

# A systematic review of burnout and its relation to work-life balance and scheduling among United States physicians

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## ABSTRACT

*Physician burnout has been recognized as a multifactorial issue leading to detrimental outcomes for both the individual physician and patients being treated. Burnout is defined as “a pathological syndrome in which emotional depletion and maladaptive detachment develop in response to prolonged occupational stress.” It has been proven that poor work-life balance, a state in which personal life and professional life are in a state of imbalance, is directly connected to burnout. Upward of 61% of all United States physicians are dissatisfied with their work-life balance (WLB). Burnout rates among physicians are positively correlated with frequency of work-home conflicts leading to greater dissatisfaction of their WLB. With the prevalence of burnout among US physicians ranging between 34–76%, addressing modifiable causes such as optimizing WLB should be a priority for administrators and residency directors. In this systematic review, we explore the importance of creating a schedule that prioritizes protecting a physician’s WLB as a means to decrease burnout and the associated sequelae, including medical errors, alcohol and drug abuse, and depression. After identifying 202 studies through a PubMed keyword search and screening for specific criteria, data from 21 articles published between 2011–2018 were included and analyzed. We found that schedules that emphasize the following parameters were protective of physician WLB and burnout: <70-hour work week goals, a maximum of one on-call night per five consecutive days, providing physicians with schedule information a minimum of one month in advance, limiting the number of consecutive work days to five, and providing allotted vacation time. As the importance of mental health and wellness within the health care setting are being regarded as a cause of concern, it is apparent that positive changes need to be made.*

**Keywords:** Physician, work-life balance, burnout, schedule

## INTRODUCTION

Physician burnout is a complication of practicing medicine. The prevalence of burnout may range anywhere between 34–76%<sup>1-7</sup> and is especially pervasive among young physicians who are dissatisfied with

their Work-Life Balance (WLB).<sup>1,8-11</sup> Hospital administrators and residency directors should be keen to minimize burnout among their practitioners to avoid the associated sequelae. The implications of these side effects carry not only potential financial burdens to the hospital but are profoundly devastating to the individual practitioners and their families.<sup>3</sup>

The list of potential detrimental effects on society caused by burnout is extensive, and the need for intervention is becoming more apparent. One Mayo

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Clinic study used standardized burnout and satisfaction scores within its community and found that as physicians’ burnout scores increased, their work hours and productivity decreased. This invariably led to decreased access to care for patients as each practitioner in the burnout category had fewer work hours, performed fewer surgeries, and reduced their full time work hour equivalents.<sup>12</sup>

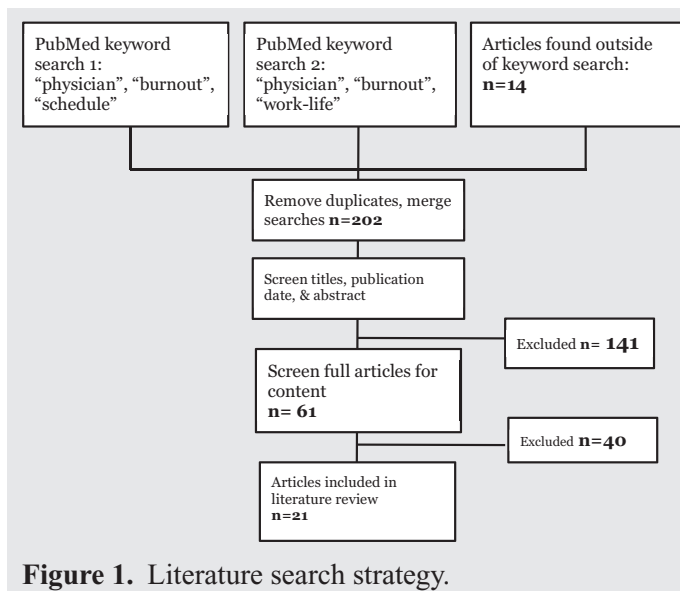
There is also substantial evidence that links physician burnout with physician depression, and behavioral impairment is a recognized risk factor for medical errors. A 2016 survey found that depressed pediatric residents were >6 times more likely than the non-depressed residents to make medical errors, causing distress to patients and families and increasing hospitals costs due to ordering unnecessary tests and incidental patient harm.<sup>13</sup> A national study of 8,000 U.S. surgeons noted that 9% admitted making a medical error during the three months of the study with a positive relationship between burnout scores and errors.<sup>14</sup> Another study reported that oncologists characterized as “burned-out” were linked to personal repercussions that included breaking off personal relationships, alcohol abuse/dependency, and suicide risk.<sup>15</sup>

The causes of burnout among U.S. physicians are certainly multifactorial; however, it often can be attributed to one of two central reasons: First, the inherent stress of practicing medicine and second, the demanding and tedious schedules required to remain a current and safe practitioner. In this study, we aimed to evaluate the latter, noting that, while the nature of medicine hinders the ability to create ideal scheduling parameters, certain elements can be correlated with WLB satisfaction and should be addressed when possible.<sup>16</sup>

In this literature review, we highlight which elements of physicians’ schedules increase WLB satisfaction and, therefore, may serve as a means to decrease burnout.

**METHODS**

A PubMed electronic search was completed using the search terms physician, schedule, burnout, and work-life balance (Figure 1). Two hundred two unique article titles and abstracts were identified and screened



**Figure 1.** Literature search strategy.

using predetermined inclusion and exclusion criteria (Figure 2). Sixty-one full articles were identified and screened. The search query included all available articles up to October 2017. The inclusion criteria used focused on data published between January 1, 2011, and October 1, 2017, U.S. physicians and their partners, evaluation of contributing factors of burnout, work-life balance, work-home conflicts, and/or quality of life. Exclusion criteria were articles not based on U.S. physicians. All statistical analysis was performed in SAS 9.4. Aggregate odds ratios and confidence intervals were calculated using the inverse variance method. Statistical significance was set to <0.05.

1. Publish date between January 1, 2011 and October 1, 2017
2. United States physicians or partners of United States physicians
3. Evaluates contributing factors of burnout, work–life balance, work–home conflicts, and/or quality of life
4. Full manuscript available in English

**Figure 2.** Inclusion criteria.

## RESULTS

A total of 21 articles met inclusion criteria.<sup>1–11,13,17–25</sup> A complete list of the articles and their key characteristics are summarized in Table 1. Eighteen of these articles included data from cross-sectional, retrospective studies,<sup>1–5,7–11,17–25</sup> one study was a randomized, multicenter trial,<sup>7</sup> and two had cross-sectional, longitudinal designs.<sup>2,13</sup> Eighteen studies collected data from physicians<sup>1–6,8–11,13,17–22</sup> and three from spouses/significant others of physicians.<sup>15,23,25</sup> A variety of validated and non-validated measurement tools were used for data collection and analysis. The 2-item or full Maslach Burnout Index were the two most common methods to identify burnout and were used in 14 of the articles.<sup>1,3–5,8–12,14–17,20–23,25</sup> We found schedules that emphasize the following parameters improved physician WLB and reduced work-home conflict and burnout: <70 hour work week goals,<sup>3,5</sup> a maximum of one on-call night per five consecutive days,<sup>1,3,4,5,9–11,22,23</sup> providing physicians with schedule information a minimum of one month in advance,<sup>2,13</sup> limiting the number of consecutive work days to five,<sup>3</sup> and providing allotted vacation time.<sup>21</sup> The current literature on physician schedules reported a correlation between work-home conflicts and the risk of physicians' experiencing burnout.<sup>1,10</sup> The studies reported that physicians who experience difficulties in their home lives were more susceptible to have the negative outcomes associated with physician burnout.

Although the reported hour ceiling of 70 hours produced an odds ratio suggesting burnout protection, it was determined that working greater than 60 hours<sup>10</sup> increased the likelihood of work-home conflict. On further evaluation, the reviewed manuscripts, while not specific to a particular specialty, produced the following odds ratios: Working >70 h/wk positively correlated with burnout: 2.50 (2.15–2.91); Each additional hour of work per week correlated with burnout: 1.02 (1.01–1.02); Each additional night on call, burnout: 1.05 (1.03–1.06); More than one night on call per week, emotional exhaustion: 1.96 (1.29–2.97); More than two nights on call per week, burnout: 1.95 (1.58–2.4); 5 days or more in between nights on call, burnout: 0.62 (0.45–0.86); > 50 work hours per week, satisfaction with WLB: 0.21 (0.13–0.33); >60 work hours per week,

likelihood of work-home conflict: 2.27 (2.03–2.54); Recent work-home conflict, burnout: 2.46 (2.20–2.75); 2+ nights on call per week, likelihood of work-home conflict: 1.32 (1.18–1.46); Takes vacations, burnout: 0.86 (0.75–0.98); Known schedule at least one month in advance, job satisfaction: 3.6 (1.91–6.79); (as referenced in Table 2).

## DISCUSSION

Upward of 61% of all US physicians are dissatisfied with their WLB.<sup>8,16–19</sup> Burnout rates among physicians are positively correlated with frequency of work-home conflicts and dissatisfaction of WLB.<sup>1,8–11</sup> Many young practitioners beginning their medical careers have experienced burnout at alarming rates. The prevention of depression, alcoholism, and ultimately medical errors should remain a mutual interest of providers and their employers and hospitals. Physicians experiencing burnout are twice as likely to be involved with patient safety incidents, twice as likely to provide suboptimal care to patients, and three times more likely to receive low patient satisfaction scores. The financial burden acquired through during training has increased over the past decade, and protective measures if available should be implemented to preserve physicians' mental health. Previous meta-analyses have shown the correlation between patient outcomes and physician burnout, and there have not been clear scheduling recommendations to prevent burnout and/or protect physicians' mental health.<sup>26</sup>

We present suggestions to help reduce the rising incidence of physician burnout within medicine's current culture. Based on our findings, an ideal schedule could be best implemented within group practices with 5 or more physicians in most specialties. This would include work schedules being made at least one month in advance. Each physician could rotate call allowing for optimal rest time in between. On weekend call, some physicians could remove a day of work, e.g., take Friday off in substitution for a call Saturday, leading to a <70-hour work week. Vacation time can be approved with >1-month notice to allow providers to adapt their schedules as needed. While this review provides for some broad starting points for administrators to use in their own departments, there are limitations to this

**Table 1. Characteristics of Studies Included in Review**

Source	Design	Population	Training Level	Number	Response Rate	Mean Age	Burnout, QOL, etc measurement tools
Ali, 2011 <sup>6</sup>	Cohort study, RCT	Intensivists	Attending	39	87%	41	NV
de Oliveira, 2013 <sup>5</sup>	CS	Anesthesiologists	Residents	1508	54%	–	12 question MBI-HSS, HANDS, scales for errors
Dyrbye, 2012 <sup>2</sup>	CS	Surgeons	All levels	7197	28.7%	–	2-item MBI, 2-item PRIME-MD
Dyrbye, 2011 <sup>1</sup>	CS	Surgeons	All levels	7858	31.5%	51	MBI, 2-item PRIME-MD, SF-12
Dyrbye, 2013 <sup>7</sup>	CS	Physician partners	None	891	54%	–	2-item MBI, QOL LASAs, PRIME-MD
Dyrbye, 2013 <sup>8</sup>	CS	All specialties	All levels	7288	26.3%	–	MBI
Dyrbye, 2011 <sup>9</sup>	CS	Physician Faculty, internists	Attending	465	82.2%	–	2-item MBI
Guest, 2011 <sup>11</sup>	CS	Faculty, surgical oncologists	Attending	72	73%	–	MBI-HSS, LASA QOL, AUDIT
Holmes, 2017 <sup>4</sup>	CS	All specialties	Residents	307	61%	–	MBI, PHQ-9
Qureshi, 2015 <sup>3</sup>	CS	Plastic Surgeons	Attending	1691	28.5%	51	MBI, SF-8, PRIME-MD, AUDIT
Rabatin, 2016 <sup>2</sup>	CS & L	Family physician, general internists	Attending	422	56.0%	–	NV
Roberston, 2017 <sup>19</sup>	CS	Primary care	Residents, teaching physicians	585	68%	–	NV
Sargent, 2012 <sup>25</sup>	CS	Physician partners	None	428	–	–	MBI, GHQ-12, RDAS
Shanafelt, 2014 <sup>17</sup>	CS	Oncologists	Fellows	1,373	83.9%	33	2-item MBI
Shanafelt, 2013 <sup>23</sup>	CS	Physician partners	None	891	54.2%	51	NV
Shanafelt, 2012 <sup>21</sup>	CS	Surgeons	All levels	7197	28.7%	53	2-item MBI, QOL LASA
Shanafelt, 2012 <sup>20</sup>	CS	All specialties	All levels	7288	26.7%	55	2-item MBI
Starmer, 2015 <sup>13</sup>	CS & L	Pediatricians	New attendings	840	93%	–	NV
Streu, 2014 <sup>22</sup>	CS	Plastic Surgeons	Attending	505	71%	–	MBI-HSS
Szender, 2016 <sup>18</sup>	CS	Gynecologist oncologist	Attending	290	28.9%	–	NV
Teixeira-Polt, 2017 <sup>24</sup>	CS	Neurologists	Attending	625	39.1%	–	NV

CS = cross-sectional, L = longitudinal, QOL = quality of life, NV = non validated, MBI-HSS = Maslach Burnout Inventory-Human Inventory Services Survey, HANDS = Harvard National Depression Screening Day Scale, QOL LASA = Quality of Life linear algorithm self-assessment, GHQ-12 = 12 item general health questionnaire, RDAS = Revised Dyadic Adjustment Scale, SF-8 = Optum SF-8 Health Survey, PRIME-MD = Primary Care Evaluation of Mental Disorders, AUDIT = Alcohol Use Disorders Identification Test

**Table 2. Odds Ratios**

Parameter	Odds Ratio	95% Confidence Interval		Source
<b>Hours per week, burnout</b>				
Working > 70 h/wk positively correlated with burnout	2.50*	2.15	2.91	de Oliveira, Change; Quershi
Each additional hour of work per week correlated with burnout	1.02*	1.01	1.02	Shanafelt, Oreskovich; Dyrbye, Shanafelt; Dyrbye, West
<b>On call nights, burnout</b>				
Each additional night on call, burnout	1.05*	1.03	1.06	Shanafelt, Oreskovich; Dyrbye, Shanafelt; Dyrbye, Varkey
More than one night on call per week, emotional exhaustion	1.96*	1.29	2.97	Streu
More than two nights on call per week, burnout	1.95*	1.58	2.40	Qureshi
5 days or more in between nights on call, burnout	0.62*	0.45	0.86	de Oliveira, Chang
<b>Work-home conflict as related to burnout, hours, and on call nights</b>				
>50 work hours per week, satisfaction with WLB	0.21*	0.13	0.33	Starmer
>60 work hours per week, likelihood of work-home conflict	2.27*	2.03	2.54	Dyrbye, Freischlag
Recent work-home conflict, burnout	2.46*	2.20	2.75	Dyrbye, Verkey; Dyrbye, West
2+ nights on call per week, likelihood of work-home conflict	1.32*	1.18	1.46	Dyrbye, Freischlag
<b>Continuous vacation and burnout</b>				
Takes vacations	0.86*	0.75	0.98	Shanafelt, Oreskovich
<b>Knowledge of schedule, Satisfaction</b>				
Know schedule at least one month ahead of time	3.60*	1.91	6.79	Starmer

\*Indicates statistical significance at the 0.05 level.

review that require more research. Each field of medicine has its own unique scheduling, call requirements, and patient volume that may not work with our conclusions. More studies looking at specific specialties in medicine are needed to supplement our review that included many different specialties of medicine.

While physician burnout is becoming more common in physicians at all stages of their careers, physicians-in-training are apt to have more difficult professional responsibilities and more challenging home lives since they are often starting families and thus at a different stage in their lives than older

attending physicians. Seven of our reviewed articles included an average age of their physicians in their data, but only two averages were below the age of 50, and one was below 30. More evaluation of physician burnout during different stages of their careers could provide useful insight for administrators to better anticipate challenges physicians face over the course of a career. Last, like most literature reviews, our study was limited by our inability to quantify burnout across multiple studies. Unlike a laboratory value, identifying physician burnout is a difficult task that takes skill by the examiner and the physicians being evaluated for burnout to accurately report signs and symptoms.



## CONCLUSIONS

The following are modifiable factors within physicians' schedules that may increase satisfaction with WLB and thus decrease burnout:

1. <70-hour work week<sup>13–16</sup>
2. A maximum of one on-call night per five consecutive days<sup>1,5,7,8,13–17</sup>
3. Providing physicians with schedule information a minimum of one month in advance<sup>10,12</sup>
4. Limiting the number of consecutive work days to five<sup>18</sup>
5. Providing allotted vacation time.<sup>11</sup>

We recommend creating schedules that incorporate frequent short breaks over those that emphasize infrequent but longer vacation times as a means to make these scheduling goals more realistic.

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