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## REVIEW ARTICLE

# Burnout in anesthesiology



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### KEYWORDS

Burnout;  
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### Abstract

**Background and objectives:** Burnout is a chronic condition caused by high levels of stress and anesthesiology is a stressful medical specialty with more vulnerability to burnout. The aim of this study is to review the characteristics and impact of burnout in anesthesiology.

**Contents:** In this review, the stressors and risk factors, manifestations, assessment, complications, management and prevention of burnout as well as the inconsistent research found in the state-of-art are approached.

**Conclusions:** Anesthesiologists are in a high-risk group to develop burnout, with different manifestations and consequences such as suicide or medical errors. Although there is no specific treatment yet, there are a lot of helpful measures to cope this condition. Prevention is considered an important step in order to reduce the prevalence of burnout.

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### PALAVRAS-CHAVE

Burnout;  
Anestesiologia

### Burnout em anestesiologia

#### Resumo

**Justificativa e objetivos:** Burnout é uma condição crônica de esgotamento causada por níveis altos de estresse e a anestesiologia é uma especialidade médica estressante com maior vulnerabilidade ao burnout. O objetivo deste estudo foi revisar as características e o impacto do burnout em anestesiologia.

**Conteúdo:** Nesta revisão, são abordados os estressores e fatores de risco, manifestações, avaliação, complicações, manejo e prevenção do burnout, bem como as pesquisas inconsistentes encontradas no estado da arte.

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*Conclusões:* Os anestesiológicos estão em um grupo de alto risco para desenvolver *burnout*, com diferentes manifestações e consequências, como suicídio ou erros médicos. Embora ainda não haja tratamento específico, existem muitas medidas úteis para lidar com essa condição. A prevenção é considerada um passo importante para reduzir a prevalência de *burnout*.

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## Introduction

The discoveries and challenges we face every day push us forward, and increase our demands, to achieve the goals we set ourselves whether personal, social or professional level. These on-going demands have an impact on our well-being and mental health, increasing prevalence of disorders such as burnout.

The burnout is a global condition related to chronic exposure to professional stress-causing factors and it is characterized by emotional exhaustion, low sense of personal accomplishment and depersonalization.<sup>1-3</sup> The burnout condition has been identified to affect various professional areas, where professionals share some common features such as: facing high levels of constant requirement and interaction with people with physical and emotional needs.<sup>3,4</sup>

The anesthesiology is a branch in medicine that meets these requirements, where anesthesiologists are recognized with high probability of developing burnout.<sup>3,5</sup> However, though anesthesiology is considered a stressful specialty, there are not many studies published on burnout in anesthesiology.<sup>2</sup>

In this work, we first perform a state-of-the-art review on this topic. In particular, we carry out a thorough analysis on the impact of burnout in anesthesiology, as well as an analysis of some risk factors and consequences of burnout in clinical practice of anesthesiologists.

## Material and methods

### Search strategy

This study performs a literature review on burnout in a specific specialty – the anesthesiology. The identification of the articles was carried out through a literature search in MEDLINE and SCOPUS databases, from 1980 to 2014. The search was conducted in the period from July to September 2015. The search strategy used the following keywords: “burnout”, “burnout syndrome”, “physicians’ burnout”, “occupational stress”, “occupational burnout”, “anesthesia” and “anaesthesia”. The final query can be found in Fig. 1.

All references were reviewed for completion of the research.

### Exclusion and inclusion criteria

Considering the following inclusion criteria narrowed the search: studies published during last 35 years (from 01/01/1980 to 31/12/2014), articles published in English or Portuguese, and involving humans. Clinical Trials, editorials, chapters, letters to the editor, reviews and systematic reviews were included. Articles published in other languages and without access full text were excluded. The selection was made based on the conformity between the theme and the objectives of the literature review; therefore, articles in the search without relation with either burnout or specialists in anesthesiology were excluded, as well as articles on burnout in physicians from other specialties. Besides, other articles without distinction between anesthetist’s nurses or other physicians and anesthesiologists were also excluded. Repeated articles were excluded by screening the titles.

### Selection strategy

In total, 652 articles from the two databases (63 articles from MEDLINE and 589 articles from SCOPUS) were obtained. The first selection was performed by screening the titles, taking into account our exclusion criteria, and 559 articles were excluded. Then, it was conducted a second selection by reading the summaries of the remaining articles. Totally, 26 papers were excluded in this phase: 9 by referring to other specialties/non-medical areas, 16 for not being related to burnout, 2 for not distinguishing anesthesiologists and other health-care professionals. From the remaining 67 articles, 28 papers were excluded after careful reading: 3 by referring to other specialties/non-medical areas, 21 for not being related to burnout, 2 for not distinguishing anesthesiologists and other health-care professionals, 2 for not having a simple access; 39 articles were included attending this third selection. After a careful revision of the references of selected literature, 6 articles were included; in total, 45 articles were included in our review. Fig. 2 illustrates the screening and information selection processes.

### Results from the literature

Burnout is a psychological syndrome characterized by emotional exhaustion, depersonalization and reduced personal accomplishment as a result of a chronic exposition to stress at work. Therefore, considering burnout as a cyclic process

MEDLINE	burnout[All Fields] OR (burnout[All Fields] AND ("syndrome"[MeSH Terms] OR "syndrome"[All Fields])) OR (("physicians"[MeSH Terms] OR "physicians"[All Fields]) AND burnout[All Fields]) OR (occupational[All Fields] AND ("Stress"[Journal] OR "stress"[All Fields])) OR (occupational[All Fields] AND burnout[All Fields]) AND ("anaesthesia"[All Fields] OR "anesthesia"[MeSH Terms] OR "anesthesia"[All Fields]) AND ("anaesthesia"[All Fields] OR "anesthesia"[MeSH Terms] OR "anesthesia"[All Fields]) AND ("loattrfull text"[sb] AND ("1980/01/01"[PDAT] : "2014/12/31"[PDAT])) AND "humans" [MeSH Terms] AND (English[lang] OR Portuguese[lang])
SCOPUS	burnout OR burnout syndrome OR physicians burnout OR occupational stress OR occupational burnout AND anesthesia AND anaesthesia AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "Portuguese") ) AND ( LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009) OR LIMIT-TO (PUBYEAR, 2008) OR LIMIT-TO (PUBYEAR, 2007) OR LIMIT-TO ( PUBYEAR, 2006) OR LIMIT-TO (PUBYEAR, 2005) OR LIMIT-TO ( PUBYEAR, 2004) OR LIMIT-TO (PUBYEAR, 2003) OR LIMIT-TO ( PUBYEAR, 2002) OR LIMIT-TO (PUBYEAR, 2001) OR LIMIT-TO (PUBYEAR, 2000) OR LIMIT-TO (PUBYEAR, 1999) OR LIMIT-TO ( PUBYEAR, 1998) OR LIMIT-TO (PUBYEAR, 1996) OR LIMIT-TO ( PUBYEAR, 1995) OR LIMIT-TO (PUBYEAR, 1993) OR LIMIT-TO (PUBYEAR, 1991) OR LIMIT-TO ( PUBYEAR , 1987) )

Figure 1 Query used in our research.

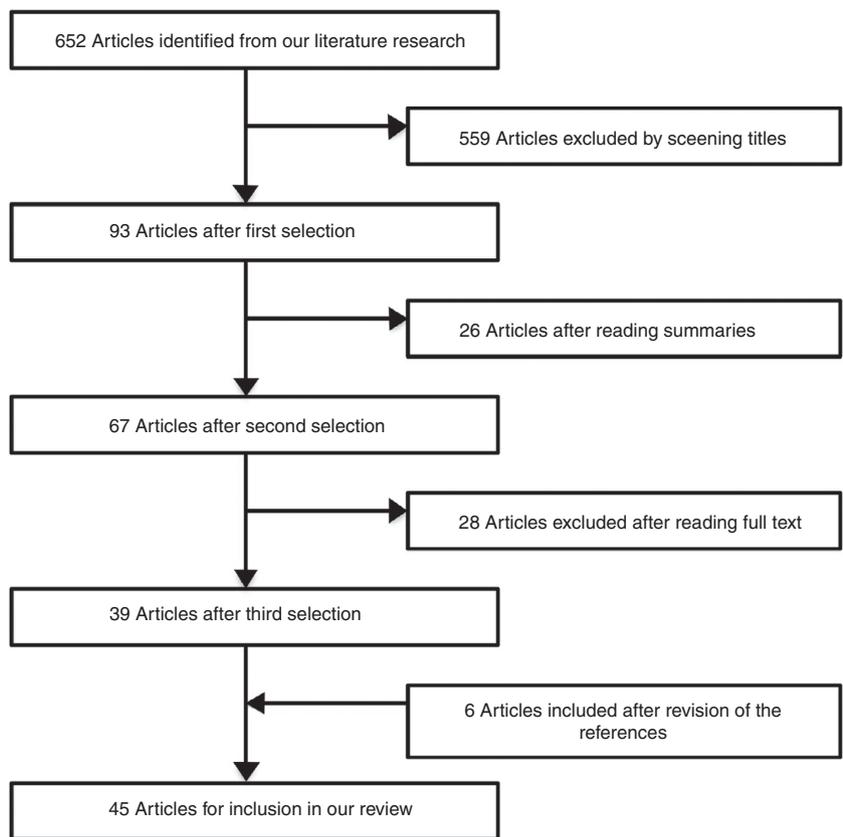


Figure 2 Selection strategy.

that develops over time, some authorities have split this process into several steps/stages; however, there are different models of burnout process ranging according to the author who described them.<sup>6</sup>

This syndrome can be classified into three subtypes, depending on the way of dealing with stress and frustration at work according to Farber, and according to the level of dedication at work.<sup>7-9</sup> The burnout subtypes are: "worn-out" subtype, classic subtype (frenetic) and under-challenged subtype, which characteristics are described in Table 1.<sup>6-11</sup>

As long as anesthesiologists are specialists working in emergency care, intensive care medicine, in the management of acute and chronic pain and, some of them, still carrying out research, teaching or administrative responsibilities, the chances of getting burnout are high.

In fact, considering stress as a nonspecific adaptive response of the body to any change, demand, pressure, challenge, threat or trauma, a certain amount of stress is necessary in order to function well in any demanding job. However, when stress becomes excessive and we feel unable to cope with challenges, the harms may outweigh the benefits and adversely affect a physician's humanity, ethical integrity, moral integrity, physical condition, psychological stability and capacity to care for patients in a safe mode.<sup>12-14</sup> Besides that, a study reveals that 90% of people undergo highly stressful events at least once a week. The same study concludes that 90% of all visits to primary care are associated with stress disorders and 50% of medical prescription is for treat stress conditions.<sup>14</sup> The incidence of stress among anesthesiologists varies across the studies founded in the literature. Most studies consider that anesthesiologists have moderate stress levels.<sup>15</sup> According to one study, 68% of anesthesiologists in Finland feel stressed.<sup>16</sup>

## Stressors and risk factors

Anesthesia is extremely stressful, with the potential to severely damage or even kill the patient if anything goes wrong.<sup>17</sup> In this way, it seems to be important to identify general sources of stress and to state, categorically, individuals suffering from excessive stress.

Herein the stressors are divided into two categories: those related with work and those related with administrative and domestic fronts.<sup>17</sup> The major sources of stress at work were identified as lack of control, professional relationships, work overload, chronic sleep deprivation and increasing pressure of managerial responsibility. In administrative and domestic fronts, the major stressors are: administrative responsibility and the conflict between the demands of work and home/family.<sup>15-17</sup>

At the same time, burnout can be related with independent risk factors, such as age and gender.

### Lack of control

Several studies have shown the lack of control is the most important stressor in all aspects.<sup>17,18</sup> The aspects contributing to lack of control are: overtime (anesthesiologists frequently work uncertain hours), work planning (their work pattern is defined by other specialists and frequent

changes during the day), the increasing necessity to be successful (in postgraduate or residential examinations or as a consequence of competition between colleagues), lack of resources/equipment (sometimes equipment still poorly designed and not easy to manage; at other times new equipment is placed in daily practice without enough explanatory data and in-service training; the lack of resources requires the achievement of techniques, such as regional anesthesia, blindly), inadequate conditions of work place (such as, exposure to radiation, latex and infection; visual challenges related with lighting, darkness, monitors or lasers; or, noisy pollution, caused by surgical machinery, monitors and alarms, conversation or music, can decrease mental efficiency and impairment of short-time memory and verbal communication) and difficulty to take a break and planning non-clinical tasks (such as lectures or scientific research or even breaks for hydration or nutrition). It is difficult to know how this can be addressed, given the service nature of this specialty.<sup>13,14,18-22</sup>

### Professional relationships

The relationship between professionals can be a stress factor. In many studies, anesthesiologists consider that surgeons are the cause for developing high levels of stress at work. Other factors for job dissatisfaction are the lack of communication, the lack of clinical autonomy, lack of recognition/referral by other colleagues, particularly surgical colleagues, and the disagreement between clinical situations<sup>1,2,18</sup>; However, the lack of recognition is not a problem involving only colleagues; a lot of anesthesiologists suffer with a poor recognition by patients (which can be explained by the limit contact between patient-doctor).<sup>19,23</sup>

In some countries, could exist another situation very stressfully, that is the competition between anesthesiologists and other non-medical professionals in the operation room, such as nurse anesthetists.<sup>20</sup>

Sometimes, anesthesiologists have to communicate bad news, as anesthetic complications, and have to deal with the reaction of family and medical community, which is not always easy to face.<sup>20</sup>

### Work overload

Work overload is linked with time constraints, which are common reasons for stress in anesthesiologists. A great deal of stress can be associated with pressure to get lists going on time, produce a rapid turnover, travel between different hospitals and/or take care for more than one patient at same time. With the development of same-day admissions, anesthesiologists are often under pressure to arrive early to work place, reviewing patients who have never previously been checked, and inducing anesthesia within short-time frames.<sup>14,18</sup>

In other way, work overload is linked with the lack of and misdistribution of anesthesiologists.<sup>24</sup> The uneven number of anesthesiologists between different regions is considered by many a stress factor.

### Pressure of managerial responsibility

Time management and organizational factors (such as conflict with other colleagues, fear of human error or incompetence) are often not well managed (than clinical

**Table 1** Typology of burnout and its characteristics.

Subtypes of burnout	Level of dedication at work	Main value	Characteristics
Frenetic	High	Involvement	Overload Grandiosity Highly applied and committed individuals Works to the point of exhaustion Neglecting own needs Increasingly greater efforts in the face of difficulties High involvement in work Ambition and need for achievements Inability to acknowledge failure Anxiety and irritability
Under-challenged	Intermediate	Indifference	Lack of development Indifference and superficiality in tasks Boredom Negatively affected by monotonous work Absence of overload-induced stress Contemplating another job Lack of challenges, motivation or desire for engagement
Worn-out	Low	Neglect	Lack of control Lack of recognition Difficulties in performing tasks Lack of involvement in work Difficulties in performing tasks Neglecting responsibilities Depressive symptoms Give up apathetic lack of enthusiasm

scenarios) and may contribute to a greater degree of stress in physician anesthesiologists and how stress is managed by them.<sup>2,25,26</sup> In terms of time management, anesthesiologists are forced to make quick decisions in critical situations and swiftly and safely carrying through necessary actions.<sup>1,26</sup> As the public demand safe care, mistakes are not tolerated anymore; therefore the pressure caused by lack of time should not exist. Sometimes anesthesiologists have to face difficult clinical situations, such as the commitment of vital functions.<sup>27</sup> This risk factor is related to other risk factor – work overload, in a way that the stress caused by work overload can affect time management.

#### Administrative stressors

There are some factors of stress encompassing the administrative area. One of them is the administrative responsibility. But there are others, such as the financial remuneration conflicts, prospects for promotion, the permanent trend to reduce costs and increase revenues or the production pressure created by competition in the health care industry.<sup>20,22</sup>

A major stress factor, which worries anesthesiologists and could lead to unsafe actions and decisions, is related with the increasing number of legal suits. In fact, malpractice and legal suits is among the most stressful experiences, because it affects the ability of doctors as professionals and as human beings.<sup>14,22</sup>

#### Conflict between the demands of work and home/family

Combine work life with personal/emotional life is not an easy task. Therefore, to be successful in both areas is an extremely demanding and exhausting challenge. In other perspective, the excessive stress in one area will have repercussions in the other one and shake the balance between the two. So, comes up the necessity of compensation, which will be able to come from personal relationships, such as spouse. When one spouse is a doctor, there are two possibilities to explain this conflict: one of them considers that the spouse may be stressful and cause emotional instability; the other line of thought argues that the spouse is the most important coping resource for managing stress.

Other important factors are related to personal animosities, poor social climate, household chores, family care (whether with children who need parental support, whether with partner or parents) or their own personal space that is essential to replace batteries.

In another perspective, entirely opposed, the lack of support and loneliness may be considered risk factors with a great impact on predisposition to develop burnout.<sup>2,15</sup>

#### Age

Concerning the age as a factor, the evidences are controversial. Some authors defend burnout is a age-related problem, causing more problems among anesthesiologists in their 40s to 50s due to declining health and physical limitations.<sup>16,17</sup> In elder anesthesiologists, the cognitive performance may be impaired, particularly after night shifts. Nevertheless, less

aware of their degree of commitment, as well as less able to sustain the performance across a night shift, or successive nights are some aggravating factors that may be present and complicate the situation.<sup>28</sup> The on-call commitment is an important predictor in the early retirement decision by older anesthesiologists.<sup>29</sup>

Anesthesiologists at middle age are very susceptible to develop a 'great thirst for life', connected with the fear of having missed something important and the fear of not accomplish all the goals, because the future is not unlimited.<sup>1,12</sup> The reconsideration and restructuring of their lifestyle can involve new directions and challenges related with job-stress factors, high pressure to perform and private factors, such as confrontation with growing children, the purchase of property, the responsibility of caring their parents, the deaths of relatives, their spouses/partners and their own well-being.<sup>12,14</sup>

Others defend a job dissatisfaction is higher in younger anesthesiologists and it affects some specific items: compensation, creativity, recognition and accomplishment, which can be explained by payment, economic uncertainty, production pressure, interpersonal relationships, less experience in anesthetic techniques and priority to professional life over personal life.<sup>16,24,25</sup> Younger anesthesiologists during their training are more trending to develop burnout compared with other medical specialists.<sup>30</sup>

Aware that age is related to the stage in career, we can extrapolate that the factors that cause stress vary with age. So, compare the stress levels of young anesthesiologists at the beginning of his career with a trainee anesthesiologist or with an anesthesiology program director becomes difficult.<sup>14,31</sup>

### Gender

Some studies show a correlation between burnout and gender. There are more women reporting higher stress levels than men; on the other hand, female doctors are more likely to report signs and symptoms of occupational burnout than male doctors (especially in the emotional exhaustion component).<sup>12,15,16,24,27,29</sup> The reason for that can be explained, by accumulative level of stress caused by family-related duties and work organization in female anesthesiologists. But there are other sources of stress and professional dissatisfaction of women: lack of support, sexual harassment from colleagues or patients, discrimination at the workplace, domestic violence, the number of children, gender roles in the society and the influence of social expectations.<sup>2,14,22,25,32</sup>

### Burnout manifestations

Clinical manifestations of burnout are nonspecific and include fatigue, headache, rise in blood pressure and pulse rate, sleep and eating disorders and emotional instability.

This process can start with early signs of stress arousal (such as irritability, forgetfulness or sleep disorders). Then, anesthesiologists try to compensate stress with social withdrawal, cynicism and persistent tiredness, but this compensation quickly reveals to exhaustion and, in this phase, begin emerging depression or anxiety symptoms,

chronic pain syndromes or functional disorders of the cardiovascular or gastrointestinal system.<sup>12</sup>

Burnout can have similar symptoms to others psychiatric disorders. In that way, to prevent mistakes and devastating consequences, it is very important distinguish and compare burnout with other disorders. For example, burnout affects primarily the life of the individual at work, whereas depression also affects personal life outside of work. However, meaning burnout as a consequence of chronic exposure to stressful situations, burnout could occur in all spheres of life.<sup>10</sup> Mental disorders can be compared taking into account the frequency of symptoms and the presence of characteristic symptoms. On one hand, it is characteristic of burnout the presence of demoralization/subjective incompetence, fatigue or loss of energy and increased irritability. On the other hand, symptoms as depressed mood or loss of interest or pleasure is more typical of major depressive disorder. Anxiety is a characteristic of generalized anxiety disorder, post-traumatic stress disorder and acute stress disorder; besides, derealization and depersonalization are also characteristics of those last two disorders.<sup>6</sup> Therefore, considering that many of these symptoms are also common in burnout, it is applicable to make a careful evaluation in order to not make mistakes in the diagnosis.

In other perspective, many authors divide the burnout manifestations in four categories, described in [Table 2](#).<sup>14,33</sup>

Thus, these manifestations are related to the individual, interpersonal, organizational and social context. The mechanisms involved in burnout manifestations still unclear and can be influenced by intrinsic and extrinsic factors, described in [Table 3](#).<sup>6,10,15</sup>

### Burnout assessment

The Maslach Burnout Inventory (MBI) is a well-recognized and validated tool for assessing burnout among several countries. This is a 22 item scale related with the three basic dimensions of burnout: emotional exhaustion, depersonalization and personal accomplishment. Emotional exhaustion, feeling emotionally overextended by work, represents the individual-stress dimension of burnout and is considered a central symptom, which is influenced by the work environment (measured by nine questions). Depersonalization, a feeling of an impersonal approach and interaction with people, represents the interpersonal context of burnout and is considered a coping self-preserving technique in response to emotional overload (assessed by five questions). Personal accomplishment, a feeling of personal achievement and competence at work, represents a subjective evaluation made by individual, usually influenced by depersonalization; wherein the negative feeling can be increased by moral distress situations (measured by eight items). The Maslach Burnout Inventory requires participants to mark how often they experienced each of the situations on a rating scale of seven points, from never (0) to always (6). The three dimensions of burnout were estimated by summing the responses of participants on each subscale: an emotional exhaustion score (range 0–54); a depersonalization score (range 0–30) and a personal accomplishment score (range 0–48). A standard coding template

**Table 2** Categorization of burnout manifestations.

Physical illness	Emotional deterioration	Behavioral aberrations	Intellectual dysfunction
Hypertension	Chronic anxiety	Abuse of substances	Poor task performance
Increased heart rate	Depression	Impulsive or overly aggressive actions	Difficulty in concentration
Coronary heart disease	Irritable or labile personality	Hyperactivity	Forgetfulness or diminished alertness
Headache	Changing mood	Compulsive complaining	
Nausea	Fatigue		
Muscle tension syndromes	Frustration		
Chronic lumbar or cervical syndromes	Anger		
Gastritis	Undefined fears		
Peptic ulcer disease			
Colitis			
Spontaneous abortion			
Weight change depression of immune system			
Hyperventilation			
Acceleration of the aging process			

**Table 3** Intrinsic and extrinsic factors that influence burnout.

Intrinsic factors	Extrinsic factors
Frequent activation of the hypothalamic-pituitary-adrenal axis	Work conditions (e.g. malfunction or insufficient resources)
Chronic activation of autonomic nervous system	Schedule/task changes
High permanent levels of neuromediators	Work/personal life requirements (e.g. high demands or responsibility)
Predisposition to psychiatric/psychological pathology	
Own personality/trait (e.g. perfectionism)	
Previous history of psychiatric/psychological pathology	
Difficulty to cope with stressful situations	

was used to establish the burnout score, being categorized as low, moderate or high level of burnout, described in [Table 4](#).<sup>10,18,25</sup>

A high level of occupational burnout can be displayed by high levels on the emotional exhaustion and depersonalization dimensions and low levels on the personal accomplishment dimension.<sup>25</sup> However, this scoring system is not consistent among several countries. So, the interpretation of the results derived by the Maslach Burnout Inventory should be interpreted with caution.

The MBI consists in an instrument developed and validated for assessing to burnout in health care workers. However, although there are other scores for stress

assessment, this seems to be the most used in the studies found and which gathers more consensus.<sup>2</sup> In order to take into account their own goals, authors can adapt this assessment to a validated Portuguese version, for example.<sup>23</sup>

### Burnout result

Burnout can reduce the quality of medical care to the point of compromise patient safety. This condition may have serious consequences, including medical errors, suicides, accidents, abuse of substances and greater risk of

**Table 4** Standard coding template to establish the burnout score.

Dimensions of burnout	Low burnout	Moderate burnout	High burnout
Emotional exhaustion	<17	18–29	>30
Personal accomplishment	>40	34–39	<33
Depersonalization	<5	6–11	>12

cardiovascular diseases. The burnout complications can be used as indicators of high levels of stress in anesthesiology.

### Medical errors

A lot of studies demonstrate burnout increases the incidence of medical errors. In fact, long-time periods of continuous wakefulness result in deleterious effects: impaired concentration, vigilance, short-term memory, retention capacity, motor skills and ability to detect significant changes in clinical variables.<sup>29,34–36</sup> For example, 24h without sleep undermines the ability to perform certain cognitive tasks to the same degree as the ones from a blood alcohol level of 100 mg.dL<sup>-1</sup>.<sup>34</sup> However, cognitive functions are not affected equally.<sup>36</sup>

Work “on call” and night shifts may be stressful and reasons for sleep deprivation. Chronic sleep deprivation (defined as 6 or less hours of sleep a day during a period of at least two weeks) and night shifts are connected to human mood and serious health problems, or rather, can cause changes in autonomic nervous system, immunity metabolism and hormonal function and they are connected to some diseases, such as arterial hypertension, coronary heart disease, type II diabetes, obesity, thyroid dysfunction, chronic infections and musculoskeletal disorders. The cognitive performance, especially planning and creativity, can be affected and promote mental disorders, such as anxiety, depression, aggressiveness, loss of self-confidence and suicidal tendencies.<sup>16,36</sup>

In fact, humans are daytime creatures and we cannot change the circadian rhythm. One study has shown that women have an increased risk of having breast cancer caused by night shifts when compared with daytime workers.<sup>1</sup> Low melatonin and high estrogen levels produced by artificial light at night can explain the reason for such higher risk. As anesthesiology is one of the biggest specialties engaged in night shifts, consequently anesthesiologists may be in a greater risk than other physicians.

### Suicides

The suicide rate in among medical jobs is consistently reported as higher than in general jobs. At same time, some studies have shown an increased risk of suicide among anesthesiologists compared with other physicians and compared with the general physicians risk.<sup>37</sup> According to one study, 25% of anesthesiologists in Finland suffered suicide and 22% of anesthesiologists had suicidal ideation.<sup>37</sup> The same study indicates that age 50 correspond to age with highest number of suicides.<sup>38</sup> Among anesthesiologists, suicides have been suggested to indicate that stress levels in the specialty must be high.<sup>16,17</sup> However, only few studies demonstrate evidence that the incidence of suicide in anesthesiologists is higher than in other medical practitioners. Insufficient sleep, sleep disorder related to night shifts and insomnia due to work stress have been posed as sleep disturbances predisposing suicides as alcohol intoxication and some personality traits.<sup>16,37</sup>

### Accidents

There is a predisposition to accidents, particularly homecoming.<sup>16,28</sup>

### Abuse of substances

To support stressful periods, the abuse of substances such as alcohol or drugs seems to be higher in anesthesiologists. In fact, doctors in general and anesthesiologists in particular have a reputation for heavy drinking.<sup>37,39</sup> The risk of opioid abuse is higher in anesthesiologists and it can be caused by easy access to opioids.<sup>17,39</sup> Inappropriate use of illicit drugs, such as cocaine or marijuana, should be taken into account too.

There are a lot of factors that justify the abuse of illegal substances by anesthesiologists, for example, they have a detailed knowledge of pharmacotherapy and work with drugs.<sup>17,39</sup>

However, several studies have concluded the consumption of alcohol and drugs can be underestimated by self-reporting surveys.<sup>18</sup>

One study reveals that males and females do not cope differently in which concerns to the abuse of substances.<sup>40</sup>

### Other illnesses

Some studies refers that anesthesiologists have a high risk of cardiovascular diseases, a greater rate of cerebrovascular events (specially in women), an increased risk of death from AIDS and viral hepatitis as a consequence of irregular life.<sup>20,22,27</sup>

In other perspective, burnout consists in a work-related syndrome associated with service professions. It can be a precursor or correlate with mental disorders such as neurasthenia or depression; however could be difficult distinguish burnout condition by other diagnoses, which increase the needs of a good and early diagnose.<sup>6</sup>

### Management of burnout

The treatment of burnout is not well studied yet and the most therapeutic techniques involve behavior modification techniques.<sup>31</sup>

To management burnout is important to recognize the stressed behavior and to identify what causes it. After that, the goal is to eliminate the individual, environmental and collective stressors.<sup>31</sup>

Adjuvant supportive work, familiar and social environment are important compensatory mechanisms for a stressful work life, because the absence of a well-defined and organized department, professional isolation, social isolation and/or lack of other kind of support would limit the clinician’s capability to respond to periods of stress.<sup>12,18,32</sup>

Considering this as a problem with great individual variability and intrinsic characteristics to own anesthesiologist, a way of dealing with burnout consists in developing some lines of thought, such as: seeing difficulties as inherent in the specialty, accepting limits of own competence, accepting limitations of what health care can do, see moments of high demands as part of work.<sup>26,27</sup>

In several studies, participants suggest several ways to treat this syndrome, such as: greater tolerance from colleagues, surgeons and assistants; education about tools or agencies available to combat/avoid/relieve harmful stress; redress perception that anesthesia is easy; management of on-call work; the permanent presence of a senior

anesthesiologist/mentorship; promote a culture of compassion/engagement/support; availability of rest facilities and call rooms; or improve financial base and efficiency.<sup>18,22</sup>

As seen above, women have a greater predisposition to develop burnout. Yet, there is evidence that women have intelligence and physical constitution as important attributes for coping with stress.<sup>26</sup>

Another measure that is mentioned to manage burnout is the use of music at work place. Although music is associated with healing properties, ability to strengthen intellectual capacity and enhance creative spirit, music can also trigger a series of responses involving the reaction to stressful stimuli, especially in which concerning to the specific nature of the music selection and audio volume.<sup>14</sup>

Communication is also considered a measure of coping, although controversial. On one hand, communication can increase job satisfaction, being a powerful aid in the reduction of medical errors, in the relationship between colleagues and in teamwork. On the other hand, communication can create a greater number of work interruptions, thereby increasing stress. Yet, the implementation of an efficient communication system may be essential to reduce redundant and external communication.<sup>41</sup>

Furthermore, the management of burnout can take into account seven measures of a list created in order to cope with professional stress of anesthesiologists:

Self-care comprises: Physical activity (both stamina and strength); healthy habits (restful sleep and adequate rest – sleep a minimum of 6 and a maximum of 9 h/day, do not smoke, drive carefully and safely, use seat belts; do not live with a pollution risk); part-times and interests (that improves physical and psychological well-being, resilience and promote longevity); enough time to spend with family and friends; healthy nutrition (meaning a daily breakfast, a diet that assures a body mass index not higher than 23 and based in low calories, low saturated fat, no snacks; small and calculated doses of alcoholic beverages – less than 3 alcoholic drinks/day, and vitamin supplements taken in sufficient doses and daily); meditation (synonymous with deep relaxation, promoting a state of rest, release of tension, restores energy, increased calm and internal peace)<sup>14,22,40</sup>; Direct action: By dealing with demands, defining one's priorities, values and goals in order to achieve them and practicing assertiveness, especially learning how to say "no"<sup>14,22</sup>;

Support-seeking: By asking others for support and assistance when needed (long-term relationships can be the most significant counterbalancing force for sustaining control over stressors, mainly family and especially spouse) and sharing/communicating thoughts and feelings with them<sup>14,20,22,40,42</sup>;

Situation mastery: By selecting appropriate behaviors and reactions in a stressful situation. In other words, meaning avoiding chaos and embarrassing situations, and mostly predicting possible crises and trying to avoid them<sup>14,22</sup>;

Adaptability: By keeping a flexibility in response to demands, implying a continuous search for alternatives, which is a feature very important in practicing a service profession such as anesthesiology<sup>14,20,22</sup>;

Time management: Comprises effectiveness as an organized and controlled response to stressful situations as well

as takes into account our priorities (is a combination of time spent with family and friends and time spent for the profession)<sup>14,22,40,42</sup>;

Nurturing our sense of humor, playfulness and silliness: Which establishes a mood or attitude that brings positive emotions, spontaneity and fun into any activity.<sup>14,22</sup>

If we take this goal, we can achieve improvements in patient safety and doctors' quality of life.<sup>28</sup>

## Burnout prevention

The management of burnout should take into account a good prevention, which should involve a set of interventional measures either individually or in the workplace. The prevention of burnout can be divided into three groups: primary prevention (avoidance and removal of burnout factors), secondary prevention (early recognition and intervention) and tertiary prevention (coping with the consequences, rehabilitation and relapse prophylaxis).<sup>10</sup>

Primary prevention include measures to intervene at the level of human relations, workplace and work environment, as well as management measures, in order to improve the well-being; secondary prevention includes measures such as education and training of anesthesiologists; tertiary prevention includes a set of more specific and complex measures to reduce the impact of burnout, such as the creation and access to stepped up and specific health care.<sup>2,10</sup>

The burnout prevention strategies must include educational programs on burnout and stress management skills in the training of anesthesiologists, as well as organizational changes such as work redistribution, implementation of work breaks or prioritization of tasks are some examples.<sup>2,17,28</sup>

## The inconsistent research found in the state-of-art

In most studies, the burnout levels in anesthesiologists are consensual and predict a high to moderate value. Nonetheless, the discrepancy between cultures, the burnout prevalence among anesthesiologists, and health-care operators in general, is around 20% to 60%.<sup>43</sup> Nevertheless, the predominance of the three dimensions of burnout, used in MBI, differ between several studies. The impact of various risk factors varies between different studies.

### This inconsistency can be explained by several reasons, as follows

The range of scores to evaluate burnout and conditions, in which studies are carried out, challenge the comparison and interpretation of results difficult.

The working time varies among different countries. Countries with long periods of work in anesthesiology reflect higher levels of job dissatisfaction and, consequently, burnout. The workload differs between the specialties and, in general, surgeons are more affected by heavy workloads than anesthesiologists. However, in Finland, Portugal or Belgium, anesthesiologists work more heavy hours than surgeons.<sup>41</sup>

The health system differs among different countries, and the organization and working conditions, per se, are of

utmost importance that can directly influence the presentation of this condition – burnout.<sup>44</sup>

Another important factor in the assessment of job satisfaction is related to the remuneration. Thus, countries with higher wages are associated with higher satisfaction levels. If this stress factor is eliminated, then burnout will be reduced. The influence of the workplace as a stress factor and predictor of burnout remains controversial. Some studies have suggested that it has no impact in job satisfaction.<sup>45</sup> Other studies argue that anesthesiologists working in rural settings and smaller communities encounter unique stresses in terms of workloads, call and vacation coverage, professional relationships, isolation and educational opportunities.<sup>14,23,41</sup>

## Conclusion

Burnout is a very real condition in anesthesiology. Approximately 25% of anesthesiologists are at high risk of developing burnout, despite the variability inherent in several studies.<sup>30</sup> It can be caused by a variety of risk factors that trigger a negative response for own and for others, including the patient. It can be associated to a set of harmful complications ranging from medical malpractice to the anesthesiologist suicide. To relief it, burnout may be due to a medical culture grounded on principles like work overload, among other things. A good prevention is essential to avoid this condition.<sup>10</sup> The treatment process involves the application of a set of non-medical measures in order to eliminate stressors.<sup>10,31</sup>

In conclusion, there are few studies conducted on burnout in anesthesiologists. At the same time, there is some observed inconsistency across several studies. The establishment of organizations, that are able to avoid and identify it, represents a fundamental measure. Therefore, in the future, it would be interesting to reduce disparities found and to strength the correlation between risk factors and burnout complications, in order to identify measures to combat and prevent the severe consequences of burnout.

## Conflicts of interest

The authors declare no conflicts of interest.

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