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CLINICAL SUMMARY

SURGEON SYMPTOMS, STRAIN, AND SELECTIONS: SYSTEMATIC REVIEW AND META-ANALYSIS OF SURGICAL ERGONOMICS

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BACKGROUND

Many surgeons experience work-related pain and musculoskeletal symptoms, yet comprehensive reporting of surgeon ailments is lacking in the literature.[1] In the past, this problem was largely ignored, but surgeons are now actively seeking out ways to improve operating room ergonomics. The efforts to improve surgical ergonomics in medical devices lag behind compared to other industrial fields. Therefore, a comprehensive report of surgeons' occupational symptoms and injuries may provide awareness of the ergonomic deficiencies in the surgical environment, and may highlight potential consequences resulting from these deficiencies, ultimately promoting workplace improvements.

OBJECTIVES AND METHODS

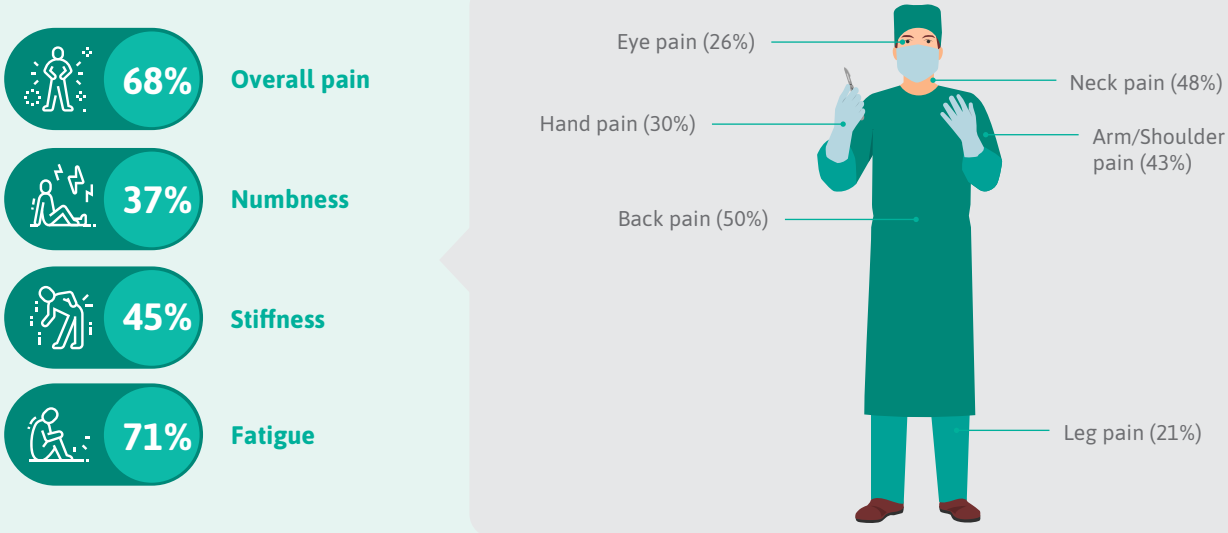
A systematic review was conducted to identify peer-reviewed research articles published between 1980 and 2014 that examined ergonomics in the operating room and surgeon-reported injuries and symptoms associated with various surgical procedures. A review of 40 articles with 5,152 surveyed surgeons were included. Studies were excluded if their main purpose was to provide descriptive reports comparing brands of equipment or ergonomic efficiency of the design rather than on injury risk reduction. The study was limited to standard surgical procedures relatively generalizable to the surgical population, excluding papers reporting on developmental or highly specialized surgeries such as single-incision laparoscopic surgery, natural orifice surgery, and microvascular surgery. The surgeon population included were; general surgery, urology, gynecology, neurosurgery, orthopedic surgery, vascular surgery, cardiothoracic surgery, pediatric surgery, otolaryngology, plastic/hand surgery and ophthalmology. The aim of this meta-analysis was to evaluate surgeons' work-related symptoms and to compare surgical approaches to help determine etiology of symptoms, consequences, and areas at highest risk of injury.

Symptom Consequences for Surgeons:

RESULTS

From the data analyzed, it was found that a substantial number of surgeons worldwide suffer from work-related musculoskeletal ailments. Out of the surgeons surveyed, 68% reported overall generalized pain, 71% reported fatigue from operating, 37% attributed numbness to operating, and 45% reported stiffness from operating.

Percentage of Surgeons Reporting Work-related Symptoms



Site Specific Pain:
The consequences of their pain were indicated with 61% of surgeons saying they felt it was exacerbated during surgery. Yet less than onethird sought treatment. Additionally, it was found that 55-99% of surgeons are unaware of ergonomic recommendations in their hospitals and haven't received mandatory ergonomic training.

Hand Pain

Surgeons performing minimally-invasive surgery (MIS) compared to open surgery were 2.99 times (or 35%) more likely to experience pain in their hands. According to electromyography (EMG) results, the highest recording was noted in the hand/thumb with measurements as high as 95% maximal voluntary isometric contraction (MVIC).

Back Pain

Prevalence of back pain was similar between MIS surgeons and the surveyed surgeons overall at above 50%. An additional meta-analysis examined symptoms in surgeons performing robotic versus laparoscopic versus open surgery and found back pain to be present at 21%.[2]

CONCLUSION

Surgeons' symptoms may be due to chronic and repetitive processes during surgery that can cause musculoskeletal strain and ultimately injury. The back and hand were found to be two of the muscle groups that undergo the most strain. Ergonomic interventions do exist to help reduce or eliminate the common symptoms found. Therefore, training on proper ergonomics, awareness of current recommendations, and products to support proper range of motion and comfort are key.

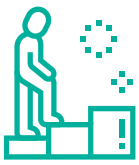
APPLICATION FOR PRACTICE

1. 

Attend ergonomic training and follow facility guidelines and procedure

2. 

Understand and be aware of proper body motion to prevent musculoskeletal symptoms and work-related pain from occurring

3. 

Use products that support proper body ergonomics (i.e., Anti-fatigue mats, ergonomic step stools, lifting aids, and selecting an ergonomically designed glove)

Note: This clinical summary is written by clinicians at Ansell Healthcare Products LLC. Please refer to the actual study for full text information.

Stucky CH, Cromwell KD, Voss RK, et al. Surgeon symptoms, strain, and selections: Systematic review and meta-analysis of surgical ergonomics. Ann Med Surg (Lond). 2018;27:1-8.

Reference:

1. *Stucky CH, Cromwell KD, Voss RK, et al. Surgeon symptoms, strain, and selections: Systematic review and meta-analysis of surgical ergonomics. Ann Med Surg (Lond). 2018;27:1-8 Published 2018 Jan 9.*
   Full text article link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5832650/
2. *Plerhoples TA, Hernandez-Boussard T, Wren SM. The aching surgeon: a survey of physical discomfort and symptoms following open, laparoscopic, and robotic surgery. J Robot Surg. 2012;6(1):65-72.*
   Full text article link: https://link.springer.com/article/10.1007/s11701-011-0330-3

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