Are Groote Schuur Hospital anaesthesiologists burnt out? A cross-sectional study of prevalence and risk

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Contents

Declaration

I, Michael Burger Groenewald, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor part of it has been, is being, or is to be submitted for another degree in University of Cape Town or any other university.

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Acknowledgements, format and contributions

Format and Referencing

- This dissertation will be based on the *Published Paper Format* as the thesis has already been published in the Southern African Journal of Anaesthesia and Analgesia (SAJAA) – *South Afr J Anaesth Analg 2020; 26(3)* - a journal that is listed in the citation index of the Institute for Scientific Information (ISI) and/or accredited by the Department of Education.
- The manuscript for publication was submitted to SAJAA as a Microsoft Word document. The text was 1,5-spaced, in 12-point Times New Roman font.
- All references were listed at the end of the journal article in numerical order of appearance in the *Vancouver Referencing style*.
- For a full review of SAJAA's 'Instruction to Authors', please refer to Appendix D

Contributions

The authors confirm that all authors have made substantial contributions to all of the following:

- The conception and design of the study, or acquisition of data, or analysis and interpretation of data.
- Drafting the article or revising it critically for important intellectual content.
- Final approval of the version to be submitted.
- Sound scientific research practice.

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Abstract

Title: **Are Groote Schuur Hospital anaesthesiologists burnt out? A cross-sectional study of prevalence and risk**

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Background: Burnout and physician wellness are becoming increasingly topical. While some surveys have been performed with South African anaesthesiologists, these have been conducted in limited samples. While Burnout is often measured, there is a paucity of research on contributory risk and protective factors.

Method: A contextual, prospective, cross-sectional study was conducted. The Maslach Burnout Inventory-Human Services Survey (MBI-HSS) and the Areas of Work-Life Survey (AWS) were used to assess Burnout and contributory organizational risk factors amongst state-employed anaesthesiologists working at Groote Schuur Hospital.

Results: Out of a possible 127 members of staff (Medical officers, Registrars and Consultants), 81 responded with 75 completing the full survey (59% response rate). Only 4% of respondents were classified as “burnt out”, defined as scoring

high in all three domains of Burnout: High Emotional Exhaustion *and* Depersonalization *and* Low Personal Accomplishment. However, 67% of respondents scored high for at least one of the components of Burnout, indicating the majority of the respondents are *at risk* for developing clinically significant Burnout. The Areas of Work-Life survey showed that respondents found their workload inappropriate. However, responses for the categories of Control, Reward, Community, Fairness and Values were all in the acceptable range.

Conclusion: While the overall rate of Burnout was low, the majority of respondents were at risk of developing Burnout. High perceived workload appeared to be a particular contributory factor. Protection against Burnout in this group may be provided by a combination of few organisational risk factors together with feelings of personal accomplishment.

Keywords: Burnout, anaesthesiologists, emotional exhaustion, depersonalization, personal accomplishment

Chapter One: Introduction

Vocational psychology and in particular the development of Burnout has become increasingly topical in the medical field. Burnout is a syndrome realised by the trifecta of feeling *Emotionally Exhausted, Depersonalized* and *Unaccomplished* in one's occupational context.[14] The presence of these three individual feelings are not dichotomous in nature but rather scaled continuous variables giving rise to a spectrum of psychological responses to occupational demands ranging from fully *Engaged* to *Burnout*.[1,2]

The pathophysiology of Burnout Syndrome is complex and ill-defined, varying across professions resulting in several models being proposed. Collectively all of these models view Burnout as the final result of chronic unresolved stress due to inadequate personal coping strategies and/or occupational resources to deal with workplace demands, a person-work environment mis-fit and/or discrepancies between occupational expectations and reality.[1,2]

Chronic stress and negativism influence how we think, how we perceive colleagues and patients and it affects our ability to solve problems efficiently. Burnout reduces the quality of care and professionalism and increases the risk of medical errors. Burnout leads to decreased job satisfaction which contributes to high turnover, early retirement and loss of critical expertise which is especially important in resource-poor environments. Burnout has a detrimental effect on general physical health, may lead to headaches, sleep disturbances, substance abuse and even suicide.[3-7]

Promoting personal resilience by individually focussed strategies can increase the ability to cope with work demands but is far less effective at reducing Burnout than Organisational risk reduction strategies.[13] Creating a work environment which encourages optimal Work-Life balance is essential in reducing the prevalence of occupational Burnout and promoting overall wellness. Several organisational risk factors influencing Work-Life balance have been identified and are closely related to the development of Burnout Syndrome. These risk factors can be quantified, and focused organisational interventions can be implemented to address the specific problem areas identified.[8-10]

Anaesthesiologists are faced with prolonged periods of critical decision making, physical exhaustion and often emotional trauma. Increasing workloads coupled with limited resources are creating unprecedented levels of stress. These chronic stressors are often unresolved due to long working hours and poor work-life balance. This is especially true in training facilities where academic responsibilities are often met outside of working hours, eroding time needed for relaxation and individual resilience promoting strategies.[11,12]

Due to the wide range of Burnout reported in health care professionals worldwide, and the paucity of research amongst anaesthesiologists in South Africa we aimed to not only determine, primarily, the level of Burnout experienced but also, secondarily, the organizational risk factors contributing to Burnout at Groote Schuur Hospital Department of Anaesthesia.

We elected to view occupational Burnout not as a dichotomous state of being burnt out or not, but as a continuum of experiences ranging from Engagement to Burnout and to amalgamate this with the organisational risk factors driving these experiences. The hope is that in taking this approach, focused interventional strategies could be implemented in future to reduce the level of Burnout and also to identify those at risk, and in so doing prevent full-blown clinical Burnout from occurring.

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Are Groote Schuur Hospital anaesthesiologists burnt out? A cross-sectional study of prevalence and risk

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Are Groote Schuur Hospital anaesthesiologists burnt out? A cross-sectional study of prevalence and risk

Introduction

Anaesthetists in South Africa are faced with ever-increasing workloads, whilst limited human and financial resources generate unprecedented levels of stress both in and out of the workplace.[1,2] In the Western Cape of South Africa, trauma is common, often resulting in severe, life-threatening injuries requiring surgery. Anesthesiology trainees managing these patients are often faced with prolonged periods of critical decision making, physical exhaustion and emotional trauma in under-resourced hospitals at night and after hours.[1] Work-life balance, an essential component of managing stress, is further negatively impacted by academic responsibilities such as exam preparation and MMed requirements. [3,4] Sustained stress in people without adequate coping strategies may lead to Burnout Syndrome. [5]

Burnout syndrome is characterized by *exhaustion, depersonalization* and a *lack of personal accomplishment*. It is important to note that these three basic dimensions are concepts with broader application. Exhaustion can be described as "worn out, loss of energy, depletion, debilitation and fatigue"; Depersonalization as "cynicism, detachment from work, negative or inappropriate attitudes, irritability, withdrawal"; and Personal accomplishment as "inefficacy, reduced productivity or capability, low morale and inability to cope".[6] The pathogenesis of Burnout is complex and ill-defined and varies across professions. However, across professions, it involves the interplay between the work environment and its demands, together with personal, social and biological resources.[7]

There are multiple negative consequences of Burnout on both personal and comprehensive levels. Burnout has a detrimental effect on physical health[8–12], and adverse psychological consequences with reduced job satisfaction, increased broken relationships, substance abuse and suicide.[13] Burnout influences quality of care, increases the risk for medical errors and litigation and erodes professionalism. Patients' perceived quality of care is less in units where high levels of Burnout exist amongst staff.[14] Finally, Burnout may contribute to early retirement and loss of expertise which is especially important in resource-poor environments. [15]

The three interrelated dimensions of Burnout lead to several patterns within or on the scale between *Burnout* and *Engagement* and bring a clearer understanding of the work experience.[6] Latent profile

analysis by Leitner and Maslach have identified five distinct patterns on the Burnout continuum which might point more clearly to the causative factors leading to work Burnout or engagement (Text Box 1).[6]

Text Box 1: Five patterns of Burnout (Leitner and Maslach, 2016)

Engaged: Low scores in *Emotional Exhaustion* and *Depersonalization* and high score in *Personal Accomplishment*.

Overextended: High Score in *Emotional Exhaustion* only.

Disengaged: High Score in *Depersonalization* only.

Ineffective: Low score in *Personal Accomplishment* only.

Burnout: High scores in *Emotional Exhaustion* and *Depersonalization* and low score in *Personal Accomplishment*.

Studies in various South African medical professionals describe Burnout rates ranging from 8-31%. A 2013 study among Advanced Life Support Paramedics in Johannesburg showed a Burnout rate of 30%, whereas a 2017 study among rural doctors in the Western Cape showed high Burnout in 31% of participants.[16,17] A 2015 study at the University of the Witwatersrand found an overall Burnout rate of 21% amongst public service anaesthetists but only 8% among private-sector anaesthetists. [18]

The clinical practice of anesthesiology is associated with inherent difficulties and stressors which cannot necessarily be modified. [19,20] Healthy coping strategies and adequate social support remain the most important personal factors in buffering work-related chronic stress and strain and thus promoting resilience and reducing Burnout.[21] However, organizational factors of the work environment which can be modified to reduce stress have been identified. Six organizational risk factors have been identified in the work environment which, depending on how the person experiences these may lead to engagement or Burnout. (Text Box 2)

Text Box 2: Organizational risk factors contributing to or buffering Burnout[22]

Workload: The amount of work to be done in a given time.

Control: The opportunity to make choices and decisions, to solve problems, and to contribute to the fulfilment of responsibilities.

Reward: Recognition (financial or social) you receive for your contribution to the job.

Community: The quality of the social context in which you work.

Fairness: The extent to which the organization has consistent and equitable rules for everyone, or the quality of justice and respect at work.

Values: That what matters to you at work

The work experience is not a black and white construct of being burnt-out or not but a dynamic model ranging from being fully Engaged to Burnout. Organizations can identify the relative roles organizational risk factors play in Burnout, and thus take specific steps to address and improve the work environment, engagement with work and ultimately decrease levels of Burnout.[23]

Given the paucity of studies on the rates of Burnout in South African medical professionals, the wide range of Burnout reported, and the need to identify modifiable organizational risk factors which can be addressed to reduce risk of Burnout, we aimed to assess levels of Burnout and contributory organizational risk factors amongst state-employed anaesthesiologists working at Groote Schuur Hospital.

Methods

A contextual, prospective, cross-sectional study was conducted. The Maslach Burnout Inventory-Human Services Survey (MBI-HSS) was used in combination with the Areas of Work-Life Survey (AWS), both on a copyrighted Online Platform Mindgarden. The data were scored and interpreted according to standard methods using these tools developed by Leitner and Maslach. [6] Ethical approval was obtained from the University of Cape Town, Faculty of Health Sciences Human Research Ethics Committee (REC Ref: 617/2017) with the principles of the Declaration of Helsinki adhered to throughout.[24]

Sample

All 127 state-employed doctors practising anesthesiology at Groote Schuur Hospital Complex, were sent a personalized email invitation to complete the *MBI-HSS* and *AWS* on the online platform. All doctors were registered with the Health Professions Council of South Africa as Independent Medical Practitioners or Medical Specialists at the time of enrolment. Doctors were either Medical Officers, Registrars at varied levels of completing specialist training, or Medical Specialists. Doctors who declined to participate in the study were excluded. No other exclusion criteria were applied.

Before completing the online survey, participants were required to complete Informed Consent. Subsequently, monthly follow up emails to invite participation were sent to non-responders for five months.

Measurement instruments

Maslach Burnout Inventory-Human Services Survey[25]

The MBI-HSS is a 22-Item survey designed to assess the three components of Burnout: Emotional Exhaustion (EE) - nine items; Depersonalisation (DP) - five items; and Lack of Personal Accomplishment (PA) - eight items. The sum of the component scores of the three constructs of Burnout is determined numerically and graded as either High, Moderate or Low. (Table I)

Table I: Classification of Components of Burnout

	High	**Moderate**	**Low**
Emotional Exhaustion	≥ 27	26-19	≤ 18
Depersonalization	≥ 10	9-6	≤ 5
Personal Accomplishment	≤ 33	34-39	≥ 40

Burnout Profiles

Five Burnout profiles have been identified on the Burnout continuum correlating with the different work experiences of employees. Two profiles score consistently across all three Burnout scales and these are *Burnout* and *Engaged*, three one-dimension profiles are identified for inconsistent scores: *Ineffective, Overextended* and *Disengaged.* (Table II)

Table II: Burnout Profiles

	Emotional Exhaustion	**Depersonalization**	**Personal Accomplishment**
Engaged	Low	Low	High
Ineffective	Low to Moderate	Low to Moderate	Low
Overextended	High	Low to Moderate	Low to Moderate
Disengaged	Low to Moderate	High	Low to Moderate
Burnout	High	High	Low

An *Engaged* individual will have a positive work experience scoring low on exhaustion and depersonalization and high on personal accomplishment. *Burnout* is realized when there are high exhaustion and depersonalization scores and low personal accomplishment. Three one-dimension patterns emerge; *Overextended*, where there is only high exhaustion, *Disengagement* with only high depersonalization and *Ineffective* with only low personal accomplishment. [6]

Areas of Work-Life Survey[22]

The Areas of Work-Life Survey includes 28 questions relating to the six areas of Work-Life on which participants indicate the extent to which their experience aligns with their expectations or aspirations for work. (Textbox 2) All items are rated on a 5-point Likert Scale measuring level of agreement. Items are worded as statements of perceived congruence or incongruence between oneself and the job. Items were assigned numerical values in descending order with a level of agreement ranging from Strongly Agree to Strongly Disagree, 5 to 1, with high scores (> 3) indicating a better degree of congruence, lower scores (<3) indicating greater incongruence

between the person and the organisation. For each area, an average is calculated with reverse scoring applied where applicable.

Statistical Analysis

Results are summarised in frequency tables as number (percentage). Statistica version 13.5.0.17 was used to do statistical analysis.[26] Differences in the distribution of *Emotional Exhaustion*, *Depersonalization* and *Personal Accomplishment* by gender and position were analysed via non-parametric methods using the Spearman's Rank Correlation Coefficient with significance accepted at $p<0.05$.

Data collected via the Areas of Work-Life survey were treated as non-parametric variables and described as medians, and interquartile ranges to indicate variability. The independent variables were grouped by position with the dependant variables being tested Workload, Control, Reward, Community, Fairness and Values. Hypothesis testing was done using non-parametric methods: Kruskal-Wallis tests were used to determine differences between groups and differences in distribution were determined by Spearman's Rank Correlation Coefficient. Significance was accepted at $p<0.05$ throughout.

Results

The survey had a 59% response rate with 75 members of staff completing the full survey. Characteristics of the respondents are presented in Table III.

Table III. Respondent Characteristics (n=75)

	n (%)
Gender	
Male	33 (44)
Female	42 (56)
Employment status	
Full time	71 (95)
Part-time	4 (5)

Position	
Medical Officer	4 (5)
Junior Registrar	15 (20)
Senior Registrar	23 (31)
Junior Consultant	13 (17)
Senior Consultant	20 (27)

On the MBI-HSS, the participants' median score for *Emotional Exhaustion* was High [29 (IQR: 22-35)]. For *Depersonalization*, the participants' median score was Moderate [9 (IQR: 5-15)] and the *Personal Accomplishment* Score was Moderate [35 (IQR: 29-39)]. Analysis of the components of Burnout by gender revealed that the female respondents were at higher risk of Emotional Exhaustion with more classified as high and moderate risk (Table IV).

Table IV. Distribution of Male vs Female respondents scoring High, Moderate and Low for each of the components of Burnout (*n=75*)

	Emotional Exhaustion High n (%) 	**Emotional Exhaustion Moderate n (%)** 	**Emotion Exhaustion Low n (%)** 	**Statistical Test**
Female	29 (69)	7 (17)	6 (14)	Spearman
Male	16 (49)	13 (39)	4 (12)	R=0.24; p=0.04*
	Depersonalisation High n (%)	**Depersonalisation Moderate n (%)**	**Depersonalisation Low n (%)**	

				
Female	22 (52)	7 (17)	13 (31)	Spearman
Male	14 (43)	8 (24)	11 (33)	R=0.075; p=0.52
	Personal Accomplishment High **n (%)** 	**Personal Accomplishment Moderate** **n (%)** 	**Personal Accomplishment Low** **n (%)** 	
Female	22 (52)	13 (31)	7 (17)	Spearman
Male	11 (33)	12 (36)	10 (30)	R=0.05; p=0.67

* indicates significance at p<0.05

Emotional Exhaustion (EE) and Depersonalisation (DP) increases with severity as the score increases in contrast with lack of Personal Accomplishment (PA) which increases in severity as the score decreases.

We did not conduct an analysis of Burnout by employment status (full time vs part-time) due to the very small number of respondents (*n= 4*) who were working part-time.

Analysis of the components of Burnout by position revealed that for *Depersonalisation*, there were significant differences between positions with Registrars appearing particularly vulnerable. In the Senior Registrars group (*n=23*); 66% were reporting high levels of *Depersonalisation* whilst 60% of the Junior registrars reported high levels of Depersonalisation (Table V).

Table V. Distribution of respondents by position Scoring High, Moderate and Low for each of the components of Burnout (*n=75*).

	Emotional Exhaustion	**Emotional Exhaustion Moderate**	**Emotional Exhaustion**	**Statistical Test**

	High **n (%)** 	**n (%)** 	**Low** **n (%)** 	
TOTAL	45 (60)	20 (27)	10 (13)	
Medical Officer *(n= 4)*	1 (25)	0 (0)	3 (75)	Spearman R=0.18; p=0.13
Junior Registrar *(n= 15)*	9 (60)	5 (33)	1 (7)	
Senior Registrar *(n= 23)*	18 (78)	4 (18)	1 (4)	
Junior Consultant *(n= 13)*	5 (39)	6 (46)	2 (15)	
Senior Consultant *(n=20)*	12 (60)	5 (25)	3 (15)	
	Depersonalisation High **n (%)** 	**Depersonalisation Moderate** **n (%)** 	**Depersonalisation Low** **n (%)** 	
TOTAL	36 (48)	15 (20)	24 (32)	
Medical Officer *(n= 4)*	1 (25)	1 (25)	2 (50)	Spearman R=0.33; p=0.004*

Junior Registrar *(n= 15)*	9 (60)	2 (13)	4 (27)	
Senior Registrar *(n= 23)*	15 (66)	4 (17)	4 (17)	
Junior Consultant *(n= 13)*	5 (38)	5 (38)	3 (24)	
Senior Consultant *(n=20)*	6 (30)	3 (15)	11 (55)	
	Personal Accomplishment High **n (%)** 	**Personal Accomplishment Moderate** **n (%)** 	**Personal Accomplishment Low** **n (%)** 	
TOTAL	33 (44)	25 (33)	17 (23)	
Medical Officer *(n= 4)*	2 (50)	1 (25)	1 (25)	Spearman R=0.05; p=0.69
Junior Registrar *(n= 15)*	6 (40)	5 (33)	4 (27)	
Senior Registrar *(n= 23)*	11 (48)	8 (35)	4 (17)	

Junior Consultant *(n= 13)*	6 (46)	4 (31)	3 (23)	
Senior Consultant *(n= 20)*	8 (40)	7 (35)	5 (25)	

*indicates $p<0.05$

Emotional Exhaustion and Depersonalisation increases with severity as the score increases in contrast with lack of Personal Accomplishment which increases in severity as the score decreases.

Burnout Patterns

Respondents were classified according to the Burnout Profile Patterns suggested by Leitner and Maslach. According to this classification, 3 (4%) of the respondents were classified as *Burnout.* Nine of the respondents were *Overextended* (12%); nine were *Ineffective* (12%) and two were *Engaged* (3%), and four of the respondents were classified as *Disengaged* (5%) (Table VI). Forty-eight (64%) didn't meet the criteria for any specific profile. In 50 (67%) of the respondents, high risk for developing clinically significant burnout was seen with high *Emotional Exhaustion* and/or *Depersonalization.*

Table VI. Burnout Profile patterns of all respondents and by position

	Engaged n (%)	Ineffective n (%)	Overextended n (%)	Disengaged n (%)	Burnout n (%)	Unclassified n (%)
TOTAL *(n=75)*	2(3)	9(12)	9(12)	4(4)	3(4)	48(64)
Medical Officer *(n=4)*	0(0)	1(25)	0	1(25)	0	2(50)
Junior Registrar *(n=15)*	0	1(7)	2(13)	2(13)	2(13)	8(53)
Senior Registrar *(n=23)*	0	2(9)	2(9)	1(4)	1(4) *19(82)*	17(74)
Junior Consultant *(n=13)*	1(8)	4(31)	0	0	0 *5(38)*	8(62)
Senior Consultant *(n=20)*	1(5)	2(10)	5(25)	0	0 *12(60)*	12(60)

Areas of Work-Life Survey - Organisational Risk Factors

Overall, the respondents' perception of the appropriateness of workload was poor with a median score of 2.2 (IQR1.8-2.6) (Table VII). However, the responses for the categories of Control, Reward, Community, Fairness and Values were all in the acceptable range.

Analysis of differences in the perception of *Workload* by position (i.e. junior vs senior doctors) revealed no differences between groups (p=0.17). For the perception of *Control*, there was a significant difference between groups with Consultants having a greater sense of control in Areas of Work-Life (p=0.0001).

There was no difference by position in the sense of *Reward* (p=0.24), the sense of *Community* (p=0.06), a sense of *Fairness* (p=0.68) or in the *Values* of the organisation (p=0.13)

Table VII. Responses to the Areas of Work-Life Survey by position

	Workload **Median (IQR)**	**Control** **Median (IQR)**	**Reward** **Median (IQR)**	**Community** **Median (IQR)**	**Fairness** **Median (IQR)**	**Values** **Median (IQR)**
All positions	2.2 (1.8-2.6)	3 (2.3-3.5)	3.3 (2.5-4)	3.6 (3.2-4)	2.7 (2.2-3.3)	3.5 (3.3-4)
Medical Officer *(n= 4)*	2.9 (2-3.4)	2.8 (2.15-3.4)	3.9 (3.15-4)	3.55 (3-4.1)	2.73 (2.1-3.35)	3.95 (3.75-4.15)
Junior Registrar *(n= 15)*	2.4 (2-2.8)	2.8 (2.3-3.3)	2.8 (2-3.5)	3.2 (2.6-4)	3.2 (2.3-3.5)	3.5 (3.3-4)
Senior Registrar *(n=23)*	2.2 (1.8-2.4)	2.5 (2-2.8)	3.3 (2.5-3.8)	3.2 (3-3.6)	2.5 (2-3.3)	3.5 (2.8-4)
Junior Consultant *(n=13)*	2 (1.6-2.2)	3.3 (2.5-3.5)	3.3 (2.5-4)	3.6 (3.6-4)	2.5 (2.5-2.8)	3.3 (3-3.8)
Senior Consultant *(n= 20)*	2.1 (1.7-2.4)	3.65 (3.15-4)	3.4 (3-4)	3.7 (3.2-4)	2.95 (1.75-3.7)	3.8 (3.5-4)

Association between Burnout and Organisational Risk Factors

Analysis of association between the *Burnout* profile and the individual Organisational Risk Factors of the AWS showed no association between the *Burnout* profile and any of the Areas of Work-Life components.

Discussion

This study aimed to not only identify the levels of Burnout in a cohort of anaesthetists working at Groote Schuur Hospital, but also the possible modifiable Organizational Risk Factors as measured by the Areas of Work-Life Survey, which have previously been associated with Burnout.

Although only four percent of respondents were classified as having *Burnout*, markedly lower than any other recent South African study, 67% scored high for at least one of the components of Burnout placing the majority of the respondents at risk of developing clinically significant Burnout. A possible protective factor in this cohort was *Personal Accomplishment*. The majority of respondents (68%) reported high to moderate levels of *Personal Accomplishment* potentially reducing the overall rate of *Burnout* compared with other studies. (Table VIII)

Table VIII: Percentage of participants with high levels of the three dimensions of Burnout in different cohorts of anaesthetists[18]

	Groote Schuur (current study)	**Gauteng RSA**[18]	**Portugal**[27]	**Australia**[28]	**USA**[29]	**Romania**[30]
% High Emotional Exhaustion	60	45	58	20	30	34
% High Depersonalization	48	50	91	20	10.5	38
% Low Personal Accomplishment	17	46	45	36	7	38

Worrisome in the current study is that 69% of female respondents scored high for *Emotional Exhaustion* compared to only 49% of male respondents. It appears that females may be especially vulnerable to developing *Emotional Exhaustion,* a finding in keeping with the results from a study at Wits University.[18]

The increased risk for *Emotional Exhaustion* in females has been attributed to multiple factors. These include females being excluded from decision making positions; females' skills being overlooked and not utilised; and family responsibilities falling heavily on women which may make work-life balance especially difficult.[31,32]

Inappropriate Workload was the most significant risk factor in the Areas of Work-Life survey with a median score of 2.2(IQR 1.8-2.6). *Inappropriate Workload* has been identified as having a strong connection with *Emotional Exhaustion*, accounting for the majority of respondents being classified as *Overextended* (12%), a profile singularly concerned with work demands.[6]

Of concern is that high *Depersonalization* was observed in the majority of registrars (60-66%), significantly higher than the consultant group (30-38%, p=0.004). This suggests a vulnerability in the social context in which registrars operate as *depersonalisation* is well correlated with organizational values, emotional and social connections and the overall work environment and teamwork.[6] In this study the perception of *Control*, as measured by the Areas of Work-Life Survey, over the work environment was significantly lower in the registrar group (2.5-2.8) compared to the consultant group (3.3-3.65)(p=0.0001). The lower perception of control could account for the high levels of *Depersonalization* among the registrars. This pattern is similar to that reported at Wits University where a trend towards higher overall Burnout scores was observed in the registrars compared to the consultants. The vulnerability of registrars or trainees has also been echoed in several other international studies in training institutions.[18,33,34]

Recommendations

A healthy work environment is essential to promote wellbeing and reduce the risk of Burnout.[32] While individually focused strategies like mindfulness, exercise, meditation etc. can be encouraged and are known to promote resilience in individuals by strengthening the ability to cope with work demands, Organizational Strategies are far superior in reducing the overall risk of Burnout.[35] Based on the results of this study, two *Organizational Risk Factors* can be targeted to reduce the risk of Burnout. These are *Workload* and the perception of *Control*, particularly among registrars. Numerous strategies which have been found to effectively address these risk factors are summarised in Table IX.

Table IX: Strategies to lessen Workload and promote Control[17]

Workload	Decrease clerical load[36–38] Reduction of the frustration of clinicians with regards to equipment, resources and staffing[37,38] Locum or contract posts during periods of annual leave or maternity leave[36] Appointing appropriate staff numbers[36]
Control	Autonomy in planning working schedules and working hours[37–41] Allowing clinicians to plan their leave[37,40] Use of flexible working hours according to peak patient load[37,40,41]

Limitations

There are several limitations to this study. Firstly, the limited sample means the results are not generalisable. However, we believe identifying the particular risk in trainees in this cohort and identifying organizational strategies to mitigate these risks may be transferable to other settings.

It must be noted that due to the sensitive nature of the questionnaire, respondents may have been reluctant to participate in the survey introducing a risk of recruitment bias skewing the results. While the anonymous nature of the survey aimed to reduce this risk, the possibility of reprisal from managerial staff may have been a concern for some.

There still exists great disagreement on the definition of Burnout among researchers with many studies using single dimension constructs like *Emotional Exhaustion* alone as a proxy to define the Burnout Syndrome making comparisons difficult if not impossible.[42,43] We have elected to use all three dimensions in classifying a person as *Burnout* as per the original construct by Leitner and Maslach. Being burnt out is a much more negative experience of the Work-Life environment than just being *Emotionally Exhausted*, furthermore, the *Disengaged* Profile (high on Depersonalization only) is also

more negative on many important Work-Life aspects than the *Overextended* Profile (high on Emotional Exhaustion only), pointing to the critical role *Depersonalization* plays in the syndrome.[6]

Conclusion

Despite a small percentage of respondents meeting the criteria for *Burnout* in the department surveyed, a significant percentage were at risk of becoming burnt-out. A specific overall area of concern identified in the work environment is excessive *Workload*.

The registrar population appear to be particularly at risk of developing Burnout with a low perception of *Control* being a possible driving risk factor. Apart from addressing the excessive workload, interventions aiming to improve the social context of the work environment with a focus on autonomy in planning working schedules should be implemented to mitigate risk in this group.

It was gratifying to observe that a strong sense of personal accomplishment still exists in the respondents despite the strains on personal and organisational resources. Indeed, this sense of personal accomplishment may have reduced the incidence of *Burnout* in this cohort.

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Appendix A: Ethical Approval Letter

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E53-46 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6626
Email: shuretta.thomas@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

28 August 2017

HREC REF: 617/2017

Dr J Van Nugteren
Anaesthesiology and Perioperative Medicine
D23, NGSH

Dear Dr J Van Nugteren

PROJECT TITLE: BURNOUT AND CONTRIBUTORY ORGANIZATIONAL RISK FACTORS AMONGST STATE-EMPLOYED ANAESTHESIOLOGISTS IN THE CAPE METROPOLE OF SOUTH AFRICA- (MMed-candidate-Dr M Groenewald)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study subject to adding the HREC contact details to the informed consent form.

Approval is granted for one year until the 30 August 2018.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

The HREC acknowledge that the student, Dr Michael Burger Groenewald will also be involved in this study.

Yours sincerely

Signature removed

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938

Appendix B: Data Collection Documents

Consent Form

Informed consent

You are invited to participate in a web-based online survey on job-related stress affecting anaesthesiologists and the organizational factors that modulate this stress. This is a research project being conducted by Dr MB Groenewald, a student at the University of Cape Town, Department of Anaesthesia and Perioperative Medicine. It should take approximately 15 minutes to complete.

PARTICIPATIONYour participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without consequence. You are free to decline to answer any particular question that you do not wish to answer for any reason. Choosing to participate will not affect your job or job-related evaluations.

BENEFITS

You will receive no direct benefits from participating in this research study. However, your responses may help us to understand which organizational factors could be modified to increase job satisfaction and reduce stress at work.

RISKS

There is the risk that reflecting on some questions may cause emotional discomfort. If you at any point feel distressed, you may exit the survey and complete it at a later time. The Western Cape Department of Health has a Staff Health and Wellness Programme who offers counselling. This is a 24 hour per day, 365 days per year service and can be contacted via this Toll- Free number: 0800 611 093.

CONFIDENTIALITY

Only anonymized data will be recorded by Transform Survey Hosting (the site which hosts the questionnaire which we will be using). The data will be kept on password-protected computers. Participant's confidentiality will be protected and maintained. The Chief Investigator is the custodian of

the data and only the lead investigators will have access to the data. Therefore, your responses will remain anonymous. No one will be able to identify you or your answers.

CONTACT

If you have questions at any time about the study, you may contact me via my cell phone at 0837233554 or via email at embegroenewald@gmail.com or my research supervisor, Dr Janieke van Nugteren via cell phone at 082 6660874 or via email at janieke1976@gmail.com

If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honoured during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigators, you may contact the Human Research Committee at the University of Cape Town, E53 Room 46, Old Main Building, Groote Schuur Hospital, email address: nosi.tsama@uct.ac.za .

ELECTRONIC CONSENT: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the "Agree" button indicates that

- You have read the above information
- You voluntarily agree to participate
- You are 18 years of age or older

☐ Agree

☐ Disagree

Demographic Information

1. Gender
    a. Male
    b. Female

2. How long have you worked at this organization?
    a. 0-6 months to more than 21 years

3. How long have you worked in your present position in this Organization?

4. Your employment status?
    a. Full-time
    b. Part-time

5. Position in department?
    a. Medical Officer
    b. Junior Registrar
    c. Senior Registrar
    d. Junior Consultant
    e. Senior Consultant

Questionnaire/Data capture instruments

Areas of Work-Life Survey

Please use the following rating scale to indicate the extent to which you agree with the following statements.

Please circle the number corresponding to your answer.

1	2	3	4	5
Strongly Disagree	**Disagree**	**Hard to Decide**	**Agree**	**Strongly Agree**

	Strongly Disagree	Disagree	Hard to Decide	Agree	Strongly Agree
Workload					
1. I do not have time to do the work that must be done.	1	2	3	4	5
2. I work intensely for prolonged periods of time.	1	2	3	4	5
3. I have so much work to do on the job that it takes me away from my personal interests.	1	2	3	4	5
4. I have enough time to do what's important in my job.	1	2	3	4	5
5. I leave my work behind when I go home at the end of the workday.	1	2	3	4	5
Control					
6. I have control over how I do my work.	1	2	3	4	5
7. I can influence management to obtain the equipment and space I need for my work.	1	2	3	4	5
8. I have professional autonomy /independence in my work.	1	2	3	4	5
9. I have influence in the decisions affecting my work.	1	2	3	4	5
Reward					
10. I receive recognition from others for my work.	1	2	3	4	5
11. My work is appreciated.	1	2	3	4	5
12. My efforts usually go unnoticed.	1	2	3	4	5
13. I do not get recognized for all the things I contribute.	1	2	3	4	5

Community	Strongly Disagree	Disagree	Hard to Decide	Agree	Strongly Agree
14. People trust one another to fulfil their roles.	1	2	3	4	5
15. I am a member of a supportive workgroup.	1	2	3	4	5
16. Members of my workgroup cooperate with one another.	1	2	3	4	5
17. Members of my workgroup communicate openly.	1	2	3	4	5
18. I don't feel close to my colleagues.	1	2	3	4	5
Fairness					
19. Resources are allocated fairly here.	1	2	3	4	5
20. Opportunities are decided solely on merit.	1	2	3	4	5
21. There are effective appeal procedures available when I question the fairness of a decision.	1	2	3	4	5
22. Management treats all employees fairly.	1	2	3	4	5
23. Favoritism determines how decisions are made at work.	1	2	3	4	5
24. It's not what you know but who you know that determines a career here.	1	2	3	4	5
Values					
25. My values and the Organization's values are alike.	1	2	3	4	5
26. The Organization's goals influence my day to day work activities.	1	2	3	4	5
27. My personal career goals are consistent with the Organization's stated goals.	1	2	3	4	5
28. The Organization is committed to quality.	1	2	3	4	5

Maslach Burnout Inventory-Human Services Survey

Review Copy: MBI Human Services Survey

How often:	0	1	2	3	4	5	6
	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

How often 0-6	Statements:
1. _____	I feel emotionally drained from my work.
2. _____	I feel used up at the end of the workday.
3. _____	I feel fatigued when I get up in the morning and have to face another day on the job.
4. _____	I can easily understand how my recipients feel about things.
5. _____	I feel I treat some recipients as if they were impersonal objects.
6. _____	Working with people all day is really a strain for me.
7. _____	I deal very effectively with the problems of my recipients.
8. _____	I feel burned out from my work.
9. _____	I feel I'm positively influencing other people's lives through my work.
10. _____	I've become more callous toward people since I took this job.
11. _____	I worry that this job is hardening me emotionally.
12. _____	I feel very energetic.
13. _____	I feel frustrated by my job.
14. _____	I feel I'm working too hard on my job.
15. _____	I don't really care what happens to some recipients.
16. _____	Working with people directly puts too much stress on me.
17. _____	I can easily create a relaxed atmosphere with my recipients.
18. _____	I feel exhilarated after working closely with my recipients.
19. _____	I have accomplished many worthwhile things in this job.
20. _____	I feel like I'm at the end of my rope.
21. _____	In my work, I deal with emotional problems very calmly.
22. _____	I feel recipients blame me for some of their problems.

(Administrative use only)

EE: _____ **DP:** _____ **PA:** _____

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Appendix C: Reviewer comments

Editor's Response:

Michael Burger Groenewald, Janieke Van Nugteren, Romy Parker:

Thank you for your revised manuscript entitled "Are Groote Schuur Hospital anaesthesiologists burnt out? A cross-sectional study of prevalence and risk" which has been accepted for publication. You will be contacted by our proof reader, in due course, to finalise the editing of the manuscript.

Thank you for supporting the South African Journal Anaesthesia and Analgesia.

Yours sincerely
Prof E Oosthuizen
Section Editor: SA Journal of Anaesthesia and Analgesia

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The article was published as submitted without requiring corrections.

Appendix D: Letter to the editor and response regarding Article:

LETTER TO THE EDITOR

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Are Groote Schuur Hospital anaesthesiologists burnt out?

I read with interest the paper by Groenewald and colleagues, who studied the prevalence of the burnout syndrome among anaesthetists working in the Groote Schuur Hospital.[1] Having ourselves published a burnout survey among SASA members, involving 498 respondents in a previous issue of the SAJAA,[2] we are particularly interested in comparing the findings of the two studies. Fortunately, both studies employed identical survey instruments and the same cut-off thresholds for classifying scores into high, moderate and low score categories. However, we should bear in mind that our survey preceded that of Groenewald and coworkers. Thus certain Groote Schuur anaesthetists may have participated in both studies, and statistical comparisons will be invalid.

In their study[1] Groenewald and coworkers categorised their participants according to the profiles of Leiter and Maslach.[3] These authors postulated that persons subjected to various workplace stresses and mismatches may develop different manifestations of the burnout syndrome along a continuum between engagement and full-fledged burnout, and that there may be latent symptoms that would serve as early warning signs. Using a technique of latent profile analysis, they conducted two studies among healthcare workers involving 1 766 and 1 166 participants.[3] Their analysis resulted in five profiles:

1. Burnout, also termed "severe burnout":[3] high scores for all three burnout dimensions; emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA)
2. Disengaged: high DP, moderate other
3. Overextended: high EE, moderate other
4. Ineffective: low PA moderate other
5. Engaged: low scores for all three burnout dimensions.

For clinical purposes there is a need for a method by which to reach a dichotomous clinical diagnosis of burnout, especially considering that in several European countries, burnout warrants sick leave (ICD-10 code Z73.0). Brenninkmeijer and Van Yperen proposed the "EE+1" principle, whereby a person can be diagnosed as being clinically burnt out if he/she has a high score for EE plus either a high DP score or a low PA score.[4] The authors of the Maslach Burnout Inventory concur that the "EE+1" rule[4] defines a psychological state of sufficient severity that justifies a clinical diagnosis of burnout.[5,6] We therefore identified in our analysis those participants who would be diagnosed as being clinically burnt out according to the "EE+1" rule. In addition, we defined "extreme burnout" as high scores for all three burnout dimensions.

Groenewald and coworkers conclude that the overall burnout prevalence was low among Groote Schuur anaesthetists. However, their definition of burnout coincides with the category "extreme burnout" in our study. We undertook a further analysis of our data by categorising our respondents' scores according to the Leiter and Maslach classification. The results are presented in Table I.

Table I: Comparison of burnout-engagement profiles between two studies of burnout among South African anaesthetists

	Groenewald et al.[1] % (95% CI)	Coetzee and Kluyts[2]		
		SASA % (95% CI)	Public sector % (95% CI)	Private sector % (95% CI)
Sample size	75	498	189	309
Severe burnout†	4.0 (1.4 to 11.1)	10.6 (8.2 to 13.7)	17.5 (12.7 to 33.5)	6.5 (4.2 to 9.8)
Engaged†	2.7 (0.7 to 9.2)	21.7 (18.3 to 29.5)	11.1 (4.4 to 16.4)	28.2 (23.4 to 33.4)
Overextended†	12.0 (6.4 to 21.3)	9.6 (7.3 to 12.5)	12.2 (8.2 to 17.6)	8.1 (5.5 to 11.7)
Disengaged†	5.3 (2.1 to 12.9)	4.6 (3.1 to 6.8)	5.3 (2.9 to 9.5)	4.2 (2.5 to 7.1)
Ineffective†	12.0 (6.4 to 21.3)	14.3 (11.5 to 17.6)	11.6 (7.8 to 17.0)	15.9 (12.2 to 20.3)
Clinical diagnosis of burnout		22.7 (19.2 to 26.6)	36.5 (30.0 to 43.6)	14.2 (10.9 to 18.6)
Unclassified respondents	64.0 (52.7 to 73.9)	39.2 (35.0 to 43.5)	42.3 (35.5 to 49.5)	37.2 (32.0 to 42.7)
Clinical diagnosis among unclassified respondents		30.8 (24.7 to 37.6)	45 (34.6 to 55.9)	20.9 (14.4 to 29.2)

† Profiling along the burnout-engagement scale, according to the principles of Leiter and Maslach[3]
Severe burnout – high scores for the emotional exhaustion (EE) and depersonalisation (DP) burnout dimensions, plus a low score for personal accomplishment (PA)

Engaged – low scores for EE and DP, plus a high score for PA
Overextended – high score for EE only
Disengaged – high score for DP only
Ineffective – low score for PA only
Clinical diagnosis of burnout according to the "EE+1" principle, i.e. a high score for EE plus either a high score for DP or a low score for PA[4]
Unclassified – respondents who could not be profiled according to the principles of Leiter and Maslach[3]
Clinical diagnosis among unclassified respondents – unclassified respondents who met the criteria for a clinical diagnosis of burnout according to the "EE+1" principle
Synonyms – depersonalisation/cynicism, personal accomplishment/efficacy

On examining the prevalences and their 95% confidence intervals in Table I, the overextended, disengaged and ineffective profile prevalences appear to be similar between the two studies. The prevalence of severe burnout among our public sector respondents appears to be greater than that of Groote Schuur. The prevalence of engaged profiles among our private sector respondents appears to be greater than that of the public sector which in turn seems to be greater than that of the Groote Schuur anaesthetists. About 40% of our SASA study respondents could not be profiled, however 21–45% of these unclassified respondents fell into the category of being clinically burnt out. Considering that in the Groote Schuur study 64% could not be profiled, it would be interesting to investigate firstly what proportion of Groote Schuur anaesthetists could have been diagnosed as being clinically burnt out according to the "EE+1" rule, and secondly what proportion of those unclassified were clinically burnt out.

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Conflict of interest

The author declares no conflict of interest.

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Response to Professor J Coetzee's Letter to the Editor, SAJAA

Are Groote Schuur Hospital anaesthesiologists burnt out?

We thank Professor Jeff Coetzee, an expert in the field of Occupational Burnout, for his interest in our work on the prevalence of burnout amongst anaesthesiologists at Groote Schuur Hospital and welcome this opportunity to further discuss the implications of our study.

As Prof. Coetzee rightly points out, and as we raised in our paper, there is ongoing debate as to the definition of burnout, with some studies using single dimension constructs such as emotional exhaustion alone as a proxy to define burnout syndrome.[1] The range of methods used to define burnout make comparisons difficult, if not impossible, as highlighted in our paper and in the communication from Prof. Coetzee. In our work, we chose to retain Maslach's original three-dimensional construct of burnout including emotional exhaustion (EE), depersonalisation and personal accomplishment[2] as opposed to the simplified validated method of EE+1 to which Prof. Coetzee refers. We believe that while the EE+1 approach has validity as a simple method to dichotomise respondents into two groups with or without burnout, that this approach risks being maladroit. The EE+1 approach does not account for factors which may contribute to an individual's resilience to burnout. For example, if the EE+1 is calculated using EE plus high levels of depersonalisation, the potential buffering effect of personal accomplishment is not accounted for. Similarly, if the EE+1 is calculated using low levels of personal accomplishment, the protective effects of low levels of depersonalisation are not accounted for. By retaining the three-dimensional construct of burnout in our work, it has enabled us to explore the finer nuanced emotional conditions on the scale ranging from being engaged to being burnt out.

We have applied the EE+1 method to our results to allow comparison with those of Prof. Coetzee. We believe that comparing the results of the EE+1 analysis with the full range of emotional conditions lends further support to our approach (Table I). Using the EE+1 method, our cohort presents with a markedly different and concerningly high prevalence of burnout (46%) compared with the 4% presenting with burnout using the full profile method. Although the full profile method gives a surprisingly low prevalence of burnout, we raised our concerns in the paper about the high prevalence of at-risk individuals (individuals who are classified as burnt out using the EE+1 method). We believe it is of critical importance to look and explore the factors that, in our opinion, may have buffered these at-risk individuals against full blown burnout, for in that lies the route to being able to make an impact.

We believe that classifying people as burnt out is arguably not sufficient to enable us to make a difference in this population. We analysed our data set with the full range of profiles with the aim of initiating discussion on how to intervene and improve the working environment and lives of our doctors. By identifying at-risk individuals and exploring factors which may contribute to resilience, this is hopefully possible. This method, combined with the results from the Areas of Worklife Survey,[3] affords the ability to implement goal directed interventions in specific groups to make a real difference whilst maintaining the workforce. This offers a more nuanced approach compared to the EE+1 method which risks significant numbers of staff being diagnosed with clinical burnout and potentially booked off sick, further increasing the workload on the remaining workforce.

We would like to highlight the high degree of personal accomplishment seen in our cohort. Using the full profile analysis, personal accomplishment greatly reduced the prevalence of burnout in our cohort. We argue that this cannot be discarded, as a sense of fulfilment or achievement is vital in the resilience arsenal, an aspect that can easily be dismissed using the EE+1 method and cautioned against by Brenninkmeijer and Van Yperen.[4]

While it is interesting to compare our results to those of Prof. J Coetzee using the EE+1 method in our exploration of this serious occupational phenomenon, we believe there is value in retaining Maslach's original range of profiles to facilitate engagement with both protective and vulnerability factors as we move towards addressing the problem rather than merely describing it.

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Appendix

Table I: EE+1 Method

Profile	Number	Percentage
Engaged	2	3
Ineffective	9	12
Overextended	9	12
Disengaged	4	4
Burnout (classic/extreme)	3	4
Unclassified	48	64
EE+1 PROFILES		
EE+1 burnout (n = 71)	35	46
Registrars (n = 38)	22	57
Consultants (n = 33)	13	40
Unclassified with EE+1 burnout (n = 48)	27	56

Appendix E: SAJAA Author Guidelines

AUTHORSHIP

Named authors must consent to publication **by signing a covering letter** which should be submitted as a supplementary file. Authorship should be based on substantial contribution to:
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(iv) exact contribution of each author must be stated.

DECLARATION OF CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute a conflict of interest. If there is no conflict of interest to declare please include the following statement: The authors declare no conflict of interest.

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All sources of funding should be declared. Also define the involvement of study sponsors in the study design, collection, analysis and interpretation of data; the writing of the manuscript; the decision to submit the manuscript for publication. If the study sponsors had no such involvement, this should be stated as follows: No funding source to be declared.

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The submitting author must provide written confirmation of Research Ethics Committee approval for all studies including case reports. The ethics committee as well as the approval number should be included.

STATISTICAL ANALYSIS

Authors are advised to involve medical statisticians at the protocol stage of their research project: to plan sample size and the selection of appropriate statistical tests for analysis and presentation.

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Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to **www.icmje.org**.

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The rationale for analysis based on racio-ethnic-cultural categorisation should be indicated.

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Shorter items are more likely to be accepted for publication, owing to space constraints and reader preferences.

Original articles

Original articles on research relevant to anaesthesia and analgesia should not exceed 3 200 words, no more than 30 references, with up to 6 tables or figures. A structured abstract under the following headings, Background, Methods, Results, and Conclusions is a requirement and should not exceed 300 words.

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Review articles relevant to anaesthesia and analgesia should not exceed 2 400 words, with a maximum of 20 references and no more than 6 tables or figures. A summary of 300 words or less is required.

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Case reports should not exceed 1 800 words with no more than 10 references. Figures are limited to 2 figures and may include images or photographs. The case report should have three headings: Summary (not exceeding 100 words), Case report (with no introduction) and Discussion. Case reports will be published online only. The summary and the URL will appear in the printed version.

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Scientific Letters should not exceed 2 400 words with a maximum of 10 references. Only one table or illustration is permissible. A structured abstract under the following headings, Background, Methods, Results, and Conclusions, is a requirement and should not exceed 250 words.

Letters to the editor

Letters to the editor should be 800 words or less with only one image or table.

MANUSCRIPT PREPARATION

Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - **www.icmje.org**. Manuscripts must be provided in **UK English**.

Qualification, affiliation and contact details

This information must be provided for ALL authors and must be submitted as a supplementary file.

Email addresses of all author must be provided.

ORCID number of **ALL** authors must be provided – if authors do not have ORCID, please register at https://orcid.org/

Abbreviations

All abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

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Scientific measurements must be expressed in SI units except blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be preceded by a space (except for %), e.g. '40 kg' and '20 cm' but '50%'. Greater/smaller than signs (> and 40 years of age) should also be preceded by a space e.g. > 20 years. No spaces should precede ± and °, i.e. '35±6' and '19°C'.

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Quotes should be placed in single quotation marks: i.e. The respondent stated: '...'

Round **brackets** (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

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Journal references:

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A covering letter to the editor is mandatory and must include statements that the manuscript has not been published previously and is not under review elsewhere. It should state details of any prior publication of the research in abstract form or in Congress proceedings. The letter must declare if any of the authors have a conflict of interest and that the requirements for submission, including ethics approval and patient permission for case reports have been fulfilled. All authors must sign the covering letter.

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NOTES

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- If you are requesting staff information, you are required to complete the HR Information Request Form (HR190) and submit it together with all the required documentation.
- The turnaround time for a reply is **approximately 10 working days unless specified as urgent.**
- Return the completed application form and all the above documentation to Joy Henry via email: joy.henry@uct.ac.za; or deliver to: For the Attention: Executive Director, Human Resources Department, Bremner Building, Room 214, Lower Campus, UCT.

SECTION A: APPLICANT DETAILS

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University or institution at which employed or a registered student	UCT		
Faculty or department in which you are registered or work	Department of Anaesthesia and Perioperative Medicine		
Address (if not UCT)	Groote Schuur Hospital		

SECTION B: SUPERVISOR DETAILS

	Title and name	Telephone number	Email address
Supervisor	Dr. J. van Nugteren	0826660974	janieke1976@gmail.com
Co-Supervisor	Prof. J. Cadzee	028-3121267	jfcesun.ac.za

SECTION C: APPLICANT'S FIELD OF STUDY (if applicable) / TITLE OF RESEARCH PROJECT / STUDY

Degree	MMed Anaesthesiology	
Research project or title	Please see attached Protocol – Burnout	
Research proposal attached	☑ Yes	☐ No
Target population (number of UCT staff)	Department of Anaesthesia ± 100	
Amount of time required for an interview and/or questionnaire	15 min	
Lead Researcher details	Dr. J. van Nugteren	
Proof of ethical clearance status attached	☑ Yes	☐ No

SECTION D: FOR OFFICE USE (Approval status to be completed by the Executive Director, Human Resources or Nominee)

Support or approval			Role	Signature	Date
Supported?	☑ Yes	☐ No	Joy Henry (Office Co-Ordinator)		4/9/2017
Approved?	☑ Yes	☐ No	Miriam Hoosain (Executive Director: HR)	Signature removed	1/9/17