Surgical Ergonomics and Musculoskeletal Pain in High-Risk Specialties: A Single-Institution, Multi-Department Survey Study

Michael Guenoun, B.A. [1], *Deena B. Chihade, M.D.*[2], *Kimberly Kedenburg, D.P.T, Palma M. Shaw, M.D., M.B.A*[2]

[1] *SUNY Upstate Medical University, Norton College of Medicine;* [2] *Division of Vascular Surgery and Endovascular Services, Department of Surgery, SUNY Upstate Medical University*

INTRODUCTION

- Work-related musculoskeletal injuries experienced by surgeons have historically been under-reported and inadequately addressed.[1]
- Studies have demonstrated these phenomena correlate highly with associated morbidity of the operator.[2]
- Injuries can lead to attrition[3] exacerbating the growing physician workforce shortages.[4]

OBJECTIVES

- Assess the prevalence of ergonomic injuries
- Characterize their impact among interventionists with the goal of implementing a curriculum to mitigate common injuries

METHODS

- Utilizing the RedCap platform, an internal descriptive survey of physicians and trainees from multiple departments was performed.
- Inquiries such as work-related pain, activity levels, and use of ergonomics aids in addition to proper technique and desire for ergonomic education were included in a scaled multiple-choice survey.
- The study launched July 2023, and preliminary data was extracted after 3 weeks.
- Statistical analysis was used to gauge pain levels, wellness adherence and the desire for ergonomics training among participants.

RESULTS

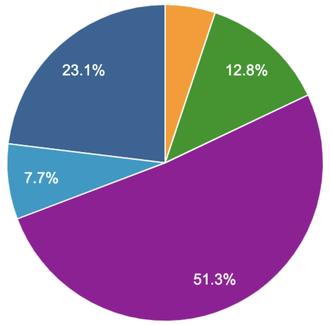

Figure 1: Cohort Selection Process. Cohorts were assembled through RedCap survey responses, gathering input from 39 participants, encompassing both physicians and trainees. Among physicians, a breakdown by specialty was conducted, revealing a diverse representation across various medical fields: Vascular Surgery (2, 5.1%), Orthopedic Surgery (5, 12.8%), General Surgery (20, 51.3%), Urology (3, 7.7%), and Other (9, 23.1%). This diverse distribution ensures a comprehensive exploration of perspectives within the healthcare community.

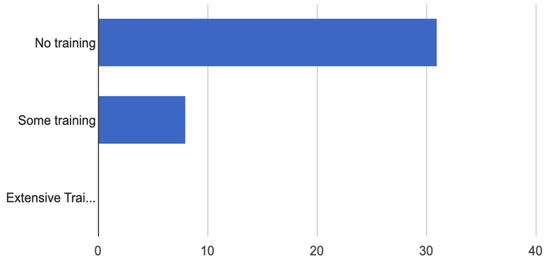

Figure 2: Baseline Ergonomics Training. Participants were evaluated based on their foundational understanding of ergonomics training with the aim of establishing a potential link between insufficient ergonomics education and the occurrence of musculoskeletal problems. The majority of participants (79.5%) reported no exposure to training, whereas 20.5% indicated some training; none reported receiving extensive ergonomics training.

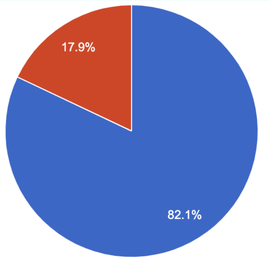

Figure 3: Desire For Ergonomics Education. The pie chart illustrates physicians' responses to the inquiry about their interest in receiving ergonomics training for workplace evaluation. Notably, a significant majority of respondents, comprising 82.1% of the cohort, expressed a keen interest in such training ('Yes'). Conversely, a minority, constituting 17.9%, indicated a lack of interest ('No'). This distribution reflects the diversity of opinions within the surveyed physician population regarding the potential impact of ergonomics training on their work environment and overall well-being.

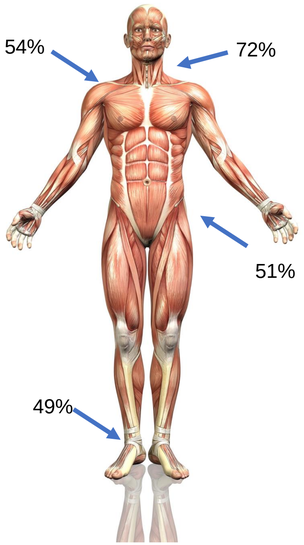

Figure 4: Body Pain Distribution Among Respondents. The anatomical figure illustration highlights prevalent pain areas reported by respondents, with 72% indicating neck pain, 54% in the shoulders, 51% in the lower back, and 49% in the foot/ankles. Pain intensity, rated on a scale of 0-5, along with descriptive terms like “sharp pain” and “ache,” adds nuance to the diverse experiences expressed by participants.

RESULTS (cont.)

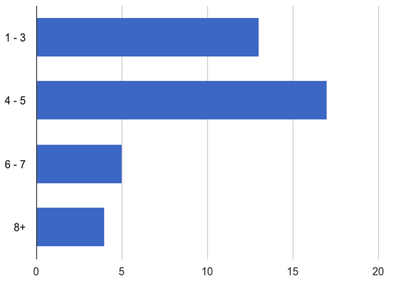

Figure 5: Time Spent Standing. On average, surveyed physicians spend more than 4 hours standing, adding to the ergonomic strain experienced

CONCLUSIONS

- Reveals potential impact of an ergonomics program on well-being and pain management, particularly considering the high prevalence of work-related musculoskeletal injuries reported by most survey participants.
- Signifies a considerable number of respondents lacking prior ergonomic training, emphasizing the urgency of implementing comprehensive educational initiatives.
- Indicates a palpable eagerness among respondents for further training, stressing the critical need to establish ergonomic education and practices within our institution.
- Prioritizing physician well-being can lead to immediate improvements in pain management, contributing to the long-term sustainability of surgeons' careers.

REFERENCES

1. Kyung M, Lee SJ, Dancu C, Hong O. Underreporting of workers' injuries or illnesses and contributing factors: a systematic review. *BMC Public Health*. 2023;23(1):558. Published 2023 Mar 24. doi:10.1186/s12889-023-15487-0Bellosta R, Luzzani L, Natalini G, et al. Acute limb ischemia in patients with COVID-19 pneumonia. J Vasc Surg. 2020;72(6):1864-1872. doi:10.1016/j.jvs.2020.04.483
2. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors Related to Physician Burnout and Its Consequences: A Review. *Behav Sci (Basel)*. 2018;8(11):98. Published 2018 Oct 25. doi:10.3390/bs8110098Liang S, Zhou L, Ye K, Lu X. Limb Salvage After Percutaneous Mechanical Thrombectomy in Patients with Acute Lower Limb Ischemia: A Retrospective Analysis from Two Institutions. *Ann Vasc Surg*. Jul 2019;58:151-159. doi:10.1016/j.avsg.2018.11.025
3. Silver JK, Bean AC, Slocum C, et al. Physician Workforce Disparities and Patient Care: A Narrative Review. *Health Equity*. 2019;3(1):360-377. Published 2019 Jul 1. doi:10.1089/heq.2019.0040
4. “Burn-out an ‘occupational phenomenon’: International Classification of DIseases,” World Health Organization, Feb. 12, 2024, https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases.
5. Image: “Freepik.com”