, it is the first randomized controlled trial to examine an audio CD mindfulness intervention for stress management. This intervention requires less time and fewer resources than traditional mindfulness-based stress reduction, and is self-guided by students, making it more accessible for their schedules. The randomized structure also strengthens this study.

Cost: Funding was provided by a seed grant awarded by the Australian and New Zealand Association for Health Professional Educators (ANZAHPE); detailed cost data not provided.

Rosenzweig S, Reibel DK, Greeson JM, *et al.* Mindfulness-based stress reduction lowers psychological distress in medical students. *Teach Learn Med* 2003;15(2):88-92. doi: [10.1207/S15328015TLM1502_03](https://doi.org/10.1207/S15328015TLM1502_03).

Impetus: Research has demonstrated that mindfulness-based stress reduction (MBSR) as an educational intervention improves coping skills and reduces emotional distress in medical students. This study aimed to examine the effectiveness of MBSR as an intervention in a prospective, non-randomized study.

Description: This study was conducted at Jefferson Medical College from 1996-2000. Second-year medical students could self-select to participate in a MBSR program offered as one choice among several electives; approximately 18% of each class chose the MBSR elective. MBSR students (n=140) were taught a variety of mindfulness meditation practices (including body scan, breath awareness, mindful stretching, eating meditation, walking meditation, and guided imagery), and were expected to practice 20 min of formal meditation six days/week. The control group students (n=162) participated in a didactic course on complementary and alternative medicine. All students were administered the Profile of Mood States (POMS) instrument pre- and post-course. MBSR students experienced an 18% decrease (pre-course to post-course) in Total Mood Disturbance (TMD), whereas control students experienced a 38% increase. Improvements in several POMS subscale scores were also seen in MBSR students, whereas declines were seen in several subscale scores in the control students. Of the MBSR students surveyed, 98% said they would recommend the course to other medical students.

Contribution: This study contributes to literature on mindfulness-based stress reduction for medical students. Results from this study reveal that MBSR is an effective stress management intervention for medical students.

Cost: Unknown.

Interns/ Residents /Fellows

Taylor M, Hageman JR, Brown M. A mindfulness intervention for residents: relevance for pediatricians. *Pediatric Ann.* 2016;45(10):e373–e376. doi: [10.3928/19382359-20160912-01](https://doi.org/10.3928/19382359-20160912-01).

Impetus: Given the growing prevalence and impact of physician burnout in the modern health care system, targeted interventions designed to reduce burnout and promote wellbeing are necessary in medical training and practice. Mindfulness interventions have demonstrated efficacy, but many of the successful programs documented in research demand a significant time commitment that presents a limiting factor for busy providers. This study aimed to evaluate the feasibility and potential impact of a brief intervention in mindfulness meditation via a smartphone application for a pediatric resident population.

Description: This uncontrolled study consisted of 33 volunteer participants recruited from the University of Chicago pediatric residency program. The intervention consisted of ten 10-minute recorded sessions delivered over a 10-day period via the free smartphone application Headspace. Each session was comprised of educational material and a short guided meditation. Quantitative measures included pre- and post-intervention abbreviated Maslach Burnout Inventory (aMBI) and the Mindful Attention Awareness Scale. Outcome measures indicated no statistically significant change in pre- to post-intervention aMBI measures of personal accomplishment, depersonalization, emotional exhaustion, or job satisfaction; however, this negative result was limited by the small number of participating residents (n=33), 11 of whom completed the post-intervention survey. The majority of participants (84%) cited lack of time as a perceived barrier to regular mindfulness meditation practice. After the intervention, more residents perceived mindfulness as useful and planned to discuss potential therapeutic benefits with their patients. Limitations include small

sample size, potential selection bias, and self-reported data that was not objectively confirmed by researchers.

Contribution: This research supports the well-documented evidence that burnout is a significant problem facing physicians and trainees. The brief intervention in mindfulness meditation offered convenience in its delivery via a smartphone application, but residents clearly identified time limitations as the most significant barrier to incorporating meditation into their daily practice. Future research should evaluate the potential impact of integrating mindfulness training into formal educational curriculum to alleviate the burden of residents' time limitation.

Cost: Unknown.

Goldhagen BE, Kingsolver K, Stinnett SS, Rosdahl JA. Stress and burnout in residents: impact of mindfulness-based resilience training. *Adv Med Educ Prac* 2015;6:525-32. doi: [10.2147/AMEP.S88580](https://doi.org/10.2147/AMEP.S88580).

Impetus: Several mindfulness-based interventions have been shown to be effective for reducing burnout in primary care physicians and medical students. However, these time-intensive programs have limited practicality for busy residents. This study attempted to develop a shortened mindfulness-based intervention for residents with hopes of reducing burnout, depression and anxiety, and increasing mindfulness.

Description: Residents from several different residencies at Duke University (Family Medicine, Psychiatry, and Anesthesia) participated in two or three 1-hour sessions that introduced mindful awareness and included practical exercises that nurtured resilience. The intervention fit into resident schedules, and impact was measured by validated scales evaluating burnout (Oldenburg Burnout Inventory, OLBI); depression, anxiety and stress (DASS-21); and mindfulness (MAAS). Data was limited: 47 residents completed the pre-intervention survey, 30 completed the immediate post-intervention survey, and only 7/30 completed the 1-month follow-up survey. There were no significant changes in burnout or mindfulness. However, for female and PGY1-2 residents, there was a trend towards decrease in the DASS-21 score. In addition, those that reported higher baseline stress had a trend towards a reduction in stress and burnout.

Contribution: This study demonstrated that a shortened mindfulness-based program was not effective in reducing burnout among medicine residents; however, results are likely to be skewed by fairly small sample sizes. While the intervention did not demonstrate the expected effect, the paper did comment on ways that the program could change in order to become more effective. While studies that demonstrate change are often the only studies that are published, knowing which interventions that are not effective is equally important. In agreement with prior research, these results also show that at baseline, female residents experience significantly higher depression, anxiety and stress (as measured by DASS-21 scores), as well as emotional exhaustion (as measured by OLBI scores).

Cost: Unknown.

Rosdahl JA and Kingsolver KO. Mindfulness training to increase resilience and decrease stress and burnout in ophthalmology residents: a pilot study. *Invest Ophthalmol Vis Sci* 2014;55(13):5579. Abstract

Impetus: Stress and burnout are prevalent problems in ophthalmology residents. Practical ways to improve both of these measures are needed at the residency level. This abstract publication evaluates whether a 3-hour mindfulness training can impact depression, anxiety, stress and burnout.

Description: The intervention was a 3-hour session that introduced mindful awareness and included practical exercises that nurtured resilience. Standard web-based validated instruments of depression/anxiety/stress (DASS-21) and burnout (Oldenburg Burnout Inventory; OLBI) were administered prior to, and four to six weeks after, the intervention was delivered. Twelve of 18 ophthalmology residents completed the initial baseline assessment; eight of these residents participated in the intervention, but only 5/8 completed the post-intervention survey. Despite the small number, 80% of the intervention participants showed improvement in both outcome measures.

Contribution: The results of this small pilot study show promise for an abbreviated 3-hour mindfulness-based intervention for decreasing stress and burnout in residents.

Cost: Unknown.

Practicing Physicians

Dobkin PL, Bernardi NF, Bagnis CI. Enhancing clinicians' wellbeing and patient-centered care through mindfulness. *J Contin Educ Health Prof* 2016;36(1):11-6. doi: [10.1097/CEH.0000000000000021](https://doi.org/10.1097/CEH.0000000000000021).

Impetus: This study evaluated the impact of a mindfulness-based stress reduction (MBSR) course on provider wellness, burnout, and mindfulness. The authors also sought to evaluate whether this program improved physician communication with patients.

Description: This longitudinal study was conducted at the Pitié-Salpêtrière Hospital in Paris from September to December 2014. The full 8-week MBSR course was the intervention provided. The authors used pre- and post-intervention validated questionnaires to measure burnout (Maslach Burnout Inventory, MBI), depression (Beck Depression Inventory II, BDI), stress (Perceived Stress Scale, PSS), meaningfulness (Sense of Coherence), and mindfulness (Five Facet Mindfulness Questionnaire, FFMQ) in physicians. The authors also asked patients to evaluate their physicians' communication pre- and post-intervention, using the Rochester Communication Rating Scale. Lastly, several patient encounters were audio-recorded, transcribed, and analyzed using a Roter Interaction Analysis System (RIAS) to provide qualitative analysis of patient-physician encounters. This study included providers from multiple disciplines: physicians, psychologists, nurses, dieticians, an osteopath, and a research coordinator participated. Two people dropped out, leaving 25 participants in the data analysis. The communication evaluation included 18 participants, due to poor patient follow-up. The physicians who participated were from different specialties: cardiology, addiction medicine, internal medicine, oncology, pediatric psychiatry, and family medicine. The authors found significant reductions in burnout, as well as increases in mindfulness and meaningfulness among clinicians after the MBSR. They also found that patients' perceptions of clinical encounters improved, suggesting that patient-centered care improved after MBSR.

Contribution: This paper not only demonstrated the effectiveness of MBSR in improving provider-centered outcomes, but also tied these changes to improvements in patient care. Despite its small size, it was a well-done study that provides helpful information.

Cost: Unknown.

Podgurski L, Claxton R, Greco CM, et al. Brief mindfulness-based self-care curriculum for an interprofessional group of palliative care providers (FR469-B). *J Pain Sym Man* 2015;49(2):384–385.

Abstract <http://dx.doi.org/10.1016/j.jpainsymman.2014.11.138>.

Impetus: Mindfulness-based initiatives have demonstrated self-care benefits among hospice and palliative care clinicians. Many established programs require a significant time investment (18-52 hours of instruction), limiting their utility among primary care clinicians. This research focused on the potential efficacy of a brief mindfulness-based intervention among a group of inter-professional palliative care providers.

Description: The mindfulness self-care curriculum consisted of five monthly 1-hour sessions. The efficacy of the intervention was evaluated based on pre- and post-intervention surveys that assessed mindfulness, burnout, and stress using validated scales, as well as satisfaction and narrative data. Given the abstract format, data was not included. Reported results indicate that participants were highly satisfied with this intervention and showed significant improvements in both mindfulness (on three of five subscales) and burnout levels (on one of three subscales). Narrative evaluation demonstrated retention of curricular concepts, and participants expressed interest in continuing elements of the program in ongoing activities.

Contribution: This research suggests that that time-intensive mindfulness curricula can be successfully adapted to a more brief initiative delivered within the regular workday, making it much more feasible for busy clinicians to participate and potentially benefit from a mindfulness-based program. Larger studies are needed.

Cost: Unknown.

Amutio A, Martinez-Taboada C, Delgado LC, et al. Acceptability and effectiveness of a long-term educational intervention to reduce physicians' stress-related conditions. *J Contin Educ Health Prof* 2015;35(4):255-60. doi: [10.1097/CEH.0000000000000002](https://doi.org/10.1097/CEH.0000000000000002).

Impetus: Learning mindfulness has been shown to successfully reduce stress-related symptoms, including burnout, in health professionals. Most studies have focused on the short-term impact of interventions, and have studied only emotional symptom improvements. This study evaluated the effectiveness of a two-phase mindfulness intervention (8-week initial treatment plus 10-month maintenance phase) in reducing work stress-related emotional and physical symptoms (burnout, heart rate and blood pressure) in physicians.

Description: This was a randomized-control study of 42 physicians in Spain who were randomized to the intervention (n=21) or to a waitlist control (n=21). Surveys (Maslach Burnout Inventory, MBI; Five Facet Mindfulness Questionnaire) were administered pre-intervention, immediately following Phase 1 and Phase 2. Blood pressure and heart rate were checked before and after each session for the intervention group throughout the 10-month period. After the completion of the eight weeks of treatment, the intervention

group showed significant increases in mindfulness, decreases in the emotional exhaustion component of the burnout measure, and improvements in heart rate and blood pressure. The effects on depersonalization and personal accomplishment were non-significant. Over the 10-month maintenance period, the improvements were maintained in the intervention group especially for mindfulness and systolic blood pressure. Acceptance was high, as indicated by low attrition rate and high compliance with program activities.

Contribution: This study substantiates prior evidence that mindfulness-like interventions can decrease emotional exhaustion and increase mindfulness in physicians. The findings add to evidence that this type of intervention can also positively impact heart rate and blood pressure. Additionally, this study showed sustained positive effects during a maintenance phase that extended the intervention to 12 months total.

Cost: Unknown.

Asuero AM, Queralto JM, Pujol-Ribera E, et al. Effectiveness of a mindfulness education program in primary health care professionals: a pragmatic controlled trial. *J Contin Educ Health Prof* 2014;34(1);4-12. doi: [10.1002/chp.21211](https://doi.org/10.1002/chp.21211).

Impetus: This study was designed to assess the effectiveness of a Mindfulness-Based Stress Reduction (MBSR) program in reducing burnout and mood disturbance and improving empathy and mindfulness among primary health care professionals in Spain.

Description: This randomized controlled trial used validated surveys to measure pre- and post-intervention burnout (Maslach Burnout Inventory, MBI), mindfulness (Baer's Five Facet Mindfulness Questionnaire), empathy (Jefferson Scale of Physician Empathy), and mood disturbance (Profile of Mood States). Sixty-eight primary health care professionals (physicians, nurses, social workers and clinical psychologists) were randomized into intervention (n=43) and control (n=25). The intervention was the standard 8-week mindfulness-based stress reduction (MBSR) course. Results showed that intervention participants improved in all four scales. The magnitude of change was large in total mood disturbance and mindfulness and moderate in burnout and empathy scales. No significant differences were found in the control group.

Contribution: This randomized controlled trial was able to show the effectiveness of a mindfulness-based stress reduction program for primary health care professionals in Spain. The authors demonstrated a decrease in burnout and mood disturbance over the course of the 8-week program, as well as an increase in compassion and mindfulness.

Cost: Unknown.

Moody K, Kramer D, Santizo RO, et al. Helping the helpers: mindfulness training for burnout in pediatric oncology--a pilot program. *J Pediatr Oncol Nurs* 2013;30(5):275–84. doi: [10.1177/1043454213504497](https://doi.org/10.1177/1043454213504497).

Impetus: The prevalence of burnout among pediatric oncology staff is documented between 40% and 60%. Despite the urgent need for modifying interventions, there is little research on successful interventions to prevent or reduce burnout symptoms among pediatric oncology providers. Additionally, the time-intensive mindfulness-based stress reduction (MBSR) intervention has limited its utilization. This study was planned as a feasibility pilot study to evaluate the impact of an abbreviated mindfulness-based course (MBC) on

burnout, stress, and depression among pediatric oncology clinical staff (including nurses, social workers, physicians, nurse practitioners, psychologists, and child-life specialists), who were recruited from two academic programs: The Children's Hospital in Montefiore in NYC and the Schneider Children's Hospital in Petach Tikva, Israel.

Description: This randomized controlled study measured the impact of an abbreviated mindfulness-based course (MBC) based on Kabat-Zinn's concept of mindfulness. The intervention was a structured skills-training program with weekly meetings consisting of an introductory 6-hour session, six weekly 1-hour follow-up sessions, and a final 3-hour wrap-up session, for a total of 15 contact hours, significantly fewer hours than other courses that entail an investment of 30 to 60 hours. A total of 48 people enrolled, 23 of whom were in the intervention arm (12 in U.S., 11 in Israel). Sessions were delivered in a group setting at each hospital. Participants received formal instruction in a variety of mindfulness practices, including body scan, sitting meditation, mindful movement, the STOP mini-meditation technique and loving-kindness meditation. They were provided with CD recordings to guide home practice and asked to practice these techniques and journal their experience daily between course sessions. Qualitative review of journals from the intervention arm suggested that participants were experiencing expected benefits of mindfulness training. However, quantitative outcome measures based on pre-post course completion of the Maslach Burnout Inventory (MBI), the Perceived Stress Scale-14 (PSS), and the Beck Depression Inventory (BDI) showed no significant differences between the control and intervention groups at baseline and follow-up. The authors suggest that the severity of the stress and burnout within the pediatric oncology specialty may in part explain the lack of improvement in objective measures. At baseline, the sample in this study was significantly more stressed and burned out compared to samples from other similarly-designed studies that have shown benefit with other groups of healthcare professionals. The authors suggest that future interventions for this population may need to be more robust or may benefit from additional stress reduction or relaxation techniques. Research limitations include relatively small sample size and lack of blinding.

Contribution: This research suggests that mindfulness-based training does offer some apparent subjective benefits for pediatric oncology clinical staff, but has not demonstrated significant objective improvements in measures of stress, burnout, and depression. The abbreviated nature of the intervention may also have limited its effectiveness.

Cost: Unknown.

Fortney L, Luchterhand C, Zakletskaia L, et al. Abbreviated mindfulness intervention for job satisfaction, quality of life, and compassion in primary care clinicians: A pilot study. *Ann Fam Med* 2013;11(5):412–20. doi: [10.1370/afm.1511](https://doi.org/10.1370/afm.1511).

Impetus: Burnout, attrition and poor work satisfaction are pervasive issues among primary care physicians that can negatively influence patient care. However, interventions for improving work-life balance are limited in scope and evaluation. This study aimed to understand the potential impact of an abbreviated mindfulness course for 30 primary care physicians at University of Wisconsin-Madison.

Description: This uncontrolled study measured the impact of an abbreviated version of the established Mindfulness-Based Stress Reduction (MBSR) program on primary care physicians by comparing self-reported pre-post survey results. The abbreviated program was completed in approximately half the time required for the typical MBSR program. Thirty physicians (family medicine, internal medicine, and

pediatrics) were recruited. Data was collected at four different time points (baseline and one day, eight weeks and nine months post-intervention) and 5 validated measures were used: Maslach Burnout Inventory (MBI); the Depression Anxiety Stress Scales-21 (DASS-21); the Perceived Stress Scale (PSS); the 14-item Resilience Scale (RS-14); and the Santa Clara Brief Compassion Scale (SCBC). Retention in the intervention was high (29/30); 28 (93%) of the participants gave responses for survey 2, and 23 (77%) gave responses for surveys 3 and 4. Results showed significant improvements in the MBI and DASS-21 measures at all 3 time points. However, there was no significant change in the RS-14 or SCBC scores. Impressively, at the 9-month post-intervention time-point, participants showed sustained significant improvements in emotional exhaustion, depersonalization, personal accomplishment, depression, anxiety, stress, and perceived stress.

Contribution: This research suggests that an abbreviated MBSR program may be a time- and resource-efficient tool to achieve significant improvements in clinician stress and burnout symptoms, and to positively influence physicians' work satisfaction. Additionally, this study evaluated physicians in three different primary care specialties and added a website portion, which allowed physicians to directly apply their mindfulness lessons to their clinical practice. Most impressively, improvements in burnout, stress and work satisfaction were sustained at nine months post-intervention, without any maintenance phase.

Cost: Unknown.

Goodman MJ and Schorling JB. A mindfulness course decreases burnout and improves wellbeing among healthcare providers. *Intern J Psychiatry Med* 2012;43(2):119–28. doi: [10.2190/PM.43.2.b](https://doi.org/10.2190/PM.43.2.b).

Impetus: This study aimed to understand the potential impact of a continuing education course in mindfulness for a broad range of multidisciplinary healthcare providers near Charlottesville, Virginia.

Description: This uncontrolled study measured the impact of an eight-week continuing education course modeled after the established Mindfulness-Based Stress Reduction (MBSR) program and offered formal instruction in a variety of mindfulness practices. The course was taught 11 times between 2004-2010, with a total of 93 participants (51 physicians, 42 non-physician providers) for a tuition cost of \$400 for all enrollees and a \$200 discount for residents/fellows. Common themes emerging throughout the years include perfectionism, self-criticism, guilt, feelings of not doing enough, feeling powerless to help, and frustration with patients who are unable or unwilling to make lifestyle changes. Quantitative outcome measures based on pre-post course completion of the Maslach Burnout Inventory (MBI) and the Short Form-12v2 showed significant improvements in emotional exhaustion, depersonalization, personal accomplishment, and mental health. The physical health SF-12v2 subscale, however, was not significantly changed.

Contribution: This study reports aggregate data over the course of six years with 93 participants, and shows that the traditional MBSR courses seems to be an effective tool for achieving significant improvements in burnout scores and mental wellbeing among a diverse range of healthcare providers. Offering the MBSR course for continuing education credits may aid in its implementation and in physician engagement, given the time-intensive intervention. Further research should include a control group.

Cost: Unknown, although tuition cost of \$400 for all enrollees, with a \$200 discount for residents/fellows

Beckman HB, Wendland M, Mooney C, *et al.* The impact of a program in mindful communication on primary care physicians. *Acad Med* 2012;87(6):815-19. doi: [10.1097/ACM.0b013e318253d3b2](https://doi.org/10.1097/ACM.0b013e318253d3b2).

Impetus: This qualitative study sought to understand the impact of a mindful communication program on patient-centered care and physician wellbeing. The intervention was given to primary care physicians in Rochester, NY.

Description: This paper reports the qualitative themes obtained on exit interviews of 20 primary care physicians after participation in a mindful communication program. The program consisted of eight weekly sessions, a silent retreat, and 10 monthly sessions, totaling 52 hours. The course focused on mindfulness meditation, self-awareness exercises, narratives of clinical experiences, didactic material, and discussion. The authors randomly selected 20 physicians from those who had completed at least four weekly and four monthly sessions. They then interviewed 15 physicians in person and five over the phone. Analysis of the interviews revealed three main themes: (1) sharing experiences of medical practice with colleagues reduced professional isolation, (2) mindfulness skills improved physicians' ability to perform patient-centered care, and (3) developing greater self-awareness was a positive step towards personal and professional growth.

Contribution: The study identified important themes in understanding the impact of a mindfulness program on primary care physicians. The authors indicated that future research should explore the impact of mindfulness interventions on patient outcomes and physicians' actual behaviors.

Cost: Unknown.

Irving JA, Dobkin PL, Park J. Cultivating mindfulness in health care professionals: a review of empirical studies of mindfulness-based stress reduction (MBSR). *Complement Ther Clin Pract* 2009;15(2):61–6. doi: [10.1016/j.ctcp.2009.01.002](https://doi.org/10.1016/j.ctcp.2009.01.002).

Impetus: Stress and burnout symptoms are endemic among health care professionals and have been shown to have a negative influence on providers, patients and the health care system. This review was designed to evaluate the effectiveness of mindfulness-based stress reduction (MBSR) programs aimed at promoting clinicians' wellbeing and self-care skills.

Description: Mindfulness-based stress reduction is an 8-week psycho-educational program that consists of seven weekly 2.5 hour-long classes including instruction in various meditation practices (e.g. body scan, sitting and walking meditation, hatha yoga) as well as didactic material (e.g. relationship of stress to illness). Participants are encouraged to make a significant time commitment to home practice of techniques during and after completion of the program. This approach was developed by Kabat-Zinn and colleagues at the University of Massachusetts Medical Center and has demonstrated efficacy among a variety of clinical populations (e.g. patients with chronic pain, cancer, generalized anxiety). The authors reviewed ten published studies that examined the effectiveness of MBSR on students and clinicians from multiple disciplines. Overall findings indicate that MBSR seems to reduce stress, anxiety, and burnout among students and clinicians. However, the authors identify some significant conceptual and methodological limitations in the existing literature. Gaps for further study include the following: specific aspects of the program that were most effective; mechanisms through which MBSR may contribute to positive outcomes; dose-response relationships (based on home practice time commitment); influence of behavior variables on

outcomes; qualitative measures; physiological measures; potentially harmful or negative effects; effects in diverse populations; and impacts on patient care.

Contribution: Research suggests that MBSR programs may be an effective and viable tool for promoting self-care skills and the wellbeing of trainees and clinicians. However, the existing body of research has some significant conceptual and methodological limitations. The authors call for further research to better understand the application of mindfulness training and provide evidence-based recommendations for optimizing outcomes.

Cost: Unknown.

Krasner MS, Epstein RM, Beckman H, *et al.* Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA* 2009;302(12):1284-93. doi: [10.1001/jama.2009.1384](https://doi.org/10.1001/jama.2009.1384).

Impetus: This study was designed to evaluate the effectiveness of an intensive educational program focused on mindful communication.

Description: This intervention consisted of eight weekly sessions, a silent retreat, and 10 monthly maintenance sessions, totaling 52 hours. Participants did not have to pay for the course and also received CME credits for participating and \$250 for survey completion. The course focused on mindfulness meditation, self-awareness exercises, narratives of clinical experiences, didactic material, and discussion. The effectiveness of the program was evaluated using validated scales measuring mindfulness (2-Factor Mindfulness Scale), burnout (Maslach Burnout Inventory MBI), empathy (Jefferson Scale of Physician Empathy), psychosocial orientation (Physician Belief Scale), personality (Mini-markers of the Big Five Factor Structure), and mood (Profile of Mood States, POMS). These surveys were distributed at a total of five time points: (1) at the time of registration (a mean of 37 days before the start of the program); (2) at the beginning of the first session; (3) at the conclusion of the eighth weekly session; (4) at the conclusion of the last monthly session; and (5) three months after the program ended. There were improvements in all the validated outcome measures; mindfulness scores had the largest effect sizes. The Maslach Burnout Inventory had a medium-sized improvements across all three subscales. Empathy also significantly improved. Additionally, the physician belief scale improved significantly, suggesting a shift toward greater value placed on understanding the patient's emotional and social life in addition to disease-related factors. The Profile of Mood States showed moderate effect sizes in the total score and the depression, anger and fatigue subscales, with a smaller effect size for vigor. Personality traits of conscientiousness and emotional stability showed small to moderate improvements.

Contribution: The authors of this study found that participation in an intensive mindful communication program was beneficial for primary care physicians. This study showed improvements in all of the tested outcome measures, and the benefits of this program were shown to be sustained over time. While the intervention was shown to be effective, the uncontrolled nature of the study limits its methodological strength.

Cost: Unknown, although participants did not have to pay for the course and received CME credits for participating and \$250 for survey completion.

Oman D, Hedberg J, Thoresen CE. Passage meditation reduces perceived stress in health professionals: A randomized, controlled trial. *J Consult Clin Psychol* 2006;74(4):714–9. doi: [10.1037/0022-006X.74.4.714](https://doi.org/10.1037/0022-006X.74.4.714).

Impetus: Meditation interventions have increasingly been associated with stress reduction and improved health outcomes in clinical populations in scientific literature. However, critics have argued that much of this research suffers from methodological shortcomings. This randomized controlled trial aimed to understand the potential impact of passage meditation training on perceived stress reduction for health professionals.

Description: This randomized controlled study measured the impact of an eight-week training for health professionals using secular, spiritually-based tools based on the Eight-Point Program (EPP) meditation. EPP utilizes a variety of methods to integrate meditation into daily living: (1) passage meditation, the silent repetition of an inspirational passage from major religious tradition of one's choosing; (2) repetition of a holy word or mantra; (3) slowing down; (4) practicing focused, one-pointed attention; (5) training the senses; (6) putting others first; (7) spiritual association with others following EPP; and (8) inspirational reading from major spiritual figures and religious scriptures. Participants were recruited via in-service talks, flyers, and word-of-mouth communication, and subsequently randomized to the intervention arm (n=27) or the wait list control arm (n=31). The intervention group included physicians, nurses, chaplains, and other health professionals who met for two-hour weekly sessions. Participants completed surveys pre-and post-intervention, and at 8- and 19-week follow-up intervals with eight validated measures: Perceived Stress Scale, Maslach Burnout Inventory, the mental health and vitality subscales from the Medical Outcomes Study, and Satisfaction With Life Scale (SWLS). Results showed beneficial effects on mental health and a large decrease in perceived stress that was sustained through the 19-week follow-up. Interestingly, findings indicate that the stress reduction and mental health benefits were greater for participants who identified as only moderately or less spiritual relative to those who identified as highly spiritual. Limitations included the small sample size and the lack of assessment of participants' prior practices.

Contribution: This research suggests that secular, spiritually-based tools based on the Eight-Point Program (EPP) meditation may benefit health professionals by reducing perceived stress and improving mental health. This study was a randomized trial with excellent retention (90%). Future research should evaluate generalizability and sustainability, and include qualitative analysis to study potential moderating variables (e.g., personality) that may influence outcomes.

Cost: Unknown.

Mind-Body Interventions

Medical Students

Kraemer MK, Luberto CM, O'Bryan EM, et al. Mind-body skills training to improve distress tolerance in medical students: a pilot study. *Teach Learn Med* 2016;28(2):219-228. doi: [10.1080/10401334.2016.1146605](https://doi.org/10.1080/10401334.2016.1146605).

Impetus: Throughout medical education, stressful work environments can result in high rates of psychological distress for learners. However, distress tolerance, defined as the ability to withstand emotional distress, is considered to be protective against psychological distress and can be improved through mind-body training. This study aimed to describe the facets of distress tolerance in medical students

who engaged in the mind-body training, to examine the relationship between psychological distress and distress tolerance, and to report the students' perceptions of the mind-body intervention.

Description: The intervention was an 11-week skills training workshop that focused on mind-body skills such as biofeedback, guided imagery, relaxation, meditation, breathing exercises, and autogenic training. The study recruited 52 first and second year medical students who were enrolled in either the mind-body intervention or a control group. All participants completed the Distress Tolerance Scale (DTS), Cognitive and Affective Mindfulness Scale-revised (CAMS-R), Perceived Stress Scale (PSS-10), and Positive Affect Negative Affect Schedule (PANAS) before and after the 11-week period. The authors found that the students in the mind-body group showed a modest improvement in all distress tolerance subscales over time; the control group showed no change. In addition, they demonstrated that improvements in distress tolerance was also associated with improvements in psychological symptoms.

Contribution: The authors demonstrated that the 11-week mind-body training improved distress tolerance and was correlated with a decrease in psychological distress. They postulate that this is a novel way to improve the wellbeing of medical students and reduce the impact of psychological distress.

Cost: Unknown.

Bond AR, Mason HF, Lemaster CM, et al. Embodied health: the effects of a mind-body course for medical students. *Med Educ Online* 2013;8:1-8. doi: [10.3402/meo.v18i0.20699](https://doi.org/10.3402/meo.v18i0.20699).

Impetus: Medical students are known to experience high rates of stress during their education, with consequent decline in empathy, negative impact on patient relationships, and symptoms of burnout. Mindfulness-based stress reduction (MBSR) programs have been shown to improve anxiety and increase empathy in medical learners. Mind-body practices, including meditative breathing and relaxation, have been shown to enhance self-efficacy and self-regulation.

Description: The intervention was an 11-week elective course, Embodied Health, that combined sessions in yoga, meditation, and neuroscience didactics about mind-body practices for 27 first and second year medical students at Boston University School of Medicine. Students completed pre- and post-course surveys that evaluated four areas: empathy (Jefferson Scale of Physician Empathy), perceived stress (Perceived Stress Scale), self-regulation and goal achievement (Self-Regulation Questionnaire), and self-compassion (Self-Compassion Scale). Students also wrote a reflective post-course essay. Statistically significant changes were seen in self-regulation and self-compassion; a positive but non-significant trend was seen in empathy and perceived stress scores. Results were reinforced by themes within the students' reflective essays, including mind-body reconnection, increased sense of camaraderie with peers, improvement in mindfulness, confidence in using mind-body skills in future patient interactions, and management of stress.

Contribution: This novel course incorporates experiential and didactic teaching of mind-body medicine, but is limited by a small and self-selected sample size, lack of control group, a high empathy baseline rating in students, and no long-term post-course data on student wellbeing. This study suggests a small favorable short-term effect of mind-body medicine on medical student wellbeing.

Cost: Unknown.

Hassed C, de Lisle S, Sullivan G, Pier C. Enhancing the health of medical students: outcomes of an integrated mindfulness and lifestyle program. *Adv Health Sci Educ Theory Pract* 2009;14:387-98. <http://dx.doi.org/ucsf.idm.oclc.org/10.1007/s10459-008-9125-3>.

Impetus: Poor mental health during medical training has been linked to poor personal health behaviors and burnout later in professional careers, as well as lower quality of care indicators, such as prescribing errors. This article explores a wellness curriculum at a medical school aimed at reducing burnout and increasing emotional intelligence through mindfulness-based self-care.

Description: Monash University in Australia developed its Health Enhancement Program (HEP) for their first year medical students in 2002, implemented during the second half of the first semester for the 315 medical students in each class. The curriculum includes mindfulness and mind-body techniques and the “ESSENCE” model for a healthy lifestyle (including of education, stress management, spirituality, exercise, nutrition, connectedness, and environment). The eight core lectures are supplemented by six 2-hour tutorials and self-directed learning. Students keep a journal and meet regularly with a tutor and in small groups. These elements are integrated into other elements of the core curriculum through lecture series, case-based learning, and assessment integrated into assessment of other components of the curriculum and the OSCE. Overall, the HEP curriculum is a significant portion of the first year curriculum, accounting for 10% of the total assessment load. Data before and after the intervention were available for 148 (55%) of students. 90% reported applying mindfulness practice, and there were statistically significant improvements in the depression, hostility, and General Severity Index of the Symptom Checklist-90, and in the psychological domain of the World Health Organization Quality of Life scale.

Contribution: This intervention is one of the longest-standing wellness curricula to be integrated into a core curriculum of a medical school, and although limited by its non-randomized design, demonstrated improvements in wellbeing measures before and after intervention. The assessment strategies are also integrated into the overall medical school assessments in order to avoid marginalizing the wellness curriculum.

Cost: Unknown.

Rakel DP and Hedgecock J. Healing the healer: a tool to encourage student reflection towards health. *Med Teach* 2008;30(6):633-5. doi: [10.1080/01421590802206754](https://doi.org/10.1080/01421590802206754).

Impetus: Research has shown that students’ health and healthy behaviors decline while in medical school and residency. This study aimed to create and evaluate the results of a web-based tool for medical students that would encourage self-reflection, promote positive lifestyle habits, and educate on the foundations of health.

Description: The American Medical Student Association (AMSA) received NIH funding to create a web-based health tool to help medical students develop their own health plan. The tool’s objectives were to encourage self-reflection, promote positive lifestyle habits, and educate on the foundations of health. Students who completed the module were provided with a summary of their self-written health plan and were then asked to complete a questionnaire to assess the effectiveness of the tool. Of the first 500 students and residents to complete the questionnaire, 89.4% of respondents agreed with the statement that the tool improved their understanding of how to maintain personal health, 38.5% agreed that the module would

change their behavior toward improved health, 50.6% agreed that what they learned would help them communicate health concepts to future patients and 83% indicated they learned something new from the module.

Contribution: This study contributes significantly to the literature on self-care and wellbeing of medical students and trainees. The results show that having medical students develop their own health plans can be an effective method towards encouraging self-care and understanding foundational concepts of health and wellbeing.

Cost: Unknown.

Finkelstein C, Brownstein A, Scott C, Lan YL. Anxiety and stress reduction in medical education: an intervention. *Med Educ* 2007;41(3):258-64. doi: [10.1111/j.1365-2929.2007.02685.x](https://doi.org/10.1111/j.1365-2929.2007.02685.x).

Impetus: Stress and burnout are common throughout medicine for practicing doctors, residents and students. Stress reduction programs in medical training have been found to reduce stress in medical students; however, previous studies had no control groups and lacked longer term follow-up. This study aimed to assess the effectiveness of a stress reduction elective on second year medical students, and to determine if improvements would be sustainable.

Description: In 2004, an elective entitled “Mind–Body Medicine: an Experiential Elective” was offered at the University of Washington School of Medicine. The study compared 30 second-year medical students who self-selected to enroll in a 10-week mind body elective to 46 student volunteers who did not enroll in the elective. Students in both groups completed four validated instruments before and after the elective, and three months later: (SCL-90 Anxiety Subscale, Profile of Mood States (POMS), 2-Item Depression Index, and Perceived Stress of Medical School (PSMS). Before the mind body elective, participating students scored significantly higher on the PSMS and SCL-90 instruments than control students, indicating that the elective may have attracted students with more stress and anxiety. At the end of the elective and three months later, there were no differences in scores between the elective and control students in any of the instruments.

Contribution: This study contributes significantly to research surrounding stress-reduction programs in medical training. The positive results of this study support the conclusion that medical students who take a stress-reduction elective course develop sustainable coping skills that help them reduce anxiety and stress.

Cost: Funded by an NIH-NCCAM R25 grant (R25 AT 0813–04).

Interns/Residents/Fellows

Ospina-Kammerer V and Figley CR. An evaluation of the Respiratory One Method (ROM) in reducing emotional exhaustion among family physician residents. 2003;5(1):29-32. PMID: [12722487](https://pubmed.ncbi.nlm.nih.gov/12722487/).

Impetus: In the early 2000’s, many studies had already been published highlighting the increasing amount of stress and burnout experienced by resident physicians. This study was one of the earliest to evaluate the impact of a stress reduction technique, the Respiratory One Method (ROM), on the levels of burnout of family medicine residents. ROM is a meditation technique designed to mitigate the impact of emotional arousal and promote relaxation of the mind and body. The technique involves first taking slow, deep

breaths, then on the exhalation, the practitioner mentally repeats the word “one” (or any other phrase; e.g. “let go”).

Description: Residents who consented to participate in the study were assigned to the intervention group (n=14) or a control group (n=10). This was not a true randomized controlled trial because the residents who were recruited first were immediately assigned to the intervention group, which ran first. The intervention group met once per week for four consecutive weeks. The length of time spent during these weekly meeting was not mentioned, nor how long participants were told to practice the technique. The Maslach Burnout Inventory (MBI) was administered before and immediately after the intervention, and the results of the Emotional Exhaustion subscale were reported. Results showed that participation in the intervention led to a significant improvement in the emotional exhaustion subscale of the MBI.

Contribution: This small, controlled study showed that teaching family medicine residents a breath awareness technique, such as the ROM, could lower emotional exhaustion at the end of the 4 week intervention. However several limitations could influence the interpretation of the results: it is not clear how long the weekly sessions lasted, nor for how long (or frequently) the intervention participants were asked to practice the ROM. Additionally, all four group means fall in the low range of the MBI subscale, so whether the intervention can improve moderate or severe emotional exhaustion is unclear.

Cost: Unknown.

Practicing Physicians

Kemper KJ and Khirallah M. Acute effects of online mind-body skills training on resilience, mindfulness, and empathy. *J Evid Based Complementary Altern Med* 2015;20(4):247-53. doi: [10.1177/2156587215575816](https://doi.org/10.1177/2156587215575816).

Impetus: Prior to this study, several investigations had shown positive impact of mind-body interventions on stress/distress of medical professionals. This study sought to evaluate the effects of 1-hour online elective mind-body skills training modules for health professionals.

Description: This was a prospective study using data collected as part of an ongoing online elective educational program in Mind-Body Skills Training (MBST) at Ohio State University. There were 12 1-hour modules, three for each of four types of mind-body skills: focused attention meditation (relaxation response), mindfulness, guided imagery and hypnosis (including autogenic training), and positive affect-generating meditation (such as gratitude and loving-kindness). The study enrolled 513 professionals: dietitians, nurses, physicians, social workers, clinical trainees, and health researchers. Outcome measures were the Perceived Stress Scale, Cognitive and Affective Mindfulness Scale-Revised, Mindful Attention Awareness Scale, Brief Resilience Scale, and the Interpersonal Reactivity Index (empathic concern and perspective taking subscales). There was a low completion rate: of the 1031 total MBST registrants, 513 completed one or more modules and 42 completed all 12 modules; therefore, the authors analyzed data from the five modules that had at least 100 enrollees within the study period. Significant improvement was seen in mindfulness, perceived stress, empathic concern and perspective taking.

Contribution: This study showed that the completion of online MBST modules may be beneficial to a variety of health professionals. Completion rates were low, so only the 5 modules with 100 participants

were evaluated for impact. However, positive effects were seen in multiple domains. Web-based modules should be further studied.

Cost: Unknown.

Stress Management

Interns/Residents/Fellows

Martins AE, Davenport MC, Del Valle MP, et al. Impact of a brief intervention on the burnout levels of pediatric residents. *J Pediatr (Rio J)* 2011;87(6):493–8. doi: [10.2223/JPED.2127](https://doi.org/10.2223/JPED.2127).

Impetus: Most successful interventions for reducing burnout are lengthy and impractical for the busy clinical schedules of resident physicians. This study aimed to estimate the prevalence of burnout among pediatric residents at a tertiary care pediatric hospital (Hospital General de Niños Pedro de Elizalde in Buenos Aires, Argentina) and to evaluate the effectiveness of a short intervention to reduce burnout among resident physicians.

Description: Seventy-four pediatric residents were recruited for this randomized controlled trial. The intervention included two 2.5-hour self-care workshops over the course of two months that focused on repercussions of burnout, recognition of burnout risk, and coping mechanisms. All residents completed the Maslach Burnout Inventory (MBI) at the beginning and end of the intervention period. The authors demonstrated that the prevalence of burnout among pediatric residents was 66% and was significantly higher among third-year residents. The brief intervention had a statistically significant impact on depersonalization among residents who participated in the brief intervention, but not on emotional exhaustion.

Contribution: This study demonstrated that 66% of pediatric residents in a tertiary hospital in Argentina experience burnout. While there was no significant improvement in overall burnout, residents participating in the intervention had less depersonalization. The study provides important lessons for developing future interventions for resident physicians.

Cost: Unknown.

Milstein JM, Raingruber BJ, Bennett SH, et al. Burnout assessment in house officers: evaluation of an intervention to reduce stress. *Med Teach* 2009;31(4):338–341. doi: [10.1080/01421590802208552](https://doi.org/10.1080/01421590802208552).

Impetus: Medical house officers are vulnerable to stressors that can lead to burnout, professional ineffectiveness, illnesses, and psychiatric morbidities. This study aimed to evaluate the efficacy of a self-administered psychotherapeutic intervention in reducing burnout symptoms over a three-month period for pediatric residents at the University of California Davis Health System.

Description: This study assigned 15 pediatric residents to a control or intervention group and evaluated baseline Maslach Burnout Inventory (MBI) scores for both groups. Residents assigned to the intervention group attended a 45-minute didactic session on the use of the self-administered **BATHE** psychotherapeutic technique, where one reflects on the **B**ackground of a stressful situation, examines one's **A**ffect, analyzes **T**roublesome aspects of the situation, reflects upon how one **H**andled the situation, and provides oneself

Empathy. Baseline survey results were similar for both control and intervention groups. Post-intervention, the MBI scores did not change significantly in the intervention group. Qualitative interviews indicated that residents experienced stressors related to their work; some reported already utilizing elements of the BATHE tool, while others felt they were too busy to implement it regularly.

Contribution: The self-reflective exercise, BATHE, was not shown to reduce burnout among pediatric residents. Time constraints were a reported barrier.

Cost: Unknown.

Practicing Physicians

Wetzel C, George A, Hanna GB, et al. Stress management training for surgeons-a randomized controlled, intervention study. *Ann Surg* 2011;253(3):488-94. doi: [10.1097/SLA.0b013e318209a594](https://doi.org/10.1097/SLA.0b013e318209a594).

Impetus: Among surgeons, the impact of stress on surgical performance is well established. Effective coping with stress has been shown to positively impact surgical outcomes. This study, conducted on surgical residents training at St. Mary's Hospital in London, England, sought to measure the impact of Stress Management Training (SMT) on reducing stress and improving surgeon performance.

Description: In this randomized controlled intervention study, 16 surgical residents (of whom 15 were male) were enrolled and underwent two simulations of emergencies in carotid endarterectomies. The intervention group received training on surgical coping strategies, mental rehearsal, and relaxation techniques. Outcome measurements included direct observation of performance, heart rate measurement, salivary cortisol levels, and an anxiety questionnaire (state-trait-anxiety-inventory). The number of applied surgical coping strategies was assessed using a questionnaire. Results show that SMT improved teamwork, increased coping skills and reduced stress (measured by HRV, heart rate variability). There was a trend towards improved technical skills and operative outcome.

Contribution: This study nicely demonstrated that an organized training paradigm can reduce stress, improve team performance and enhance coping skills in surgery residents. It is unclear what impact the intervention had on short- or long-term standard measures of physician wellbeing; however, the intervention was well received.

Cost: No costs were discussed. This study was done within a residency program and investigated stress reduction using simulations.

Sood A, Prasad K, Schroeder D, Varkey P. Stress management and resilience training among Department of Medicine faculty: A pilot randomized clinical trial. *J Gen Intern Med* 2011;26(8):858-61.

doi: [10.1007/s11606-011-1640-x](https://doi.org/10.1007/s11606-011-1640-x).

Impetus: Physician distress, anxiety, and burnout are known to lead to medical errors, physician attrition, loss of empathy, poor mental health, and loss of idealism. Academic physicians are particularly at risk for increased stress and burnout. This study investigates the utility of Stress Management and Resiliency Training (SMART) in promoting resilience and decreasing stress among Department of Medicine faculty.

Description: This pilot study randomized 40 faculty members from the Department of Medicine at the Mayo Clinic in Rochester, Minnesota into either the SMART intervention or wait-list control group. The

intervention consisted of a single 90-minute one-on-one training in the SMART program, which was adapted from Attention and Interpretation Therapy (AIT), and involved attention- and flexible-approach training, as well as training in relaxation using paced breathing meditation. Each participant completed pre- and post-study validated outcome measures: Connor Davidson Resilience Scale (CDRS), Perceived Stress Scale (PSS), Smith Anxiety Scale (SAS) and Linear Analog Self-Assessment Scale (LASA). The SMART Intervention group reported a significant improvement in resilience, stress, anxiety, and overall quality of life.

Contribution: This study demonstrated that physician anxiety, stress, resilience and overall quality of life significantly improved in practicing physicians who participated in SMART. Most remarkable is that the intervention was a single 90-minute program; however, the one-on-one format potentially limits generalizability to large number of participants. Group sessions using SMART should next be evaluated.

Cost: Unknown.

Rowe MM. Four-year longitudinal study of behavioral changes in coping with stress. *Am J Health Behav* 2006;30(6):602-12. <https://doi.org/10.5993/AJHB.30.6.7>.

Impetus: Health care workers are at risk for stress, anxiety, and burnout. Coping skills play an important role in enabling health care workers to effectively deal with stress. This study examines the effect on health care performance of stress-management training designed to enhance coping skills.

Description: This longitudinal 4-year study examined the effect of “stress management /adaptive coping training” on health care worker performance using validated measurement tools: Cognitive Hardiness Scale, Stress Assessment Inventory, and Maslach Burnout Inventory. 108 health care professionals were randomly divided into three groups after taking the initial survey. Group 1 received training once per week lasting ninety minutes over the course of six weeks. Group 2 received the same training as Group 1, but also received a one hour refresher course at five months, 11 months and 17 months. Group 3 was the control group and received no training. All three groups completed the questionnaire packet pre- and 2-weeks post-intervention, as well as at 6 and 12 months, and 2, 2.5 years and 4 years from the initiation of the study. The control group’s emotional exhaustion scores were significantly higher than those of both experimental groups, and emotional exhaustion scores in Group 2 were significantly lower than those in Group 1 at the 1-year mark and in subsequent measurements. The control group’s depersonalization scores were higher than the scores in both experimental groups at the 6-month mark, but at the 1-year mark, only Group 2 had significantly lower depersonalization scores. Sense of personal accomplishment was significantly lower in the control group, but only at the 2 month and 6 month marks compared to Group 1, and at the 1, 2 and 2.5 year marks compared to Group 2.

Contribution: The authors concluded that health care workers can be taught and trained to develop coping skills that reduce stress and risk for burnout. Refresher courses were effective in maintaining and strengthening coping skills over the four years of the study.

Cost: The costs were not discussed. However, a masters’ level stress management instructor conducted the training. Health care workers were given time off from their work schedules to complete this course.

Milstein JM, Gerstenberger AE, Barton S. Healing the caregiver. *J Altern Complement Med* 2002;8(6):917–20. doi: [10.1089/10755530260511919](https://doi.org/10.1089/10755530260511919).

Impetus: Physicians must cope with significant stress, especially after a critical incident. Poor emotional processing has been associated with burnout, drug and alcohol addiction, mood disorders and suicide.

Description: The authors present BATHE, a debriefing system to be used by physicians after any challenging encounter. BATHE is an acronym for a psychotherapeutic technique, where one reflects on the **B**ackground of a stressful situation, examines one's **A**ffect (names the predominant emotion felt), analyzes **T**roublesome aspects of the situation, reflects upon how one **H**andled the situation, and provides oneself **E**mpathy. This publication used a case-presentation format to introduce the technique to residents. No outcomes were measured.

Contribution: Although limited by a lack of outcome data, this strategy introduce a strategy to help physicians cope with grief, sadness and the challenges of taking care of seriously ill patients. BATHE may help the caregiver address emotions and stress on their own or within a small group and offers a practical and simple strategy to increase awareness of one's own suffering, leading to heightened attentiveness to one's wellbeing and self-care.

Cost: Unknown.

Winefield H, Farmer E, Denson L. Work stress management for women general practitioners: an evaluation. *Psychol Health Med* 1998;3(2):163–70. <http://dx.doi.org/10.1080/13548509808402232>.

Impetus: Sources of stress can be gender-specific. The publication addresses the unique challenges of female general practitioners (GP) in Australia, by examining the impact of an educational intervention.

Description: Twenty women general practitioners in Australia participated in a stress management intervention delivered through a series of three 3-hour seminars. The seminars were conducted every two weeks in the evenings, each focusing on relevant topics such as satisfaction of work, social support, changing expectations. Participants completed standardized evaluations and measures of psychological distress, job satisfaction, burnout at baseline and four weeks after the seminar. Participants had high psychological distress, high job satisfaction, and high emotional exhaustion at baseline. The follow-up survey showed statistically significant improvements in job-related distress and emotional exhaustion.

Contribution: This study showed that baseline psychological distress and burnout were high in a small group of female general practitioners in Australia. The intervention reduced work-related distress and emotional exhaustion in these GPs.

Cost: Unknown.

Counseling Services

Medical Students

Thompson D, Goebert D, Takeshita J. A program for reducing depressive symptoms and suicidal ideation in medical students. *Acad Med* 2010;85(10):1635–9. doi: [10.1097/ACM.0b013e3181f0b49c](https://doi.org/10.1097/ACM.0b013e3181f0b49c).

Impetus: The University of Hawaii John A. Burns School of Medicine, Honolulu, Hawaii found high rates of depression and suicidal ideation in a confidential survey of third year medical students. The purpose of this study was to develop an intervention that would reduce depressive symptoms and suicidal ideation in their third year students.

Description: The intervention was multi-pronged and consisted of (1) increased individual counseling for students, (2) faculty education about recognizing and responding to student depression, and (3) a specialized curriculum for students, including lectures and a student handbook. In particular, focus was made on having anonymous counseling available to students. The Center for Epidemiologic Studies Depression Scale and a question about suicidal ideation from the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire was used to measure depressive symptoms both before and after the intervention. Investigators saw a 35% reduction in depressive symptoms and a 27% reduction in suicidal ideation.

Contribution: This study corroborates other studies demonstrating that minimal interventions helping students and faculty to recognize depression and connect to care can be effective in decreasing suicide ideation.

Cost: The Queen Emma Research Fund at the Queen's Medical Center supported this project. Students were able to see psychologists, psychiatrists, and master-level counselors staff the University Counseling Center free of charge through their health benefit (usually limited to 12 sessions) or to request outside referrals at the rate of \$25 per session without supplemental funding.

Interns/ Residents/Fellows

Guille C, Zhao Z, Krystal J, et al. Web-based Cognitive Behavioral Therapy intervention for the prevention of suicidal ideation in medical interns: a randomized clinical trial. *JAMA Psychiatry* 2015;72(12):1192-8. doi: [10.1001/jamapsychiatry.2015.1880](https://doi.org/10.1001/jamapsychiatry.2015.1880).

Impetus: Data from the American Foundation for Suicide Prevention show that approximately one physician dies by suicide every day in the US (300-400 annually). Suicidal ideation is common during all of training, and may be especially high during internship. This study examines whether participation in a web-based Cognitive Behavioral Therapy (wCBT) intervention can decrease suicidal ideation (SI) among interns.

Description: This RCT was performed in 2 large academic centers (Yale University and University of Southern California) and enrolled interns in many different disciplines (internal medicine, surgery, obstetrics/gynecology, pediatrics, psychiatry, neurology, emergency medicine, and medicine/pediatrics). Interns were randomized to the wCBT group (n=100) or an Attention Control Group (n=99); randomization was successful. The intervention group were directed via email each week for 4 weeks to the intervention website <http://moodgym.anu.edu.au> to complete a CBT module each week. The control group received an email once weekly for four weeks with information about the symptoms of mental illness and where to

obtain local mental health treatment. Brief refresher emails were sent at months 2, 5, 8 and 11: the wCBT participants were asked to return to the website and review a module of their choice, while the control group was sent the same email as before. SI was measured using the question from the PHQ-9 “thoughts that you would be better off dead, or hurting yourself”. The response was considered positive if the intern responded to frequencies of “several days” “more than half the days” or “nearly every day” over past two weeks. Results showed that uptake of the intervention was good: 88% (88/100) completed at least one wCBT module; 78% completed two; 65% completed three; 51% completed all four modules; and 82% went back and reviewed at least one module. The wCBT interns were 60% less likely to endorse SI during the entire year (RR 0.40; 95% CI 0.17-0.91; $P=0.03$). Effect size was 1.97. The NNT was 11, meaning that for every 11 interns, taking part in the intervention would prevent one intern from having SI. This protective effect was sustained over the entire year.

Contribution: This exceptionally well done study shows that participation in a web-based CBT intervention can significantly decrease SI in interns in a variety of medical specialties.

Cost: The intervention web site is free and the reminder emails can be coordinated by a program administrator. The cost-benefit ratio for this study is outstanding.

Practicing Physicians

Isaksson Ro KE, Tyssen R, Hoffart A, *et al.* A three-year cohort study of the relationships between coping, job stress and burnout after a counselling intervention for help-seeking physicians. *BMC Public Health* 2010;10:213. doi: [10.1186/1471-2458-10-213](https://doi.org/10.1186/1471-2458-10-213).

Impetus: Prior to this study, the efficacy of counseling interventions in physicians had not been well studied. This is a 3-year study evaluating the how coping strategies, job stress and personality traits can impact burnout.

Description: This is a prospective cohort study of 227 physicians who were enrolled in one of two possible counseling interventions for burnout while at the Resource Centre Villa Sana, Norway from 2003-2005. Physicians chose to participate in one of two different interventions. The first was a single 6-7 hour counselling session for one physician with a psychiatrist or a specialist in occupational medicine (MD). The second intervention was a five day, group-based course led by a counsellor in collaboration with an occupational therapist. Assessments were taken at baseline, one-year, and three-year after the intervention. The main outcome measures studied were emotional exhaustion (Maslach Burnout Inventory, emotional exhaustion (EE) subscale, but scored using Norwegian standards), job stress (Cooper Job Stress Questionnaire), coping strategies (Ways of Coping Checklist) and the personality trait of neuroticism (Eysenck's abbreviated personality questionnaire with six items for neuroticism). 169/227 (74%) participants submitted data for all three time-points. Despite this relatively good retention, the participants lost to follow-up were more often men and had higher levels of distress (emotional exhaustion and job stress) at baseline. Results show significantly reduced level of emotional exhaustion, job stress and emotion-focused coping both at 1-year and 3-years post intervention, with a moderate effect size in the reductions of all three outcomes. Additionally, there was a significant reduction in the proportion of participants who were on sick leave at follow-up (both at one- and three-years) compared with baseline; this finding indicates a possible enhanced work capacity.

Contribution: This paper adds to a growing body of literature that suggests that giving physicians effective coping strategies helps over the long-term, even if these interventions are short bursts and do not have longitudinal follow-up. Additionally, it provides a cost-benefit argument for sustained funding of the intervention.

Cost: Unknown. The Resource Centre is available for all Norwegian physicians. It is funded by the Norwegian Medical Association and is located at a psychiatric facility, Modum Bad.

FACILITATED GROUP INTERVENTIONS

Narrative Medicine / Reflection Time

Medical Students

Arntfield SL, Slesar K, Dickson J, Charon R. Narrative medicine as a means of training medical students toward residency competencies. *Patient Educ Couns* 2013;91(3):280–6. doi: [10.1016/j.pec.2013.01.014](https://doi.org/10.1016/j.pec.2013.01.014).

Impetus: This study aimed to understand the potential impact of narrative medicine training on clinical skill development of fourth-year medical students using a mixed-methods approach. Previous narrative medicine studies have demonstrated improvements in team cohesion and perceptions of others' perspectives while decreasing burnout. This study focused primarily on the impact of narrative medicine on ACGME mandated competencies in areas of communication, collaboration, and professionalism.

Description: This study used a grounded theory approach to understand the impact of narrative medicine on both the process of training and its influence on clinical skills. Twelve fourth-year medical students volunteered to participate in a one-month narrative medicine elective. The impact of the elective was evaluated by initially by a survey using open-ended questions (response rate was 11/12, 91%). These answers were used to generate exploratory questions for a focus group (6/12, 50% of the enrolled students participated). Lastly, a few open ended questions were sent at 18 months to all participants (response rate 3/12, 25%). Through iterative thematic analysis, 5 themes emerged: students perceived that attending the sessions (1) helped them develop and improve specific communication skills; (2) enhanced their capacity to collaborate, empathize, and deliver patient-centered care; (3) emphasized that regular self-reflection and reflection about the practice of medicine was valued and felt to be important for personal and professional development; (4) demonstrated that learning narrative medicine methodology was critical to their positive experience; and (5) helped them realize that narrative medicine training is misunderstood by others and perceived as counter-culture.

Contribution: This mixed-methods study contributed to the evidence that narrative medicine can improve physician communication, collaboration and professional identity formation; however, misconceptions about this practice still exist at the medical student level.

Cost: Unknown.

Interns/Residents/Fellows

Winkel AF, Hermann N, Graham MJ, Ratan RB. No time to think: making room for reflection on obstetrics and gynecology residency. *J Grad Med Educ* 2010;2(4):610–5. doi: [10.4300/JGME-D-10-00019.1](https://doi.org/10.4300/JGME-D-10-00019.1).

Impetus: Narrative medicine and reflective practice may help physicians to find meaning and value in their work. There are few studies describing narrative medicine interventions with obstetrics and gynecology (OB-GYN) residents.

Description: Reflective writing workshops (one hour long) were built into scheduled didactic curricular time every six weeks for a total of six sessions over the year. All OB/GYN residents (20 total) in a large academic center were offered the workshops. Topics for the sessions were generated by a resident focus group and final topics were selected by residents via ranking survey, thus increasing buy-in: the topics were life balance, fatigue/frustration, managing expectations, emotional reactions, fear of causing harm, and team

relationships. The sessions included a short reading followed by facilitated discussion and brief written reflection. The intervention was evaluated with pre-and post-intervention administration of the Maslach Burnout Inventory and the Interpersonal Reactivity Index and with a post-intervention satisfaction survey. There was no difference in burnout or reactivity before and after the intervention, although resident satisfaction evaluations showed high acceptance and enjoyment, and some residents reported that it “impacted their experience of residency.”

Contribution: This study is one of few that describes incorporation of a narrative medicine intervention into a residency program for a surgical field, and is therefore a useful addition to prior studies that primarily involved non-surgical fields such as internal medicine and pediatrics. Although the study was a pre-post design rather than a randomized intervention and may have been underpowered to detect changes in burnout, it demonstrates the feasibility of incorporating a wellbeing intervention into a didactic curriculum in an obstetrics and gynecology program, and therefore may be an appealing intervention for similar programs.

Cost: Unknown.

Sikora R, Mongold B, Sedgeman J, Davis SM. Burnout in emergency medicine residents and faculty: an attempt to modify stress response by journaling. *Ann Emerg Med* 2008;51:508. Abstract <http://dx.doi.org/10.1016/j.annemergmed.2008.01.090>.

Impetus: Although written reflection is hypothesized to improve wellbeing, few studies exist describing its impact. The authors sought to measure whether journaling improved burnout in emergency medicine physicians.

Description: Eighteen faculty and residents at a university medical center were randomized to three arms: one control group and two intervention groups assigned to journal after each shift for one month. One intervention group completed directed journaling on specific topics while the other intervention group used free-form, unstructured journaling. All participants completed the Maslach Burnout Inventory (MBI) and submitted salivary cortisol samples before and after the intervention, and the intervention participants participated in a post-intervention interview. There were no significant changes in burnout as measured by the MBI or salivary cortisol between groups over time. There was no description whether the impact of this experience was different between faculty and resident respondents.

Contribution: This pilot study is strengthened by the randomized design with two intervention arms and the addition of biomarker testing, although it was unable to detect a difference among groups, possibly due to the small size and short duration of the intervention.

Cost: Unknown.

Brady DW, Corbie-Smith G, Branch WT. “What's important to you?” The use of narratives to promote self-reflection and to understand the experience of medical residents. *Ann Int Med* 2002;137(3):220-3. [PMID: 12160380](#).

Impetus: Narratives may improve self-reflection about the experience of residency. Here, the authors describe themes from longitudinal tracking of narratives written by housestaff over the course of residency.

Description: Internal medicine residents in a primary care program at a large academic program wrote narratives twice during their first year of residency and once during their second and third years of residency. They had the option of sharing their writings with each other, with a goal of improving self-reflection skills. Themes from the narratives progressed from search for professional identity and core values in early internship; to disillusionment by the end of internship; to disillusionment and despair during the second year of residency; and finally, to hope and acceptance by the end of residency. No description of an evaluation of the intervention is provided.

Contribution: This publication was one of the first to describe formal incorporation of written reflection into a residency curriculum. Although limited by the lack of randomized design or evaluation data, the emergent themes from longitudinal tracking of resident narratives provide valuable insights into the resident experience to inform future interventions.

Cost: Unknown.

Practicing Physicians

Rabow MW and McPhee SJ. Doctoring to heal: fostering wellbeing among physicians through personal reflection. *West J Med* 2001;174(1):66-9. PMID: [11154679](#).

Impetus: Development of personal awareness skills can help physicians to recognize joys and successes and cope with difficulties of being a practicing physician. Prior to this publication, little information related to the benefits of writing reflection groups existed in the literature.

Description: This study describes a small group reflection intervention called “Doctoring to Heal” with attending and resident physicians in the Division of General Internal Medicine at the University of California, San Francisco. The authors organized evening, opt-in discussion groups that were open to all faculty and residents; 70% of the invited population participated in at least one session. Average group size was 12 (range 6-37). The structure of the session included informal socialization (sharing a meal) followed by brief written reflection using a topical prompt (examples are included in the paper), followed either by participants reading their own piece or randomly selecting someone else’s reflection from a stack for anonymous sharing. A facilitated group discussion followed after all written reflections were shared. The evaluation method is not specified but participants reported qualitative improvements in professional identity, connectedness with colleagues, self-awareness skills, and balance/personal wellbeing.

Contribution: This paper provides a concrete description of a reflection session that incorporates both written reflection and small group discussion that can be adapted to many practice settings. Although the strength of evidence is limited by lack of evaluation of wellbeing outcome measures, the self-reported improvements in wellbeing as a result of this intervention indicate that it is likely to be beneficial and well-received by participants.

Cost: Unknown.

Balint / Small Group Support

Medical Students

Holm M, Tyssen R, Stordal KI, Haver B. Self-development groups reduce medical school stress: a controlled intervention study. *BMC Med Educ* 2010;10:23. doi: [10.1186/1472-6920-10-23](https://doi.org/10.1186/1472-6920-10-23).

Impetus: Stress among medical students is a well-recognized problem with consequences on student mental health, quality of life and performance. However, at the time of this article the quality of data on group interventions was low and there had not been any mandatory programs that had been published.

Description: An entire medical student class in a large medical school in Norway (n=129) was enrolled in mandatory group intervention sessions during their third (clinical) year. They were compared with the subsequent third-year class that acted as a quasi-experimental control group. The intervention consisted of 12 weekly group sessions, each lasting 90 minutes. Participation was mandatory, but students were allowed to choose between two different types of group interventions. “Self-development” groups were based on the model of therapy groups and led by psychiatrists trained in group analytic treatment. This arm of the study sought to improve students' positive resources and personal lives, to increase students' self-esteem and to develop students' personal insights. The second option was “discussion” groups, which were led by experienced general practitioners and included discussion about different topics relevant to students' clinical experiences (e.g. how to handle stress at work, balancing professional and private life, how to handle and communicate with difficult patients, how to “break bad news”). Validated outcome measures were perceived stress (Perceived Medical School Stress (PMSS) scale) and mental distress (SCL-5 of the Hopkins Symptom Checklist, SCL-90). Assessment was completed by both intervention and control groups before and three months after the end of the intervention. Results showed that only the self-development group participants showed a significant reduction in the Perceived Medical School Stress (PMSS) scale. Neither intervention had an effect on mental distress. Qualitatively, the discussion groups were evaluated as being more popular by the students, compared to the self-development groups.

Contribution: This study is unique in that it investigated the impact of mandatory group interventions for clinical medical students and had two intervention arms comparing “self-development” to general “discussion” groups.

Cost: Unknown. Groups were led by psychiatrists or general practitioners, each of whom needed to be available for 12 90-minute sessions during work hours.

Interns/Residents/Fellows

Ripp JA, Fallar R, Korenstein D. A randomized controlled trial to decrease job burnout in first-year internal medicine residents using a facilitated discussion group intervention. *J Grad Med Educ* 2016;8(2):256-9. doi: [10.4300/JGME-D-15-00120.1](https://doi.org/10.4300/JGME-D-15-00120.1).

Impetus: Facilitated group discussion has been shown to decrease burnout among self-selected practicing physicians. This study examined the effect of required facilitated group discussion on burnout for first year IM residents at a large academic medical center in NYC.

Description: Incoming first year internal medicine residents were randomly assigned to intervention or control groups (total n=51; 39 of whom completed both surveys). The intervention groups were designed to be 1-hour meetings twice per month for nine months. The groups were facilitated by psychotherapists with expertise in facilitating group discussion; self-development psychotherapy, however, was not part of the intervention. Sessions were not held in place of existing educational meetings; rather, they were in addition to the daily work expectation for each randomized participant and interns still carried their pagers and could be interrupted. Each session was organized around a theme (e.g. death and dying, coping mechanisms, difficult patients, etc.). The primary outcome was burnout (Maslach Burnout Inventory) and secondary outcomes included items related to sub-optimal patient care, professional behavior and fatigue (Epworth Sleepiness Scale). Results showed that there was no significant improvement in any of the outcomes at the study conclusion. Informal feedback from many of the residents noted that they had ongoing clinical responsibilities during this time and that it did not eliminate their other daily requirements, which increased their stress level.

Contribution: This study showed that participation in mandatory “clinical discussion” groups did not improve burnout, or any of the secondary measures. Results were possibly impacted by the fact that these sessions were mandatory yet not protected from clinical duties. This study highlights the importance of having protected and integrated time for any curriculum in order for it to be successful. Additionally, as with the study above (Holm M, et al.), this study adds to the evidence that clinical discussion groups may not be helpful for medical students and interns.

Cost: Fifty-one residents in both the intervention and control arms received lunch eighteen times. Each group was led by an expert facilitator, who was compensated \$100 per session.

Gunasingam N, Burns K, Edwards J, et al. Reducing stress and burnout in junior doctors: the impact of debriefing sessions. *Postgrad Med J* 2015;91:182–187. doi: [10.1136/postgradmedj-2014-132847](https://doi.org/10.1136/postgradmedj-2014-132847).

Impetus: While there are many studies that characterize the presence of burnout among first year junior doctors (interns), there are few interventions that have proven effective in reducing burnout. This study aimed to examine the prevalence of burnout in a cohort of interns and evaluate the effect of debriefing sessions on reducing stress.

Description: This study was a randomized controlled trial that took place over two months in an urban teaching hospital in Sydney, Australia. A convenience sample of 31 interns was randomized into either the intervention group (n=13), which had four debriefing sessions bi-weekly over two months, or the control group (n=18), which had no debriefing sessions. The debriefing sessions were run by senior faculty and lasted for one hour. Discussion topics ranged from the challenges of internship, common worries, coping strategies, work-life balance, support, and job stress. All participants were given the Maslach Burnout Inventory at the beginning and end of the study period to assess for burnout, as well as a written survey evaluation of the intervention. Focus groups of junior doctors were also conducted to assess the impact of the debriefing program. Results showed that at baseline, 68% of interns met criteria for high burnout in at least one of the three domains of the MBI. Interestingly, female interns had higher levels of burnout compared to their male counterparts (13/15 (87%) vs. 8/16 (50%), p=0.029). The association between burnout and gender remained significant after adjusting for age, unrostered hours and relationship status, with adjusted burnout scores for women on average 9.4 points higher than men (95% CI 1.0 to 17.3,

p=0.027). Post-intervention, there was no significant decrease in burnout between the intervention and control groups. However, the debriefing sessions were well received by participants, with 89% identifying the sessions as a source of emotional support and 61% recommending the intervention to other junior doctors.

Contribution: While burnout was not shown to decrease with the debriefing sessions in this study, findings were limited by sample size. Future studies should employ larger sample sizes and longer term interventions to truly evaluate the effectiveness of debriefing session on junior doctor burnout. Additionally, this study adds to the evidence that this type of “discussion/processing/debriefing” group may not be as effective as “self-development” model of therapy groups led by psychiatrists trained in group analytic treatment.

Cost: Unknown.

Wen LS, Baca JT, O'Malley P, et al. Implementation of small-group reflection rounds at an emergency medicine residency program. *CJEM* 2013;15(3):175-7. Abstract [PMID: 23663465](#).

Impetus: Residency training can be a challenging and isolating experience, and there are limited outlets for personal expression and processing. This paper describes the implementation of a novel curriculum, Emergency Medicine Reflection Rounds (EMRR), that sought to promote humanism among and improve the wellbeing of Emergency Medicine residents.

Description: EMRR is a 1-hour monthly small group meeting where residents were encouraged to share ethically and/or personally difficult clinical encounters. These support groups were facilitated by faculty members, and the curriculum evolved based on verbal feedback from the initial nine resident participants. At the conclusion of the intervention, a survey of four questions was distributed to gain feedback about the program. In survey evaluation of the EMRR program, all participating residents felt that the intervention provided a safe space to discuss challenging issues and that participation in the groups improved their wellbeing.

Contribution: This publication highlights an example of a group-based wellness initiative that is reflective in nature and fosters collaborative learning regarding the professional, personal and ethical challenges of being an EM resident. While feedback was positive, the study was limited in size and evaluation methodology. Future studies on similar interventions should employ larger sample sizes and more rigorous evaluation methods.

Cost: Unknown.

Bar-Sela G, Lulav-Grinwald D, Mitnik I. “Balint group” meetings for oncology residents as a tool to improve therapeutic communication skills and reduce burnout level. *J Cancer Educ* 2012;27(4):786–9.

doi: [10.1007/s13187-012-0407-3](#).

Impetus: Oncology training is especially stressful due to the prolonged exposure to death and dying. Balint groups have been shown to improve communication skills, strengthen doctor-patient relationships, and, potentially, reduce burnout. In this study, the authors aimed to quantify the impact of monthly Balint groups on burnout level of oncology residents.

Description: In this study, Balint-type case discussion groups, with 7-17 residents participating in each group, were facilitated for Israeli oncology residents by a senior oncology physician, a senior palliative care physician and a trained clinical psychologist. The groups took place once per month for nine months and consisted of a 1.5 hour discussion of difficult cases that the trainees had encountered. The impact of the program was evaluated by the Maslach Burnout Inventory (MBI) and an expectations questionnaire completed at the beginning and end of the program. The evaluation of the program demonstrated that the oncology residents felt that their communication skills improved throughout the year. There was a trend towards decreased burnout during the year for junior residents; however, this study is limited by size and lack of a control group.

Contribution: This publication adds to the literature that Balint groups are well received and do show a potential benefit, both in perceived communication skills and possibly burnout. However, larger scale studies with a control are still needed.

Cost: Unknown.

Satterfield JM and Becerra C. Developmental challenges, stressors and coping strategies in medical residents: a qualitative analysis of support groups. *Med Educ* 2010;44(9):908-16.

doi: [10.1111/j.1365-2923.2010.03736.x](https://doi.org/10.1111/j.1365-2923.2010.03736.x).

Impetus: Although stress and burnout are well documented among residents, there is minimal research available to guide interventions. The study sought to qualitatively describe the longitudinal emotional and coping needs of medical residents.

Description: Resident support groups were established and followed for two years. Each group included residents from a single training year who met monthly for one hour. Groups were facilitated by a licensed clinical psychologist. Groups included 7-10 residents, all sharing the same outpatient clinic site. Attendance was voluntary, but in order to increase attendance, groups were held in lieu of the first hour of clinic. Detailed notes from all 72 sessions were analyzed using a derivation of grounded theory. Quantitative measurements of burnout (using The Tedium Index, a 21-item questionnaire that assesses physical, emotional, and mental exhaustion), attendance and satisfaction were collected. Attendance was decent but not 100% (given that an hour of clinic was freed up). Satisfaction was excellent (score of 6.56/7). Self-reported wellbeing was high (6.34/7); however, it was not trended across the study interval. Key qualitative themes that emerged included the importance of understanding resident roles and responsibilities, developing a professional identity as both resident and physician, and building professional confidence. Other themes were reported by postgraduate year (PGY), with different themes and emotions reported by residents in different years. Burnout scores were highest among PGY-1 residents in the second half of the year, and burnout decreased in subsequent years. Resident participants emphasized the critical importance of peer relationships as a source of support throughout training. Residents felt that the biggest strength of the groups was building supportive relationships with peers, while the short duration (1 hour) and low frequency of meetings (once per month) were seen as the greatest weaknesses.

Contribution: The information detailed in this paper can be useful for programs initiating orientations for each of the transitions and for guiding thematic content for longitudinal curriculum planning. The Tedium

Index is not a commonly used burnout measure, although the fluctuation in burnout mostly mirrors what has been seen in other longitudinal studies using the Maslach Burnout Inventory.

Cost: Costs were not discussed, but likely included clinical psychologist salary, and qualitative research costs of transcription.

Ghetti C, Chang J, Gosman G. Burnout, psychological skills, and empathy: Balint training in obstetrics and gynecology residents. *J Grad Med Educ* 2009;1(2):231–5. doi: [10.4300/JGME-D-09-00049.1](https://doi.org/10.4300/JGME-D-09-00049.1).

Impetus: With the new ACGME and ACOG (American College of Obstetricians and Gynecologists Council) emphasis on resident professionalism and interpersonal communication skills, this study assessed the impact of an intervention using Balint support groups on burnout, behavioral-medicine skills, and empathy among OB/GYN residents in a large academic medical center. Prior to this study, Balint groups had been shown to enhance understanding of the doctor-patient relationship, help develop empathy, improve job satisfaction and reduce burnout.

Description: The 1-hour Balint groups were scheduled monthly for an entire academic year during mandatory educational time. One group consisted of first- and second-year residents; the other was composed of third- and fourth-year residents. Each monthly session was facilitated by two Balint-trained faculty members. All residents participated in the monthly Balint sessions; however, study enrollment was voluntary and only 17 of 36 residents completed baseline and 12-month questionnaires. Outcome measures included the Psychological Medicine Inventory (which has been used to evaluate the effects of Balint training and assesses residents' levels of interest, ability, or confidence in dealing with psychological aspects of patient care), the Maslach Burnout Inventory, and the Jefferson Scale of Physician Empathy. The majority of participants were first- or third-year residents. High burnout was very prevalent at baseline and trended towards improvement but without statistical significance. The composite Psychological Medicine Inventory scores also showed some non-significant improvement. However, three individual questions on this inventory did have significant improvements: "ability to use consultation from social workers, psychologists, psychiatrists, and community mental-health agencies"; "ability to make appropriate treatment decisions based on patients' psychological needs"; and "ability to be psychologically therapeutic with patients." There was no significant change in empathy scores.

Contribution: This study is limited by its small sample size (17 residents), lack of a control group, and likely selection bias (only 47% of residents enrolled in the study). The low enrollment highlights the challenge of creating and measuring interventions in the resident population. However, participation in 12 monthly Balint groups had significant impact on residents' ability to be psychologically therapeutic with patients, make appropriate treatment decisions based on patients' needs and to utilize consultative services to better meet psychological needs.

Cost: The groups were led by four faculty members, three of whom were credentialed as Balint group leaders. There is no mention of extra reimbursement for faculty time.

Practicing Physicians

West CP, Dyrbye LN, Satele D, Shanafelt TD. A randomized controlled trial evaluating the effect of COMPASS (Colleagues Meeting to Promote And Sustain Satisfaction) small group sessions on physician wellbeing, meaning and job satisfaction. *J Gen Intern Med* 2015;30:S89. Abstract.

doi: [10.1007/s11606-015-3271-0](https://doi.org/10.1007/s11606-015-3271-0).

Impetus: A recently published randomized controlled trial (see following citation) showed that participation in regular facilitated physician support groups improved physicians' sense of meaning and decreased depersonalization; however the intervention was time-intensive (one hour of protected time per week) and thus costly. This study evaluated whether a less time intensive and less structured intervention would also be beneficial.

Description: A total of 125 academic internal medicine faculty volunteered to enroll in the study and were randomized. The intervention arm consisted of bi-weekly small group meetings over six months. The groups were self-formed and the meetings consisted of a 15-minute discussion of an assigned topic (work-life balance, medical mistakes, meaning in work, and resiliency), followed by 45 minutes for a shared lunch or other group activity that was determined by each individual group. Control participants were wait-listed to complete their own small groups at the 6-month mark. Outcome measures included overall quality of life (LASA-QOL), the Maslach Burnout Inventory, the 2-item PRIME-MD depression screen, the Empowerment at Work Scale assessing meaning from work, the Social Isolation PROMIS instrument, and the Physician Job Satisfaction Scale. Surveys were given quarterly. Results showed that participation in the intervention led to significant improvement in overall quality of life, sense of meaning, job satisfaction, social isolation and in the depersonalization and personal accomplishment domains of burnout. Preliminary data collected six months after the intervention ended showed sustained benefits.

Contribution: This study suggests that a less time-intensive and relatively unstructured intervention can have a meaningful and clinically significant impact on several outcomes related to wellbeing.

Cost: The 64 participating physicians received \$20 per session for meal expenses.

West CP, Dyrbye LN, Rabatin JT, *et al*. Intervention to promote physician wellbeing, job satisfaction, and professionalism: a randomized clinical trial. *JAMA Intern Med*. 2014;174(4):527-533.

doi: [10.1001/jamainternmed.2013.14387](https://doi.org/10.1001/jamainternmed.2013.14387).

Impetus: Physician burnout is a well-recognized problem, but most intervention studies focused on individual-level strategies such as mindfulness, which put the onus on the physician to make time to engage in a self-care activity. The goal of this study was to evaluate the impact of participation in facilitated support group sessions, for which the time was protected by the employer. Thus, this study is both an organizational-level intervention as well as a small-group intervention.

Description: A total of 74 academic Internal Medicine physicians were randomized to participate in a facilitated small group session or unstructured protected time. All participants received one hour of protected time every other week. Outcome measures included the Physician Job Satisfaction Scale, the Empowerment at Work Scale, the Medical Outcomes Study Short-Form Health Survey (which measures mental and physical health), the Maslach Burnout Inventory, the Perceived Stress Scale, the 2-item PRIMEMD (which screens for depression) and the Jefferson Scale of Physician Empathy. Quality of life

and fatigue were measured by a single-item linear analog scale. In addition to study participants, 350 physicians not participating in the intervention were also surveyed in the same interval. The intervention group showed significant improvement in empowerment and engagement at work. Rates of high depersonalization also decreased. The proportion of participants strongly agreeing that their work was meaningful also increased whereas the proportion decreased in the control and non-study cohorts, a finding that was statistically significant. These changes were evident by three months after the study and persisted at 12 months. There were no statistically significant changes in stress, symptoms of depression, quality of life or job satisfaction among the intervention group, control group and non-participants. Interestingly, rates of depersonalization, emotional exhaustion, and overall burnout decreased substantially in the trial intervention arm, decreased slightly in the trial control arm, and increased in the non-participants, all of which were statistically significant findings.

Contribution: This study is the first randomized trial evaluating an initiative with employer-provided protected time. Additionally, it showed that participation in a structured small group intervention format had a meaningful impact on several physician wellbeing measures.

Cost: The system supported one hour of paid time every other week (equal to 0.9% full-time equivalent).

Kjeldmand D and Holmstrom I. Balint groups as a means to increase job satisfaction and prevent burnout Among General Practitioners. *Ann Fam Med* 2008;6;138-145. doi: [10.1370/afm.813](https://doi.org/10.1370/afm.813).

Impetus: General practitioners (GPs) face one of the highest burnout rates in medicine and often show signs of exhaustion and job dissatisfaction. This qualitative study aimed to evaluate Balint groups as an intervention to improve general practitioners' satisfaction with their work.

Description: Semi-structured interviews with nine GPs who had Balint groups experience ranging from 3-15 years were transcribed and analyzed using the empirical phenomenological psychological method. Thematic analysis demonstrated that GPs perceived that their Balint group participation influenced their work life by improving competence in the physician-patient encounter (self-awareness, handling difficult emotions, understanding the patient more holistically), professional identity (learning one's limits, increased tolerance towards colleagues), and a sense of security (nurturing relationships with colleagues, not feeling alone, feeling supported). These impacts led to a base of endurance and satisfaction, enabling GPs to "rediscover" the joy of being a physician.

Contribution: This qualitative study highlights the many mechanisms through which Balint groups increase satisfaction with work. Though promising, this is a small study that is based on subjective views of only nine GPs and saturation of themes was likely not reached.

Cost: Unknown.

ACTIVE SELF-IMPROVEMENT

Positive Psychology

Pluskota A. The application of positive psychology in the practice of education. *Pluskota SpringerPlus* 2014;3:147. doi: [10.1186/2193-1801-3-147](https://doi.org/10.1186/2193-1801-3-147).

Impetus: Positive psychology practices have been shown in the general population to enhance happiness and decrease depression. Whether these practices can have applications in education was explored.

Description: This paper outlines the history of positive psychology (distinct from the popular trend of Positive Thinking), and its relevance to the field of education, and provides a description of two positive psychology programs. Positive psychology as a science is based on reorientation around three pillars: positive emotions, positive personality traits and positive social situations. The objective of positive psychology in education is to foster lifelong learning by optimizing functioning, improving mental wellbeing and preventing depression by coaching students to create their own “strength signatures and virtues.” Several intervention programs are described, including the Penn Resiliency Program focusing on promoting optimism, “signature strengths” development, and the Three Blessings program to “support positive emotions.”

Contribution: While this paper is not an intervention study, we have included it because it provides an overview of positive psychology and a description of two interventions, undertaken in education. For those new to the concept, the distinction between positive psychology and positive thinking is nicely outlined. The paper provides a frame shift from thinking about correcting negative behavior(s) to coaching for positive behavior and its impact on learning.

Cost: Unknown.

Gazelle G, Liebschutz JM, Riess H. Physician burnout: coaching a way out. *JGIM* 2014;30(4):508-13. doi: [10.1007/s11606-014-3144-y](https://doi.org/10.1007/s11606-014-3144-y)

Impetus: Professional coaching, frequently used in other fields outside of medicine, may have applications to address physician burnout.

Description: Professional coaching is used in the business field to promote self-reflection, emphasize individual strengths, decrease self-deprecating thoughts, and increase sense of purpose and engagement. Coaching integrates aspects of positive psychology and mindfulness. Coaching typically occurs in person or via phone. Based on examples from professional coaching programs from other fields, the authors suggest that professional coaching for physicians with burnout should occur weekly or biweekly for an hour for 6 to 12 months. The authors use a case narrative to discuss ways that coaching may be useful for common situations faced by physicians.

Contribution: This study is not an intervention study, but provides an overview of professional coaching and its potential use for physicians to combat burnout.

Cost: Unknown.

- Reilly JM and Ring JM. Healing and hopefulness: a tool for doctor wellbeing. *Med Educ* 2005;39(11):1158-9. doi: [10.1111/j.1365-2929.2005.02302.x](https://doi.org/10.1111/j.1365-2929.2005.02302.x)

Impetus: Incorporating regular positively-themed wellness sessions into the residency curriculum may improve physician wellbeing.

Description: An academic family medicine residency initiated a program entailing discussions on healing and hopefulness, called “H&H.” This conversation was purposely integrated at the conclusion of the standing morbidity and mortality conference in order to contrast the focus on negative outcomes with a focus on positive experiences. The session was facilitated by an MD and a behaviorist. Residents and faculty met together and were encouraged to share positive moments, which included themes of power as healers, the value of doctor-patient relationships, spirituality, peer support, and career affirmation. A total of 14 faculty and 15 residents completed a satisfaction survey. A majority rated the session highly as an opportunity to express gratitude, affirm good work, create a positive team environment, and nurture team building. All respondents thought that the session should be continued.

Contribution: Although conclusions from this study are limited due to the lack of a control group and lack of use of validated outcome measures, this intervention represents an early proof-of-concept of the value of incorporating positive-focused opportunities for discussion and reflection into the workday.

Cost: Unknown.

- Hershberger PJ. Prescribing happiness: positive psychology and family medicine. *Fam Med* 2005;37(9):630-4. PMID: [16193425](https://pubmed.ncbi.nlm.nih.gov/16193425/)

Impetus: Positive psychology refers to the study and development of methods to enhance and maintain happiness, which supports a better quality of life. Incorporating positive psychology into physician training may have positive effects on wellbeing.

Description: This perspective reviews several interventions within positive psychology that can be used for enhancement of the personal wellbeing of physicians and for the promotion of emotional and mental wellbeing for patients. The article provides an overview of the potential benefits of positive emotions including improved physical and mental health, longer life span, increased cognitive flexibility, creativity, and the potential for increased self-control. The paper then reviews strategies that have been studied outside of medicine, aimed at increasing gratitude (“Three Good Things”), augmenting team building (“capitalization” or sharing good news), and obtaining “good enough” outcomes (“satisficing”). The author also reviews foundational work of positive psychology on highlighting character strengths and virtues (“signature strengths”) and self-exploration and learned optimism to enrich personal wellbeing and team building among colleagues. Examples of potential applications of positive psychology for physicians are discussed.

Contribution: Although this paper does not describe interventions using these techniques within the medical profession (as none exist thus far), it provides an overview of positive psychology strategies that have been successful outside of medicine and suggestions for ways to incorporate them into medical practice.

Cost: Unknown.

Coaching / Development

Medical Students

Wald HS. Professional identity (trans)formation in medical education: reflection, relationship, resilience. *Acad Med* 2015;90:701-6. doi: [10.1097/ACM.0000000000000731](https://doi.org/10.1097/ACM.0000000000000731).

Impetus: While professional identity formation is a key goal of medical education, no clear “road map” exists to help medical educators guide the development of empathic, humanistic physicians.

Description: This commentary by a leader in reflection speaks to the intentional development of professional identity in medical students. Specifically, it investigates the role of guided reflection, use of personal narratives, relationships and role modeling. This paper describes the process of professional identity formation and explores the process of teaching active reflection, including reflection of situation, others, and self. Dr. Wald gives examples of reflective writing that can support this process. The intertwined concepts of reflection, resilience, and relationships are discussed as keys to “deliberate” development of professional identity.

Contribution: This article presents professional identity formation within a conceptual framework that can be applied to any medical training program as well as practical advice to developing humanistic values among trainees.

Cost: Unknown.

Steckler N, Young L, Ervin A. OHSU resiliency skills elective. *MedEdPORTAL Pub* 2015;11:1002. <http://doi.org/10.15766/mep.2374-8265.1002>.

Impetus: The goal of this program was to introduce students to a range of resilience skills while improving their emotional intelligence.

Description: At the Oregon Health Science University (OHSU), educators developed a Resiliency Skills Elective, administered as one 2.5 hour session per week for 8 weeks. The authors describe three foundational components that reinforce each other: resiliency practices, social support, and faculty role modeling. The curriculum uses a strength-based approach, focused on building resilience skills and support networks for students. The skills included mindfulness practices, breathing techniques, listening skills, emotional regulation skills, and positive psychology practices. The 2.5 hour sessions consisted of 30 minutes for a meal and socializing plus 2 hours of curricular exercises.

Contribution: This elective uses evidenced-based strategies to promote resilience in medical students. There is no evaluation data provided, so the impact is unknown.

Cost: Cost of the curriculum would include eight meals for the students and faculty advisor, plus printing.

Interns/Residents/Fellows

Palamara K, Kauffman C, Stone V, et al. Promoting success: a professional development coaching program for interns in medicine. *Med Educ* 2015;7(4):630-7. <http://dx.doi.org/10.4300/JGME-D-14-00791.1>

Impetus: Internship is a stressful period in both professional development of identity and knowledge. Remediation-based interventions do not address all learners' professional development. The authors instituted a positive-psychology-based coaching program for one intern class, assessing feasibility and impact on burnout.

Description: This educational innovation describes a professional development coaching program implemented at a single-institution's internal medicine internship program in 2012-13. All 72 interns participated and 26 faculty coaches were recruited and trained in the main tenets of positive psychology. Quarterly meetings between interns and coaches were expected. Faculty coaches had access to written session guides. Survey measures of program experience, professional development and professional interactions were assessed in the first and fourth quarters alongside burnout measures as per Maslach Burnout Inventory. Interns' overall assessment of the program was strongly positive, with fewer reporting high levels of emotional exhaustion in the final quarter compared to the prior year's interns (33% vs. 47%). Trainee pre- and post-survey personal accomplishment scores showed no change.

Contribution: This report constitutes the first description of a strength-based model of coaching for interns. The authors provide the program's curricular materials as an online supplement.

Cost: The residency associate program director acted as the coaching program director (CPD) with a 70-hr contribution and the program was supported by grant funding. Faculty coaches contributed nine hours per coachee (2-3 interns each) and interns participated up to 5.5 hours each.

Practicing Physicians

Dembitzer A, Wang B, Grask A, et al. Burnout in clinician-educators and the importance of lifelong learning: findings from a medical education faculty development program. *J Gen Intern Med* 2013; 28:S38. Abstract. <https://doi.org/10.1007/s11606-013-2436-y>.

Impetus: Clinician-educators (CE) often receive no formal training in education and are at high risk for burnout. The authors sought to determine if a longitudinal faculty development program (FDP) could decrease burnout or improve other job-related outcomes in CEs at one institution.

Description: Eighteen faculty for an 18-month longitudinal clinical skills course for medical students were recruited to participate in a year-long FDP requiring one hour of time per month. FDP format included small group discussions, two three-station Objective Structured Teaching Exercises (OSTE), and videotape review of both OSTEs and small-group teaching sessions. Pre- and post-program surveys of burnout (Maslach Burnout Inventory, separated by clinician vs. educator role response), career fit, job satisfaction, teaching confidence and commitment to lifelong learning (Jefferson Scale) indicated reduction below burnout threshold in one item (for 7/18 of the participants by end of FDP). Of note, baseline emotional exhaustion and depersonalization scores were higher in the clinician compared to educator role; personal accomplishment burnout was reported independent of role. At least 77% of participants reported baseline confidence in teaching, career fit and job satisfaction. CEs who scored below the depersonalization threshold following program completion showed a significant ($p<0.05$) increase in lifelong learning scores.

Contribution: This abstract demonstrates that CEs in an urban, underserved setting can demonstrate high rates of burnout despite reporting high teaching confidence, good career fit and job satisfaction. A longitudinal FDP may support a modest reduction in burnout.

Cost: Unknown.

Communication Training

Interns/Residents/Fellows

Clayton JM, Butow PN, Waters A, *et al.* Evaluation of a novel individualised communication-skills training intervention to improve doctors' confidence and skills in end-of-life communication. *Palliat Med* 2013;27:236–243. doi: [10.1177/0269216312449683](https://doi.org/10.1177/0269216312449683).

Impetus: Communication is identified by patients and families as critical to end-of-life care and poor quality of discussion about end-of-life issues is a frequent cause of complaints. Residents often feel inadequately prepared for these conversations due to lack of training. Formal communication skills training for practicing physicians has been found to be effective but often involves a multi-day time commitment, and few studies have explored workshops for residents. This study was created to pilot a brief communication training program for trainees and examine its effects on burnout, confidence, communication skills and attitudes toward psychosocial care.

Description: Twenty-two resident volunteers in Australia participated in three one-hour teaching sessions focused on end-of-life care communication. They were also provided with an additional two hours of review material. The first session provided learners with a framework and evidence-based strategies for conversations with patients expected to die within days to weeks. The following two sessions were individual sessions involving practicing communication skills with feedback from an expert facilitator. One week ahead of the first teaching session, participants completed written questionnaires covering burnout (Maslach Burnout Inventory, MBI), attitudes toward psychosocial aspects of care and confidence in communication skills. Additionally, each resident was videotaped interviewing a simulated caregiver of a terminally ill patient and an associate transcript was coded for presence/absence of communication skills and strength of observed skills. All measures were repeated at two weeks following the intervention along with assessment of learner satisfaction. Trainees indicated that the training was useful and significant improvements were found in their communication skills, confidence in communication, attitudes toward psychosocial care and sense of personal accomplishment. While there was significant improvement in the personal accomplishment domain of burnout, there were no significant changes in emotional exhaustion or depersonalization MBI subscales.

Contribution: Communication skills training can feasibly occur in a time-sensitive manner for busy trainees and improves skills, knowledge and attitudes. However, the pilot's failure to impact trainees' burnout levels in domains of emotional exhaustion and depersonalization suggests that brief communication skills training may not directly address these burnout domains, though the pilot may be underpowered to detect a difference.

Cost: Five hours of training time for participating residents.

Bragard I, Etienne A, Merckaert I, et al. Efficacy of a communication and stress management training on medical residents' self-efficacy, stress to communicate and burnout: a randomized controlled study. *J Health Psychol* 2010;15:1075–1081. doi: [10.1177/1359105310361992](https://doi.org/10.1177/1359105310361992).

Impetus: Associations between lack of self-efficacy in communication and burnout have been reported in physicians. Communication skills training can positively impact self-efficacy. Stress management skills training programs have shown limited impact on stress and burnout in health professionals, but have not been studied in conjunction with communication skills training. The authors instituted a unique program for residents and evaluated the impact of combined communication and stress management skills training.

Description: This longitudinal randomized controlled study investigated efficacy of cancer care-based communication skills training and stress management training for 96 French-speaking medical residents. Assessment of residents' self-efficacy beliefs related to communication, stress in communication with cancer patients and burnout (Maslach Burnout Inventory) were done at baseline and in follow-up. Following the assessment period, the 47 control group residents were invited to participate in the 30-hour communication skills training and 10-hour stress management training. Intervention participants reported a statistically significant increase in self-efficacy in communication and decreased stress in communication with cancer patients. The intervention did not decrease burnout.

Contribution: This is the first study to assess combination of communication skills training and stress management training in medical residents and demonstrated trainees improved self-efficacy in these areas, despite showing no effect on burnout.

Cost: Forty hours of training time for participating residents.

Practicing Physicians

Fujimori M, Shirai Y, Asai M, et al. Development and preliminary evaluation of communication skills training program for oncologists based on patient preferences for communicating bad news. *Palliat Support Care* 2014;12:379–386. doi: [10.1017/S147895151300031x](https://doi.org/10.1017/S147895151300031x).

Impetus: Patients have important opinions about how physicians can best deliver bad news. This study explored patient preferences and developed a communication skills training (CST) workshop for oncologists. The impact of this training on oncologists' confidence, helpfulness and burnout was evaluated.

Description: Patient preferences were explored related to (1) the appropriate environment for bad news discussions, (2) various approaches on how to deliver bad news, (3) important additional information to discuss and (4) how to best provide reassurance and emotional support. The 2-day CST workshop consisted of lectures, role playing with simulated patients, and group discussions with other physicians. The program evaluation used pre- and post-CST consultation with a simulated patient. The authors observed the communication preferences, behaviors, and utterances of the providers at the simulated patient encounter before and after the CST in order to evaluate confidence with news delivery. The authors also evaluated burnout (Maslach Burnout Inventory), subjective confidence, and helpfulness with pre-, post- and 3-month post-CST surveys. The authors found significant improvement in emotional support and consideration for how to deliver information after the 2-day CST intervention. They also found improvements in confidence and reduction of burnout, persistent at three months post-CST.

Contribution: Overall, the program was rated well by oncologists and had some benefit to their comfort with delivering bad news. However, this study did not evaluate the patient perspective. In future studies, the authors should explore if the patients felt the doctors improved after the workshop.

Cost: Cost was not mentioned in this study but the participating oncologists dedicated two full days for the intervention. The program also required experienced psychiatrists, psychologists, oncologists and simulated patients.

Quenot JP, Rigaud JP, Prin S, *et al.* Suffering among carers working in critical care can be reduced by an intensive communication strategy on end-of-life practices. *Intensive Care Med* 2012;38:55–61.

doi: [10.1007/s00134-011-2413-z](https://doi.org/10.1007/s00134-011-2413-z).

Impetus: Burnout can impact a variety of healthcare providers and may be especially pertinent to those who work in intensive care settings (ICUs). This study evaluated the impact of communication training regarding end-of-life practices on burnout in ICU providers.

Description: The communication intervention was developed by ICU providers with the help of two psychologists. It took place over six months and combined lectures and group work, with the aim of improving communication between providers, patients, and patients' families. The study enrolled 62 providers from an ICU setting: only 7% of those who responded were physicians, while nurses made up the majority of participants. Burnout (Maslach Burnout Inventory) and depression (Center for Epidemiologic Studies Depression Scale, CES-D) were measured pre- and post-communication training. Both burnout and depression significantly improved with the intervention.

Contribution: The authors found that the communication intervention was successful in decreasing burnout and depression among a population of intensive care providers. However, the low percentage of physicians that participated limits its generalizability. This study is better considered a study of a burnout intervention in ICU nurses.

Cost: Unknown.

Butow P, Cockburn J, Girgis A, *et al.* Increasing oncologists' skills in eliciting and responding to emotional cues: evaluation of a communication skills training program. *Psychooncology* 2008;17:209–218.

doi: [10.1002/pon.1217](https://doi.org/10.1002/pon.1217).

Impetus: While psychological morbidity is very prevalent in cancer patients, it is often undiagnosed and not treated. This study evaluated a communication skills training (CST) program that had a goal of improving provider detection and communication about mental health with patients. Furthermore, communication difficulties have been noted to be primary contributors to doctor stress and burnout.

Description: This randomized controlled trial study involved 35 oncologists randomized to receive communication training or not. The training included a 1.5-day communication skills training program that utilized DVD examples, lectures, and role-play scenarios. Burnout was measured using the Maslach Burnout Inventory before and after the program. In addition to the surveys, the authors evaluated physician behavior using pre- and post-CST simulated patient encounters.

Contribution: The authors found that the physicians in the CST displayed better behavior in patient interactions after the program with fewer blocking behaviors and more success in creating a positive environment but neither reached statistical significance. The CST program was well-received and valued by physicians, but did not reduce burnout.

Cost: Unknown.

ORGANIZATION TRANSFORMATION

Program-Level Interventions

Medical Students

Agarwal G and Lake M. Personal transition to the profession: a novel longitudinal professional development and wellness medical student curriculum. *Acad Psychiatry* 2016;40:105–108.

doi: [10.1007/s40596-015-0463-1](https://doi.org/10.1007/s40596-015-0463-1).

Impetus: Medical student wellness may be able to be specifically taught through thoughtful curriculum design and implementation.

Description: The authors describe a new 4-year professional development and wellness curriculum at Northwestern University's Feinberg School of Medicine, consisting of 17 required monthly 90-minute sessions in small groups of eight students and one faculty member from within the students' college (four colleges each have 40 students). Students prepare for each session by reviewing a learning guide and completing written exercises on a blog to stimulate reflection and narrative, then meet in small groups to process the exercise. Topics cover personal and educational goals and relationships with peers, positive psychology techniques, psychological struggles common in the profession of medicine such as perfectionism and impostor syndrome, and professional identity formation. Quantitative evaluations in the first two years included satisfaction measures by small group leaders and students (N=140). The majority of students felt more prepared to transition to medical school and more self-aware, and reported being willing to seek help if they need it. Some students were not comfortable discussing personal topics in small groups, and the facilitation of the faculty leader impacted group dynamics. The authors comment that an unintended effect of exposure to psychiatry faculty may have been to decrease stigma in seeking mental health care. There was no comparison group.

Contribution: This study is limited by its lack of measurement of validated wellbeing metrics and lack of a comparison group. The strengths of this study include its high satisfaction measures and the in depth topical curriculum that is described.

Cost: Unknown: the study did not report on costs directly, but direct and indirect costs would include preparation for monthly meetings, writing blogs, and participating in the one hour monthly meetings for all students and 20 faculty annually.

Pojednic R and Frates E. A parallel curriculum in lifestyle medicine. *Clin Teach* 2015;12:1–5.

doi: [10.1111/tct.12475](https://doi.org/10.1111/tct.12475).

Impetus: One potential reason why fewer than half of primary care doctors counsel their patients on lifestyle behaviors is the lack of structured training in medical school on lifestyle medicine.

Description: In 2009 Harvard Medical School developed a voluntary medical student lecture series on lifestyle medicine through the Lifestyle Medicine Interest Group. The curriculum is led by student with a faculty advisor and began as a Lunch and Learn format with 4-5 lectures (4-8 curricular hours) each year. Topics initially included an EBM approach to exercise, nutrition, behavior change, and evolved to incorporate motivational interviewing, positive psychology, and physician self-care skills. Lectures

included active participation in the activity being learned; for example, cooking demonstrations and exercises during the sessions. During the first year, 26 students participated; by 2013, 35 students participated annually. Survey data from 2013 (N=12, 35% response rate) revealed low baseline self-rated confidence in counseling patients for behavior change; the follow-up survey did not measure skills acquisition but qualitative comments suggested improved confidence. No evaluation data are provided regarding impact of physician self-care skills.

Contribution: Although this program has limited evaluation data, it provides a description of learning objectives for a curriculum to meet physician competencies in lifestyle medicine, and includes a model for implementation. The intervention included physician self-care skills in the lecture series, but no evaluation data were provided for this aspect of the intervention.

Cost: Author E. Frates indicated that faculty time was the greatest cost (personal communication).

Slavin SJ, Schindler DL, Chibnall JT. Medical student mental health 3.0: Improving student wellness through curricular changes. *Acad Med* 2014;89:573-77. doi: [10.1097/ACM.0000000000000166](https://doi.org/10.1097/ACM.0000000000000166).

Impetus: Although several studies have described reactive or supplemental approaches to medical student mental health, few studies have assessed curricular changes to prevent the negative psychological and emotional effects of medical school. In this article, the authors describe a program to address root causes of stress to improve mental health in medical students that was implemented at Saint Louis University School of Medicine starting in 2009–2010.

Description: Curricular changes were first instituted in the 2009-2010 school year, using person-in-context primary prevention model to proactively target contextual elements within the curriculum that could contribute to poor mental health. Changes were made based on data from 2008 indicating that 57% of students had moderate-high anxiety and 27% had moderate-severe depression; volume and level of detail of material and competition were identified as drivers and were the impetus for changes. Curricular changes included: (1) a pass/fail grading system for preclinical courses, replacing the honors/near honors/pass/fail grading system; (2) a reduction in contact hours across the first two years of curriculum by 10% and reducing unnecessary detail in courses through course-specific faculty development; (3) the institution of longitudinal electives to allow students more time to explore their interests, create mentorship relationships, and to engage in service and/or research with more continuity; and (4) the establishment of learning communities composed of students and faculty who share common interests and passions beyond the classroom. In 2010-2011, a six-hour Resilience and Mindfulness program based in positive psychology was added to the first year clinical skills course. In 2011-12 anatomy was rescheduled to later in the year and exam design was changed. Students took an annual Center for Epidemiological Studies Depression Scale, Spielberger State-Trait Anxiety Inventory, Perceived Stress Scale, and Perceived Cohesion Scale. Post-change classes, compared to the historical cohort of pre-change classes, exhibited lower rates of moderate to severe depression symptoms and a substantial decrease in mean anxiety scores, as well as a non-statistically significant decrease in the mean stress levels. Mean group cohesion and student satisfaction with the program scores were higher in the post-intervention cohorts. USMLE Step 1 scores also rose significantly for the class of 2014, compared with the previous classes that did not receive the Resilience/Mindfulness program, social events, and the reversal of anatomy and cell biology.

Contribution: This study describes a series of major curricular changes to address curricular structures that may contribute to anxiety and depression in medical students. Although the design was not randomized, the evaluation strategy used validated measurement scales and compared the intervention group to a historical cohort. Although curricular changes may be time-intensive to implement initially, this study suggests that such initiatives may have a significant effect on medical student mental health.

Cost: The authors report that the program's annual budget is less than \$10,000.

Reed DA, Shanafelt TD, Satele DW, *et al.* Relationship of pass/fail grading and curriculum structure with wellbeing among preclinical medical students: A multi-institutional study. *Acad Med* 2011;86:1367-73. doi: [10.1097/ACM.0b013e3182305d81](https://doi.org/10.1097/ACM.0b013e3182305d81).

Impetus: Student wellbeing may be affected by curriculum structure and grading scales. This study examines whether there is an association between curriculum structure, assessment strategy, and student wellbeing.

Description: The authors surveyed 2,056 first- and second-year medical students at seven U.S. medical schools in 2007. They used the Perceived Stress Scale, Maslach Burnout Inventory, and Medical Outcomes Study Short Form (SF-8) and contacted the Dean's offices for each school to obtain hours spent in didactic, clinical, and testing experiences, and grading scales, categorized as two categories (pass/fail) versus three or more categories (e.g., honors/pass/fail). 58% (1,192) of 2,056 students responded. Students in schools using grading scales with three or more categories had higher levels of stress, emotional exhaustion, and depersonalization, were more likely to have burnout and more likely to have considered dropping out of school compared with students in schools using pass/fail systems. There was a statistically significant association between time spent in testing and perceived stress and low QOL. There was no association between contact hours in didactic and clinical experiences and wellbeing.

Contribution: This cross-sectional study showed that the grading scale was more strongly correlated with student wellbeing than any other aspects of the curriculum structure. Although it does not measure data from before and after implementing changes to pass-fail grading policies, this study implies that curriculum reforms aimed at promoting wellbeing should include attention to grading strategies.

Cost: Unknown.

Drolet BC and Rodgers S. A comprehensive medical student wellness program- Design and implementation at Vanderbilt School of Medicine. *Acad Med* 2010;85:103-10. doi: [10.1097/ACM.0b013e3181c46963](https://doi.org/10.1097/ACM.0b013e3181c46963).

Impetus: Research suggests that student burnout and mental illness are increasing in U.S. medical schools. In response, students and administrators developed the Vanderbilt Medical Student (VMS) Wellness Program to promote student health and wellbeing through coordination of many new and existing resources.

Description: The VMS Wellness Program began in the fall of 2005 through the creation of a Student Wellness Committee (SWC) to address student leadership around the six pillars of wellness from the National Wellness Institute: intellectual, environmental, physical, interpersonal, emotional, and spiritual.

Students and the Dean of Student Affairs identified general stress points in medical students' lives, focusing on three core principles: mentoring and advising, student leadership, and personal growth. From these core principles, three components of the program emerged: the Advisory College consisting of faculty advisors with protected time, the SWC, and VMS LIVE, a longitudinal workshop-based curriculum to address personal growth and professional identity with specific goals for each year of training. They also organized an annual "Olympic-style" College Cup including both athletic and non-athletic competition which was positively received by students as an outlet for non-medical activities and forming connections with fellow students and faculty.

Contribution: The VMS Wellness Program is the first published model of a comprehensive medical student wellness initiative. The development and design of the program described in this article may serve as a framework for other institutions. Anecdotal evidence suggests that the program is well-received by Vanderbilt's medical students; however, evaluation data is not provided in this description.

Cost: Unknown.

Curriculum handbook for VMS Wellness Program: Zackoff M, Sastre E, Rodgers S. Vanderbilt wellness program: model and implementation guide. MedEdPORTAL Publications. 2012;8:9111.

http://doi.org/10.15766/mep_2374-8265.9111.

Hassed C, de Lisle S, Sullivan G, Pier C. Enhancing the health of medical students: outcomes of an integrated mindfulness and lifestyle program. *Adv Health Sci Educ Theory Pract* 2009;14:387-98. <http://dx.doi.org/ucsf.idm.oclc.org/10.1007/s10459-008-9125-3>.

Impetus: Poor mental health during medical training has been linked to poor personal health behaviors and burnout later in professional careers, as well as lower quality of care indicators, such as prescribing errors. This article explores a wellness curriculum at a medical school aimed at reducing burnout and increasing emotional intelligence through mindfulness-based self-care.

Description: Monash University in Australia developed its Health Enhancement Program (HEP) for their first year medical students in 2002, implemented during the second half of the first semester for the 315 medical students in each class. The curriculum includes mindfulness and mind-body techniques and the "ESSENCE" model for a healthy lifestyle (including of education, stress management, spirituality, exercise, nutrition, connectedness, and environment). The eight core lectures are supplemented by six 2-hour tutorials and self-directed learning. Students keep a journal and meet regularly with a tutor and in small groups. These elements are integrated into other elements of the core curriculum through lecture series, case-based learning, and assessment integrated into assessment of other components of the curriculum and the OSCE. Overall, the HEP curriculum is a significant portion of the first year curriculum, accounting for 10% of the total assessment load. Data before and after the intervention were available for 148 (55%) of students. 90% reported applying mindfulness practice, and there were statistically significant improvements in the depression, hostility, and General Severity Index of the Symptom Checklist-90, and in the psychological domain of the World Health Organization Quality of Life scale.

Contribution: This intervention is one of the longest-standing wellness curricula to be integrated into a core curriculum of a medical school, and although limited by its non-randomized design, demonstrated improvements in wellbeing measures before and after intervention. The assessment strategies are also

integrated into the overall medical school assessments in order to avoid marginalizing the wellness curriculum.

Cost: Unknown.

Rohe DE, Barrier PA, Clark DA, et al. The benefits of pass-fail grading on stress, mood, and group cohesion in medical students. *Mayo Clin Proc* 2006;81(11):1443-1448.

doi: [10.4065/81.11.1443](https://doi.org/10.4065/81.11.1443)

Impetus: Traditional 5-level, A through F, grading systems may promote competitiveness and anxiety, so many medical schools have moved to a pass-fail grading system in the preclinical years. Whether a pass-fail system promotes more cooperativeness and reduces stress in medical students, and whether it has an impact beyond the first year, is unclear.

Description: The Mayo Medical School in Rochester, MN moved to a pass/marginal pass/fail grading system for the first year only (followed by the traditional 5-level grading system retained in the second year) for the class of 2006. The authors prospectively studied students in the class of 2005 (both first and second year 5-level grading) compared to the class of 2006 (first year pass fail, second year 5-level grading) at the end of each group's first and again second year of medical school. They used well- validated self-reported tools for their primary outcomes of interest: Perceived Stress Scale, Profile of Mood States, Perceived Cohesion, Scale, and Test Attitude Inventory. The class of 2006 (pass-fail group) reported less stress and more group cohesion at the end of their first and second years than the (5-level graded) class of 2005, with a non-significant trend towards better mood in the class of 2006 and no difference in USMLE step 1 scores or test-taking anxiety.

Contribution: This study shows an association between the pass-fail system and lower levels of stress and greater perceived class cohesion, a benefit that persisted into the end of the second year of medical school. Because the study was non-randomized and baseline data were not collected prior to the start of the curricular change, it is unknown whether the groups were different at the beginning of medical school in these areas, and longer-term outcomes remain to be seen. This study offers a compelling case for the pass-fail grading system as a means to reduce student competition and stress.

Cost: Unknown.

Interns/Residents/Fellows

Bird A and Pincavage A. A curriculum to foster resident resilience. *MedEdPORTAL Pub* 2016;12:10439.

<http://doi.org/10.15766/mep.2374-8265.10439>.

Impetus: Burnout is highly prevalent in medical trainees, and is associated with depression, suicide, and poor clinical performance. A program to build resilience skills may improve wellbeing.

Description: A curriculum was developed to teach skills to help cultivate resilience and promote wellness. The series was delivered to 36 interns in 2014-2015 at the University of Chicago (participation rate: 85.7%), and included content related to setting realistic expectations, coping with medical errors, and gratitude. The workshop series included three 60-minute small group (10-12 participants) sessions delivered during the residency program's outpatient block lecture time, and was facilitated by a core member of the residency

program, including chief resident, core faculty, or associate program directors. Cases in skill building exercises were based on clinical events reported by trainees during the small group sessions. Participants found sessions to be valuable, with most interns encouraging the sessions to continue in the next academic year (69%). Specifically, they valued the open forum for reflection and discussing setbacks with colleagues and felt that it improved their comfort in discussing burnout and medical errors.

Contribution: A strength of the curriculum is its implementation within the residency program infrastructure, without requiring additional funding. The MedEdPortal toolkit may be a useful resource for other programs and includes a facilitator's guide, skill building exercise, and a resilience pocket card. Limitations of this curriculum are its lack of a comparator group, and that validated outcome measures of wellbeing are not reported.

Cost: Per personal communication with author (A. Pincavage), cost of developing the curriculum was mostly faculty time.

Brennan J and McGrady A. Designing and implementing a resiliency program for family medicine residents. *Int J Psychiatry Med* 2015;50(1):104-14. doi: [10.1177/0091217415592369](https://doi.org/10.1177/0091217415592369).

Impetus: Few studies have focused on interventions that promote resilience during residency training. The authors present a comprehensive program that incorporated both a longitudinal curriculum to teach individual-based resilience strategies, as well as program-level changes for improved community wellbeing.

Description: The program was developed at the University of Toledo Family Medicine Residency Program, a community program with 12 residents (mostly international medical graduates) that serves a suburban population. A needs assessment done prior to curriculum development ascertained residents' individual needs (increase self-awareness, learn stress management skills, improve their health behavior and learn better time management) as well as system-level needs (increased support and community-building social activities, adjusting rotation schedules to reduce stress, a team approach to problem solving, and increased resources for wellness-related activities). The curriculum included a longitudinal series of interactive and experiential sessions that addressed the above needs; positive psychology and mindfulness-based strategies were utilized in each session. Attendance was required; however, the authors note that residents did miss sessions due to rotations, vacations, and sickness. System-level changes included several unique ideas: daily 1-2 minute mindfulness meditation prior to inpatient rounds and prior to resident report/conferences, placing an elliptical machine in the call room, providing fruits and vegetables, and hosting a healthy cooking session lead by a chef and registered dietician. Additionally, residents were asked to fill out a "Health Risk Assessment" every 12 months which focused on the self-care element of resilience. Using this tool, residents were able to track their comprehensive wellness score and set longitudinal goals for improvement. Peer health coaches were utilized for additional self-care support and encouragement. The authors report that their intervention is being compared to a control group at another residency program, with baseline assessment of the Maslach Burnout Inventory, Connor-Davidson Resilience Scale, and Professional Quality of Life Scale; however, post intervention data are not presented. Evaluation data demonstrated high acceptance of the program, increased healthy food consumption and exercise, and decreased reactivity to stress.

Contribution: This paper reports an approach to successful resident engagement in programmatic and individual health-oriented change. Many novel ideas are presented that could be utilized by other residency programs. Although the authors report that another program serves as a comparison group, in this paper, only satisfaction measures are reported; follow-up data on wellbeing outcomes using validated scales will be useful to understand the impact of this intervention.

Cost: The project was supported by an Academy of Educators Grant at the University of Toledo Medical Center. Inferred cost would include time protected for curriculum session facilitators and for the gym equipment and fresh fruits and vegetables provided for residents.

Salles A, Nandagopal K, Walton G. **Belonging: a simple, brief intervention decreases burnout.** *J Am Coll Surg* 2013;217:S116. <http://dx.doi.org/10.1016/j.jamcollsurg.2013.07.267>.

Impetus: Attrition of residents is a significant problem facing general surgery residencies, with approximately one in five general surgery residents leaving for another field. Data from interventions to decrease attrition and mitigate contributing factors are lacking. This paper investigates whether an intervention to improve residents' sense of belonging decreases attrition.

Description: Junior residents from seven surgical specialties took a baseline survey of attitudes and beliefs, and were then randomized into either a belonging treatment or control condition. The intervention group spent 15-20 minutes reading anecdotes from senior residents describing challenging early residency experiences, while the control group read descriptions of challenging ethical dilemmas. Attitudes and beliefs were surveyed as a proxy for likelihood of leaving residency, and burnout was measured using the Maslach Burnout Inventory. Residents reporting feelings of belonging were more likely to report feeling they would complete residency ($P<0.01$). Mean scores for burnout items on the MBI post-intervention were lower in the intervention arm compared to the control arm ($P<0.05$), driven by decrease in emotional exhaustion, without significant change in depersonalization or accomplishment (personal communication with author A. Salles).

Contribution: There are relatively few interventions in the literature that are incorporated into surgical programs, so this intervention provides a valuable addition. Despite the simplicity of this intervention, it showed a significant impact on emotional exhaustion; however, the duration of this effect is unclear. This study suggests that personal anecdotes from senior residents can mitigate burnout and self-reported attitudes that may correlate with attrition from residency. The actual attrition rate for resident participants was not measurable during this follow-up period, and will be useful to understand the impact of this intervention on the outcome of attrition.

Cost: Unknown.

Dabrow S, Russell S, Ackley K, *et al.* **Combating the stress of residency: one school's approach.** *Acad Med* 2006;81:436-439. doi: [10.1097/01.ACM.0000222261.47643.d2](https://doi.org/10.1097/01.ACM.0000222261.47643.d2).

Impetus: Resident assistance or wellness programs may help residents cope with personal and professional stressors that arise in residency. This paper describes the eight-year history of the University of South Florida College of Medicine Resident Assistance Program (RAP).

Description: The University of South Florida (USF) College of Medicine developed their USF Residency Assistance Program (RAP) in 1997, deliberately integrating it into GME training, and collected data on the program over eight years. The USF RAP was modeled after business employee assistance program but tailored to accommodate identified requirements for residency programs: it is broad-based, readily available, easily accessible, confidential and off-site. The RAP is firewalled from individual residencies, with confidentiality broken only in extreme circumstances such as suspected criminality. Each resident can receive up to three visits at no cost, with additional visits on a case-by-case basis. Services are provided primarily by psychologists and include counseling and referral services for residents and families; assistance is available 24 hours/day for urgent needs. Over 8 years, an average of 24 residents/year used the program (4.7%). Emotional difficulties were most common (52%), followed by marital problems (15%) and financial or legal problems (6.7% each). These frequencies were similar to those seen in business employee wellness program. In 2004 and 2005, 96.6% and 92% of residents, respectively, reported being aware of the RAP's existence (51% and 53% response rates). Although no formal outcomes data were measured, anecdotal experience indicates high acceptance.

Contribution: Given the scope of the intervention, the cost associated with its implementation is relatively low. Although limited by lack of specific wellbeing outcome measures, the program is widely known and has high acceptance as a resident resource.

Cost: Seven cents per resident per day, or a total of \$15,000 per year to cover 580 residents.

Holmes AV, Socolar RR, Cull WL. Part-time residency in pediatrics: description of current practice. *Pediatr* 2005;116(1):32-7. doi: [10.1542/peds.2005-0127](https://doi.org/10.1542/peds.2005-0127).

Impetus: Part-time residency training may provide flexibility for residents, which may have implications for wellbeing. This study describes the prevalence and structure of part time training options in pediatrics residency programs.

Description: This study surveyed 190 accredited pediatrics programs in 2003; 156 (83%) responded. 12% of programs had one or more part time resident from 2000-2003 (0.7% of all residents represented in the survey). Salaries were prorated in all programs, and most continued benefits and had a reduced call schedule. Child care was the most commonly cited reason for opting for part-time residency (67%). Part-time training extended residency by an average of 15 months. The authors also report that 24% of pediatrics programs advertise the option of part-time residency in the AMA Fellowship and Residency Interactive Electronic Database.

Contribution: This descriptive study provides an overview of the prevalence of and reasons for part-time residency training in pediatrics, as well as the impacts on benefits and length of training. Further studies are needed to determine whether part-time training improves resident wellbeing.

Cost: Unknown.

Schaff, EA and Hoekelman RA. Reduced-schedule pediatric residency training. *J Med Ed* 1984;59(10):815-24. PMID: [6481778](https://pubmed.ncbi.nlm.nih.gov/6481778/)

Impetus: Authors from the University of Rochester described outcomes in a small number of pediatric residents who chose an extended residency training schedule which included block time away from work.

Description: This paper describes reduced-schedule training for 15 pediatric residents at the University of Rochester between 1977 and 1982. Overall, 13% of 114 trainees who entered residency during that period chose schedules that included block time away from work. These schedules were arranged *a priori* so that they did not have a negative impact on the total residency FTE, and therefore did not negatively affect residents who had full-time schedules. Data were collected on resident satisfaction with reduced schedules, difficulties encountered, patient care and educational outcomes and financial consequences. While some residents in reduced schedules did experience financial stress because of lower income during off blocks, and others had concerns about the increased length of time required to complete training, most residents felt that it improved their energy and enthusiasm for work, improved their professional self-confidence, and allowed them to focus more clearly on career goals. All residents would recommend this option to other residents who were considering it. Faculty were also surveyed, with a 92% response rate, and most felt reduced-schedule residents performed as well or better clinically than their regular schedule colleagues, with no negative effects on patient care or educational quality.

Contribution: This article suggests extending pediatric training to facilitate intermittent block time away from work was feasible, did not have negative educational or patient care consequences and was overall positively viewed by residents, although validated measures of wellbeing were not obtained.

Cost: University of Rochester authors commented that with advanced program-level planning, the reduced schedule option did not add any appreciable financial burden to the program.

System-Level Interventions

Swensen S, Kabacene A, Shanafelt T. Physician-organization collaboration reduces physician burnout and promotes engagement: the Mayo Clinic experience. *J Healthc Manag* 2016;61:105–127. PMID: 27111930.

Impetus: Organization-wide models for increasing physician engagement and decreasing burnout have promise as sustainable, long term solutions to help establish constructive organization-physician relationships and develop physician leaders. The development of these relationships is critical to organization success, however little research is present to explain how to cultivate these relationships or their impact on physician burnout. This article describes the development and implementation of the “Listen-Act-Develop” model at the Mayo Clinic as an integrated strategy to reduce burnout through physician engagement in organizational mission.

Description: The authors of this article hypothesize that combating burnout involves both mitigating the structural and functional drivers of burnout, as well as bolstering individual resiliency. This article presents a case study of the Mayo Clinic and the development of the “Listen-Act-Develop” model to reduce burnout and increase physician engagement. The authors argue that higher levels of physician engagement are associated with positive outcomes such as improved team interactions, citizenship, and performance. They propose the “Listen-Act-Develop” model, which is based on organizational psychology and social science, with integration from institutional efforts related to quality improvement, safety culture, burnout-engagement and leadership development. The authors identified key needs of physicians, including choice, a sense of camaraderie, and the need for excellence at work. Specific tools that were used to measure outcomes were not provided. Institutional and program outcomes were referenced throughout the paper. Some of the metrics were validated tools, others were developed to assess the program(s) based on needs/extensive literature review.

Contribution: The model presented in this article demonstrates how an organizational wide approach that integrates multiple strategies/initiatives has been implemented at an institution. The model presented is very well thought out, and includes an extensive literature review. However, further research is required to fully understand how generalizable the model is to other institutions and how effective the model really is in reducing physician burnout and increasing job satisfaction.

Cost: Unknown.

Shanafelt T, Gorringer G, Menaker R, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc* 2015;90(4):432-440. doi: [10.1016/j.mayocp.2015.01.012](https://doi.org/10.1016/j.mayocp.2015.01.012).

Impetus: There is little in the literature that links satisfaction with one's supervisor to overall physician job satisfaction or burnout. This study aimed to examine the relationship between supervisor leadership skills and physician/scientist burnout.

Description: This large survey-based study examined the link between leadership scores of supervisors and burnout/job satisfaction of physicians and scientists who worked under them. Nearly 3900 physicians and scientists from the three academic centers and 70 sites of the Mayo Clinic Health system were sent a survey in October 2013 that included demographic questions, burnout (Maslach Burnout Inventory) and a novel 12-dimension leadership scoring instrument. 72.7% of eligible participants responded to the survey and multivariable analysis was performed. For each 1-point increase in composite leadership score, there was a 3.3% decline in burnout and a 9% increase in the likelihood of job satisfaction.

Contribution: This study provides an important contribution to the literature on system-level interventions to improve physician/scientist wellbeing, as it is one of the first to demonstrate the suspected link between supervisor characteristics and job satisfaction. Higher quality leadership was associated with decreased burnout and increased job satisfaction among physicians being supervised. This finding may be useful to senior leadership (e.g. CEOs, CMOs, Deans, Department Chairs, etc.) when considering who to hire for high-level leadership positions, and should also prompt internal evaluation of leadership abilities to assess competence.

Cost: Unknown.

Linzer M, Poplau S, Grossman E, et al. A cluster randomized trial of interventions to improve work conditions and clinician burnout in primary care: results from the Health Work Place (HWP) Study. *J Gen Intern Med* 2015;30:1105–1111. doi: [10.1007/s11606-015-3235-4](https://doi.org/10.1007/s11606-015-3235-4).

Impetus: Burnout is prevalent in primary care physicians and is often associated with the work environment. However, there are few studies which have examined the impact of workplace interventions on physician wellbeing and those that have are limited to single centers.

Description: This cluster randomized trial evaluated 166 primary care physicians who were recruited from 34 Midwest and New York City practices and represented a mix of urban, rural, and suburban environments at academic and non-academic centers. Interventions were grouped into three categories: (1) improving communication; (2) changes in workflow; and (3) quality improvement (QI) projects addressing clinician concerns. An office work life survey that evaluated time pressure, work chaos, and workplace control was

completed before and after the intervention. Physician burnout (modified MBI), satisfaction, and intention to leave were also evaluated. The study used tools adapted from the Physician Worklife (PWS) and Minimizing Error, Maximizing Outcome (MEMO) studies to measure outcomes at baseline and at 12-18 months. Response rate was 81.3% (135/166). Significantly more physicians who participated in the intervention had improved burnout and satisfaction. Lower burnout scores were specifically associated with workflow interventions and targeted QI projects, while improved satisfaction was associated with improved communication and workflow. Data was presented in aggregate and did not specify whether there were differences in outcomes comparing environments (e.g. urban vs. rural; academic vs. non-academic).

Contribution: This study demonstrates that innovation and attention to improved work conditions can have an impact on physician wellbeing. The major limitations of this study include the heterogeneity of the sampled practices and variation in intervention implementation.

Cost: The project was supported by a grant from the Agency for Healthcare Research and Quality (AHRQ).

Ripp JA, Bellini L, Fallar R, et al. The impact of duty-hours restrictions on job burnout in IM residents: a three-institution comparison study. *Acad Med* 2015;90:494–499. doi: [10.1097/ACM.0000000000000641](https://doi.org/10.1097/ACM.0000000000000641).

Impetus: The 2011 duty hours reforms were implemented with an aim of decreasing medical errors due to work-related fatigue. Although fatigue from excessive workload is thought to contribute to burnout, especially to emotional exhaustion, the extent to which duty hours restrictions affect burnout in residents was unclear.

Description: In the study, first year residents at three large academic internal medicine programs (Mount Sinai, University of Pennsylvania, and Massachusetts General Hospital) were surveyed in 2008-2009 and in 2011-12 using the Maslach Burnout Inventory and Epworth Sleepiness Scale, allowing comparison of intern cohorts before and after implementation of 2011 duty hours reforms. Burnout was defined as meeting high sub-score threshold for either emotional exhaustion or depersonalization. For each intern cohort, burnout was measured in June prior to the start of the academic year and between April and June at the end of the intern year. The completion rate for the initial and follow-up survey was 62% (N=111) in the 2008-2009 cohort and 68% in the 2011-12 cohort (N=128). There was no significant difference for the 3-site cohort between 2008-2009 and 2011-2012 in end-of-year burnout prevalence (84% vs. 75%), or incidence (81% vs 68%), and no difference within sites. Residents who reported caring for >8 patients on a service had higher incident burnout in 2011-2012 as compared to 2008-2009. No significant difference in end of the year excessive sleepiness scores was found.

Contribution: This study's strengths include its multi-site cohort design before and after duty hours reforms were enacted. Although the design could be vulnerable to confounding due to use of a historical control cohort, rather than a randomized design, this study provides useful data to suggest that duty hours restrictions do not improve burnout or excessive sleepiness, confirms ongoing high prevalence of burnout in interns, and suggests that increased work compression under duty hours restrictions may be associated with incident burnout.

Cost: Unknown.

Parshuram CS, Amaral AC, Ferguson ND, *et al.* Patient safety, resident wellbeing and continuity of care with different resident duty schedules in the intensive care unit: a randomized trial. *CMAJ* 2015;187(5):321-329. doi: [10.1503/cmaj.140752](https://doi.org/10.1503/cmaj.140752).

Impetus: High-quality data to guide intensive care unit (ICU) scheduling decisions are limited. This study evaluated the impact of three resident ICU schedules on patient safety, resident wellbeing, and continuity of care.

Description: A randomized trial was performed on the in-house overnight schedules in 2 university-affiliated ICUs. Within 2-month long rotation blocks, residents were randomly assigned to overnight schedules of 24, 16, or 12 hours. Primary patient outcome measures were adverse events. Secondary patient outcome measures were preventable adverse events, death in the ICU, and severity of adverse events. Assessed outcomes were fatigue (Stanford Sleepiness Scale), burnout (Maslach Burnout Inventory) and somatic symptoms. Data from 47 residents (96% of sample), 971 admissions, 5894 patient-days and 452 staff surveys were analyzed. Residents reported more somatic symptoms with the 24-hour schedule ($p=0.04$); however, sleepiness and burnout did not differ in the three groups. Patient outcomes including adverse events, mortality and continuity of care were similar across the three schedules. However, this study was underpowered suggesting that significant effects might have been missed. Adherence to schedules was not monitored, which may have impacted the outcomes.

Contribution: The authors conclude that the findings do not support the alleged advantages of shorter duty schedules. However, a key finding is that is not adequately emphasized is that short duty schedules did not compromise patient safety and continuity of care while at the same time were associated with less physical symptoms in residents.

Cost: Unknown.

West CP, Dyrbye LN, Rabatin JT, *et al.* Intervention to promote physician wellbeing, job satisfaction, and professionalism: a randomized clinical trial. *JAMA Intern Med.* 2014;174(4):527-533. doi: [10.1001/jamainternmed.2013.14387](https://doi.org/10.1001/jamainternmed.2013.14387).

Impetus: Physician burnout is a well-recognized problem, but most intervention studies focused on individual-level strategies such as mindfulness, which put the onus on the physician to make time to engage in a self-care activity. The goal of this study was to evaluate the impact of participation in facilitated support group sessions, for which the time was protected by the employer. Thus, this study is both an organizational-level intervention as well as a small-group intervention.

Description: A total of 74 academic Internal Medicine physicians were randomized to participate in a facilitated small group session or unstructured protected time. All participants received one hour of protected time every other week. Outcome measures included the Physician Job Satisfaction Scale, the Empowerment at Work Scale, the Medical Outcomes Study Short-Form Health Survey (which measures mental and physical health), the Maslach Burnout Inventory, the Perceived Stress Scale, the 2-item PRIMEMD (which screens for depression) and the Jefferson Scale of Physician Empathy. Quality of life and fatigue were measured by a single-item linear analog scale. In addition to study participants, 350 physicians not participating in the intervention were also surveyed in the same interval. The intervention group showed significant improvement in empowerment and engagement at work. Rates of high

depersonalization also decreased. The proportion of participants strongly agreeing that their work was meaningful also increased whereas the proportion decreased in the control and non-study cohorts, a finding that was statistically significant. These changes were evident by three months after the study and persisted at 12 months. There were no statistically significant changes in stress, symptoms of depression, quality of life or job satisfaction among the intervention group, control group and non-participants. Interestingly, rates of depersonalization, emotional exhaustion, and overall burnout decreased substantially in the trial intervention arm, decreased slightly in the trial control arm, and increased in the non-participants, all of which were statistically significant findings.

Contribution: This study is the first randomized trial evaluating an initiative with employer-provided protected time. Additionally, it showed that participation in a structured small group intervention format had a meaningful impact on several physician wellbeing measures.

Cost: The system supported one hour of paid time every other week (equal to 0.9% full-time equivalent).

Lucas BP, Trick WE, Evans AT, *et al.* Effects of 2- vs 4-week attending physician inpatient rotations on unplanned patient revisits, evaluations by trainees, and attending physician burnout: a randomized trial. *JAMA* 2012;308:2199–2207. doi: [10.1001/jama.2012.36522](https://doi.org/10.1001/jama.2012.36522).

Impetus: Limited data exist on the effect of duration of internal medicine attending physician ward rotations as it relates to a variety of measures, including patient outcomes, learner ratings of attending physicians, and physician wellness.

Description: This cluster, randomized, non-inferiority study examined the impact of varying service rotation length (two vs. four weeks) on patient outcomes (unplanned revisit rates and length of stay), resident and medical student evaluations, and attending physician self-reported burnout. The study randomized attending physicians to a 2- or 4-week rotation on an internal medicine inpatient service at a single, public teaching hospital for one year. While there was no impact on patient length of stay and 30-day readmissions, there was a decrease in trainee perception of attendings' ability to adequately evaluate their team when on a 2-week rotation (vs. 4-week). The attending randomized to a 2-week rotation had lower burnout scores, as measured by the Emotional Exhaustion domain of the Maslach Burnout Inventory and other scales.

Contribution: Though this was a single-center study limited to an academic medical center, it is an important addition to the literature examining the impact of work-intensity on attending physician wellbeing beyond looking strictly at work hours. It generates a number of suggestions for future study, including the conduct of a similar intervention in trainees and consideration for optimal rotation length in relation to wellbeing, teaching and learning.

Cost: Support for this study was provided by a philanthropic gift from the Foglia Family Foundation.

Ali NA, Hammersley J, Hoffmann SP, *et al.* Continuity of care in intensive care units: a cluster randomized trial of intensivist staffing. *Am J Respir Crit Care Med* 2011;184(7):803-808.

doi: [10.1164/rccm.201103-0555OC](https://doi.org/10.1164/rccm.201103-0555OC).

Impetus: Little is known about the consequences of intensivists' work schedules or continuity of care. This study assessed two alternate intensivist staffing schedules to determine whether outcomes for patients and intensivists differed between these staffing schedules. This study evaluated the impact of weekend respite for intensivists, with consequent reduction in continuity of care, on them and their patients.

Description: A prospective, cluster-randomized, alternating trial of two intensivist staffing schedules was undertaken in five medical intensive care units (ICUs) in four academic hospitals. Daily coverage by a single intensivist in half-month rotations (continuous schedule) was compared with weekday coverage by a single intensivist, with weekend cross-coverage by colleagues (interrupted schedule). A total of 45 intensivists and 1,900 patients participated in the study. The impact of the intervention was measured on intensivist outcomes such as burnout, work home life imbalance, and job distress and patient outcomes including ICU length of stay, hospital length of stay and mortality. Intensivists experienced significantly higher burnout, work home life imbalance, and job distress working under the continuous schedule. ICU and hospital length of stay and mortality for patients did not differ significantly between the two work schedules. Continuity of care was significantly higher in the continuous work schedule.

Contribution: This study suggests that work schedules where intensivists receive weekend breaks improved the wellbeing of physicians without worsening patient outcomes. The authors suggest that this information can assist and inform intensivists, hospital administrators, and policy makers in choosing a model for intensivist staffing. There are two key potential limiting factors of the study: inadequate patient sample size and generalizability to ICUs that are not staffed with trainees and multidisciplinary teams that make up for lack of continuity of attending presence on weekends.

Cost: Unknown.

Dunn PM, Arnetz BB, Christensen JF, Homer L. Meeting the imperative to improve physician wellbeing. *J Gen Intern Med* 2007;22(11):1544-52. doi: [10.1007/s11606-007-0363-5](https://doi.org/10.1007/s11606-007-0363-5).

Impetus: Physicians are put under increasing pressure to effectively and efficiently treat patients, resulting in increased burnout, stress, and job dissatisfaction. Physician burnout is associated with increased medical errors and patient dissatisfaction. Due to this correlation between physician wellbeing and performance, practice-level interventions designed to improve physician and organizational wellbeing are critical.

Description: The goal of this intervention was to improve individual physician wellbeing in single, small primary care practice from 2000-2005. The 3-pronged intervention included (1) practice leadership attention to the value of physician wellbeing, (2) identification of factors impacting wellbeing (i.e. control, order, meaning) and plans for improvement with accountability, and (3) regular measurement of wellbeing markers. Surveys were distributed annually and measured physician satisfaction (an unvalidated satisfaction survey by the American College of Physicians/American Society of Internal Medicine), burnout (Maslach Burnout Inventory), work environment quality (Quality Work Competence (QWC) Survey) and physician turnover. Physician satisfaction did not change significantly. However, emotional and work-related exhaustion of individual physicians and measures of organizational-health both significantly improved over the course of the intervention.

Contribution: Limitations of this study included its small sample size and the use of one unvalidated measure. However, this study provides a helpful framework for simple workplace interventions that can have an impact on physician wellbeing, particularly those that focus on control and meaning and leadership attention to physician wellbeing.

Cost: Unknown.

Culture Change

Cohen-Katz J, Sternlieb JL, Hansen SE, Dostal JA. Developing emotional intelligence in the clinical learning environment: A case study in cultural transformation. *JGME* 2016;8(5):692–698.

doi: [10.4300/JGME-D-15-00548.1](https://doi.org/10.4300/JGME-D-15-00548.1).

Impetus: Although cultural transformation is thought to be an important element of wellbeing programs, the effect of implementing programs targeting culture change on resident wellbeing is unknown. This paper aimed to understand the impact of curricular changes to transform the educational environment and promote a culture of resident wellbeing through a mixed-methods approach.

Description: This paper describes a pilot study of a curriculum implemented in the Lehigh Valley Health Network Family Medicine Residency Program anchored on the concept of an emotionally intelligent learning community. That framework aimed to cultivate wellness through provision of time and space for self-care/reflection; safety through promoting vulnerability, asking for help, and admitting mistakes without fear of retribution; and development of interpersonal skills. Investigators used a mixed-methods evaluation strategy to examine data from 34 residents who were enrolled in the pilot program from 2007-2012. The measurements included the Fordyce Emotions Scale, Satisfaction with Life Scale, the Arizona Integrative Outcomes Scale, analysis of transcripts of “closing ritual statements” from resident assessment meetings, and analysis of transcripts from resident focus groups. Although quantitative measures of wellbeing did not change, themes from the qualitative analysis highlighted the positive culture and experiences with emotional awareness, self-care and reflection. The authors suggest that their results reflect that the intervention did not change the nature of the work, but rather normalized challenges of professional identity development. The authors hypothesize that existing psychometric tools may not be sensitive enough to capture valuable contributions from such interventions.

Contribution: This study suggests potential usefulness of programs that normalize difficulties of professional identity development, and raises the important question of whether or not these programs should be mandatory. Although this study did not have a randomized design and may not be generalizable as a single-site study of a small number of residents, this study illustrates the value of rigorous qualitative evaluation to understand the impact of wellbeing interventions. The survey measures used in this study are not commonly used in current wellbeing research, and because burnout was not measured, we do not have an understanding of whether this program had an impact on burnout.

Cost: Unknown.

Salyers MP, Bonfils KA, Luther L, et al. The relationship between professional burnout and quality and safety in health-care: a meta-analysis. *J Gen Intern Med* 2016;32(4):475-82. doi: [10.1007/s11606-016-3886-9](https://doi.org/10.1007/s11606-016-3886-9).

Impetus: Provider burnout has been associated with increased medical and surgical errors and decreased patient satisfaction, however the consistency and magnitude of the relationship between burnout and health-care quality and safety has not been systematically, studied across disciplines.

Description: This publication is a meta-analysis of 82 published and unpublished, predominantly cross-sectional studies involving 210,669 health-care providers from 33 countries and multiple disciplines, across inpatient and outpatient settings. Studies were included if empirical data was used to quantify the relationship between burnout, quality and safety. Statistically significant negative relationships between burnout, care quality and safety were identified, with small to medium effect sizes. Greater provider burnout was associated with lower perceived care quality, reduced patient satisfaction, reduced quality indicators and reduced perceptions of safety. Potential moderators of the burnout-quality relationship were explored, including dimension of burnout, quality data source and unit of analysis (from individual provider to hospital/organization). Effect sizes were significantly stronger for individuals compared to larger service units, for emotional exhaustion compared to other dimensions of burnout, and whether providers were the quality data source. Potential moderators of the burnout-safety relationship were also explored, including safety indicator type, discipline (physician, nurse or interdisciplinary sample) and country. Effect sizes were stronger for nurses compared to doctors, and when providers were the safety data source. The potential impact of study rigor, outliers and publication bias was also assessed.

Contribution: This is the first study to systematically and quantitatively analyze the relationship between health-care provider burnout and health-care quality and safety across disciplines and countries. Provider burnout accounted for approximately 7% of the variance in perceived quality and 5% of the variance in perceived safety of care. These relationships were robust to potential publication bias and ratings of study rigor, and highlight the consequences of burnout on the healthcare system at large.

Cost: Unknown.

Eckleberry-Hunt J, Van Dyke A, Lick D, Tucciarone J. Changing the conversation from burnout to wellness: Physician wellbeing in residency training programs. *J Grad Med Ed* 2009;1(2):225-30.

doi: [10.4300/JGME-D-09-00026.1](https://doi.org/10.4300/JGME-D-09-00026.1).

Impetus: When this paper was written, few interventions to support wellbeing in residency had been described in the literature. This paper seeks to define a holistic definition of wellness and provide a toolbox to create a culture of wellness in residency.

Description: This paper is a retrospective description of the development of a wellness program to promote “cultural change” in the Troy Family Medicine Residency, a community-based, university-affiliated family medicine residency program with 22 residents. They outline a “Wellness Toolbox” that includes ingredients for changing residency culture to be in support of wellness, as opposed to simply “preventing burnout.” The Toolbox emphasizes the importance of having a faculty “wellness champion” with protected time to develop a wellbeing curriculum, measure burnout, and develop a curriculum with lectures and reflection space, among other suggestions. Importantly, they prioritize the need for a residency to agree on a shared definition of wellness and its components that is more than just the absence of burnout. The authors describe organizational changes that have resulted from this program, including establishment of “wellness

partners” for each resident and increased openness to discussing burnout. The authors do not provide formal qualitative or quantitative outcome data on the effectiveness of the interventions.

Contribution: Although this paper does not provide formal evaluation data, it provides a useful case description of one program’s experience implementing broad-based, stakeholder-driven initiatives to enhance a culture of wellness. It may be especially useful as a starting point for programs that are beginning to develop wellness interventions. Though a useful framework, some of the specific strategies that are recommended may not be generalizable or feasible for large programs.

Cost: Unknown.

Sheehan D, Wilkinson TJ, Billett S. Interns' participation and learning in clinical environments in a New Zealand hospital. *Acad Med* 2005;80(3):302-308. [PMID: 15734818](#).

Impetus: Successful resident learning is a combination of individual processes and collaborative and social processes. To maximize learning by residents, it is critical to understand not only the behaviors residents need to learn, practice and display, but also the characteristics of the clinical environment that promote resident involvement with clinical teams.

Description: This study explored intern engagement in their clinical training programs at a New Zealand hospital through interviews and focus groups. Interview questions were designed to seek information about perceived useful clinical experiences, levels of team involvement and interaction, and situations or behaviors that facilitated or inhibited learning. Researchers synthesized data from interviews to create emerging themes and propose a tentative model that informed focus group discussions. Additional data was collected, analyzed, and combined with initial data to develop a second model. This revised model was presented to two groups of teaching practitioners for reactions, comments, and proposed revisions. Data was used to create a final model, which supported themes generated throughout the study.

Contribution: A model of resident participation and learning was developed, which identified components necessary for the creation of positive learning environments. These include institutional factors, barriers, and individual behaviors that impact participation and learning. Factors that encouraged participation included individual team members taking responsibility; learners’ ability to identify group attributes, preferences, and informal guidelines; positive relationships between resident and supervisor; interactions between resident learners and experienced staff; and the use of questioning and feedback practices by these experienced practitioners. Lack of time with a supervisor was found to be a critical barrier to participation and learning. Future application of the model is proposed and includes faculty development, rotation design, and educating students and residents.

Cost: Costs were not discussed, but likely included qualitative research costs of transcription, which is time- and person-intensive.