

## Psychological factors and surgical outcomes

Several psychological factors, including anxiety and depression, are associated with poor surgical outcomes, likely as a result of chronic dysfunction of the hypothalamic–pituitary–adrenal axis. However, despite some encouraging results, a lack of high-quality studies means that there is limited evidence to support the use of psychological interventions to improve surgical outcomes.

There is increasing awareness of the importance of psychological factors in the perioperative period, with evidence suggesting impacts on both short-term postoperative outcomes and long-term morbidity (Levett and Grimmett, 2019). Accordingly, the role of psychological interventions in improving postoperative outcomes has been an area of growing interest in recent years.

### Mental health and immune dysfunction

Mental health and immune dysfunction are closely linked: first, chronic inflammation is implicated in the pathophysiology of several psychiatric conditions, including anxiety, depression and schizophrenia. Second, both psychiatric illness and psychological stress are associated with dysregulation of the hypothalamic–pituitary–adrenal axis, resulting in increased plasma cortisol levels, systemic inflammation and impaired immunity (Alessi and Bennett, 2020).

After surgery, activation of the hypothalamic–pituitary–adrenal axis is key to the development of the stress response, that is characterised by predictable neuroendocrine, metabolic and immunological changes. While the stress response is an important physiological adaptation to tissue damage, the increased demands that it places on the body are a major cause of perioperative morbidity, especially in patients with pre-existing cardiorespiratory disease. The chronic hypothalamic–pituitary–adrenal axis dysfunction that is seen in patients with a range of comorbidities, including those with psychiatric illnesses, may partly explain the worse surgical outcomes seen in these groups (Manou-Stathopoulou et al, 2019). Indeed, psychological stresses are associated with both impaired wound healing and increased susceptibility to infection (Godbout and Glaser, 2006).

### Psychological factors and perioperative outcomes

Several factors, such as anxiety, depression and psychological stress, appear to be associated with both early and late postoperative complications, including surgical site infection, increased length of stay, and the development of chronic post-surgical pain. In contrast, other psychological factors, such as self-efficacy and optimism, predict positive surgical outcomes and early recovery (Levett and Grimmett, 2019). As many psychological factors are potentially modifiable, there has been growing interest in targeting these for presurgical optimisation.

While much of the literature has focused on surgical outcomes, it is important to also consider the role of perioperative events on long-term psychological morbidity. For example, clinically significant symptoms of post-traumatic stress occur in over 20% of post-surgical patients (El-Gabalawy et al, 2019). Crucially, some of the risk factors for developing post-traumatic symptoms after surgery are potentially modifiable psychological factors, including preoperative anxiety, a perceived lack of control around perioperative events, and the perceived severity of any potential postoperative complications (Pinto et al, 2016).

Paul Young<sup>1</sup>

Author details can be found at the end of this article

Correspondence to:

Paul Young;  
paul.young@doctors.org.uk

How to cite this article:

Young P. Psychological factors and surgical outcomes. *Br J Hosp Med.* 2023. <https://doi.org/10.12968/hmed.2022.0522>

## Psychological interventions and perioperative outcomes

A Cochrane review concluded that psychological preparation may improve key surgical outcomes, including postoperative pain and length of stay, but the strength of evidence was severely limited by the heterogeneity of studies (Powell et al, 2016). Furthermore, a recent scoping review indicated that preoperative psychological interventions may improve postoperative psychological and physiological outcomes (Hanalis-Miller et al, 2022). As such, psychological support now forms a key component of multimodal prehabilitation programmes.

Finally, there is growing evidence to support interventions to prevent long-term psychological morbidity following acutely stressful perioperative events, with early interventions reducing the incidence of patients later developing post-traumatic stress symptoms (El-Gabalawy et al, 2019).

## Conclusions

There are established bidirectional links between mental health and immune dysfunction, potentially explaining the association between psychological factors and surgical outcomes. While psychological interventions seem to improve some important postoperative outcomes, there is a lack of systematic, high-quality evidence to support this.

### Author details

<sup>1</sup>North West School of Anaesthesia, Manchester, UK

## References

- Alessi MG, Bennett JM. Mental health is the health of the whole body: how psychoneuroimmunology and health psychology can inform and improve treatment. *J Eval Clin Pract.* 2020;26(5):1539–1547. <https://doi.org/10.1111/jep.13386>
- El-Gabalawy R, Sommer JL, Pietrzak R et al. Post-traumatic stress in the postoperative period: current status and future directions. *Can J Anaesth.* 2019;66(11):1385–1395. <https://doi.org/10.1007/s12630-019-01418-4>
- Godbout JP, Glaser R. Stress-induced immune dysregulation: implications for wound healing, infectious disease and cancer. *J Neuroimmune Pharmacol.* 2006;1(4):421–427. <https://doi.org/10.1007/s11481-006-9036-0>
- Hanalis-Miller T, Nudelman G, Ben-Eliyahu S, Jacoby R. The effect of pre-operative psychological interventions on psychological, physiological, and immunological indices in oncology patients: a scoping review. *Front Psychol.* 2022;13:839065. <https://doi.org/10.3389/fpsyg.2022.839065>
- Levett DZH, Grimmett C. Psychological factors, prehabilitation and surgical outcomes: evidence and future directions. *Anaesthesia.* 2019;74(Suppl 1):36–42. <https://doi.org/10.1111/anae.14507>
- Manou-Stathopoulou V, Korbonits M, Ackland GL. Redefining the perioperative stress response: a narrative review. *Br J Anaesth.* 2019;123(5):570–583. <https://doi.org/10.1016/j.bja.2019.08.011>
- Pinto A, Faiz O, Davis R, Almouadaris A, Vincent C. Surgical complications and their impact on patients' psychosocial well-being: a systematic review and meta-analysis. *BMJ Open.* 2016;6(2):e007224. <https://doi.org/10.1136/bmjopen-2014-007224>
- Powell R, Scott NW, Manyande A et al. Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. *Cochrane Database Syst Rev.* 2016;2016(5):CD008646. <https://doi.org/10.1002/14651858.CD008646.pub2>