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PD09-02: The Effects of Intraoperative Stress on Surgical Performance: A Systematic Review

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Introduction and Objectives

- **Stress:** the body's reaction to demanding mental and/or physical circumstances with an inadequate perceived ability to cope with these demands.
- Objectives:
 - Identify key stressors
 - Explore the effects stressors have on surgical performance and patient outcome
 - Understand methods of stress assessment



Methods

Inclusion Criteria	Exclusion criteria
<ul style="list-style-type: none">• Primary data studies reporting the effects of stress on surgeons and performance• Trials undertaken in surgical theatre or simulated settings where stress was reported• Any surgical speciality with subjects e.g. surgeons, surgical trainees, residents or medical students	<ul style="list-style-type: none">• Night shifts relating to stress• The effects of stress on mental health e.g. depression• Any medical speciality other than surgery or relating to surgical procedures• Non-surgical trainees• Articles detailing how to cope with stress



Results

- **17** types of intraoperative stressor identified e.g.:
 - Time limitations
 - Complex procedures
 - Bleeding
- Subjects with **less experience** of surgery showed higher error rates and slower task completion time.
- **Background noise** and **music** caused reduced task accuracy and raised stress due to distraction.



Results

- **Heart rate** was used in 5 of 23 studies, making it the most commonly used physiological stress measurement.
 - It rose in response to stressors e.g. time pressure and technical difficulty
- Subjective stress reporting was mainly via **STAI scores** and correlates well with physiological measures (1).
 - Drawback: surgeons may be reluctant to admit intraoperative stress (1, 2)



Discussion

- **Experienced surgeons** are better able to deal with intraoperative stress, allowing for optimum performance.
 - Educating less practiced surgeons on how to deal with stress could improve their performance
- **Heart rate** shows a **sensitivity of 91%**, but a **specificity of 78%** (3).
- The **STAI** score assesses a subject's state and trait of anxiety. The state of anxiety is the most useful acute measurement for intraoperative stress assessment.



Conclusion

- Lack of **experience** was the most commonly reported stressor.
 - Could future training improve this?
- Background **noise** and **music** may increase stress and hamper performance, but can also reduce it.
 - Future studies to look at the difference between types of noise.
- **Heart rate** (objective) and **STAI** (subjective) are the most accurate methods of stress assessment.
- More evidence is required to determine the effects of intraoperative stress and impaired performance on **patient outcome**.



References

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2. Anton N, Montero P, Howley L, Brown C, Stefanidis D. What stress coping strategies are surgeons relying upon during surgery? *Am J Surg* 2015;210(5):846-851.
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