

Harnessing Artificial intelligence to Address Burnout Symptomology in Regional Anesthesia and Pain Medicine Physicians

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Introduction

Anesthesiology is an exceptionally demanding field of medicine associated with high rates of physician burnout and dissatisfaction. Efforts to address burnout are ongoing, however the underlying causes of burnout are frequently poorly understood and those practicing **regional anesthesia** and **pain management** may be at elevated risk for burnout symptomology.

Objectives

For any given hypothetical anesthesiologist life situations, assess the ability of ChatGPT to identify:

- **Burnout risk factors**
- **Remediation strategies**
- **Additional life stressors**

Methods

Seven hypothetical healthcare professional scenarios were constructed that included an array of risk factors associated with anesthesiologist burnout according to recent literature (Afonso et. al.). ChatGPT 4o (OpenAI, Inc. San Francisco, CA, US). was presented with a prompt that asked for the identification of risk factors for burnout and the creation of a 10-step plan for burnout mediation that included interventions at the individual and institutional levels.



Risk Factors	Stressors
• Perceived lack of support at work • Staffing shortages • Working more than 40 hours per week • Low support at home • Less time since completion of training	• Presence of children • Being a new parent • Multiple career responsibilities • Large debt burden • Being sued/recent adverse events • Sandwich generation • New medical illness • Unhealthy living
Effective Interventions	
• Adequate anesthesia staffing • Improved workplace morale or culture • Increased Compensation • Reduced weekly hours • Increasing schedule flexibility • Improved support from leadership	

Figure 1: Risk factors correlating with burnout and effective interventions for burnout as described by literature¹ and additional life stressors included in prompts.

Data Analysis

Risk factors identified by the LLM that correlated with burnout symptomology in published literature were recorded and compared to AI identified factors. The percentage of additional life stressors identified by the LLM was evaluated. Remediation plans proposed by the LLM were compared to remediation plans proposed in peer-reviewed literature.

Results



Figure 2: Number of significant vs insignificant risk factors and interventions identified by the chatbot

- **94%** of risk factors in prompts were identified
- **40%** of risk factors identified were significant in literature (fig. 2)
- **41%** of interventions were significant in literature (fig. 2)
- **100%** of the additional stressors were correctly identified

The only risk factor missed by the LLM was the recent completion of residency training. The LLM also identified increasing age as a risk factor, however literature has shown that this is more of a protective factor against burnout.

Conclusions

- ChatGPT correctly identified nearly all risk factors associated with burnout, appearing to function as a **sensitive** screening tool.
- Many additional factors and interventions with unknown burnout correlations were identified.
- Burnout risk assessment requires additional research, but there may be a role for LLMs in identifying these risk factors and developing strategies that result in wellness improvement.
- Future directions: Evaluate multiple LLMs and their performance under an increased array of scenarios

References

1. Afonso, A.M.; Cadwell, J.B.; Staffa, S.J.; Sinskey, J.L.; Vinson, A.E. *U.S. Attending Anesthesiologist Burnout in the Postpandemic Era*. *Anesthesiology* 140(1):p 38-51, January 2024.