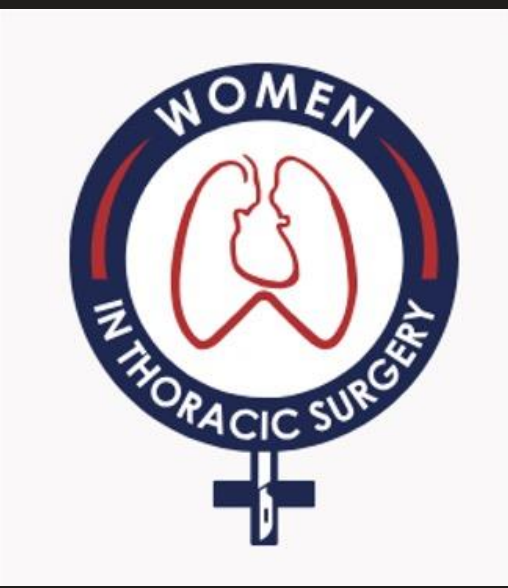




Ergonomic Burden Across Operative Modalities in Women in Thoracic Surgery

Samoylova ML, Sakowitz S, Papageorge M, Stanley M, Boyd R, Lin N, Cangut B, Jindani R, Bevers K, Rajah T, Grewal N, DiChiacchio L, Worrell S, Watkins AA, Antonoff MB

Department of Thoracic and Cardiovascular Surgery | The University of Texas MD Anderson Cancer Center | Houston, TX



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Background

Cardiothoracic surgery involves physically demanding, prolonged operations that place substantial ergonomic strain on surgeons.

Women surgeons experience **higher rates of work-related musculoskeletal pain and injury** compared to male colleagues.

Minimally invasive (MIS) approaches may reduce ergonomic burden, yet potential physical advantages for women in cardiothoracic surgery remain underexplored.

Objectives

Compare ergonomic burden across operative modalities among women in cardiothoracic surgery.

Primary: Pain scores by body region per operative approach.

Secondary: Identification of modifiable ergonomic contributors.

Methods

Design: Anonymous survey at the 2025 Women in Thoracic Surgery (WTS) Conference via QR code and email.

Domains: Demographics, anthropometrics, operative approaches, body region pain, and ergonomic contributors.

Assessment: Ordinal pain scales (0–5) by body region per modality; free-text for qualitative context.

Analysis: Descriptive statistics; pairwise mean pain score comparisons across modalities.

Results

Participant Demographics (N=36)

36	35	65.5"	94%
Respondents	Median Age	Median Height	Right-Handed

Operative Approaches

Open: 31 respondents (86.1%)

Thoracoscopic (VATS): 27 respondents (75.0%)

Robotic: 23 respondents (63.9%)

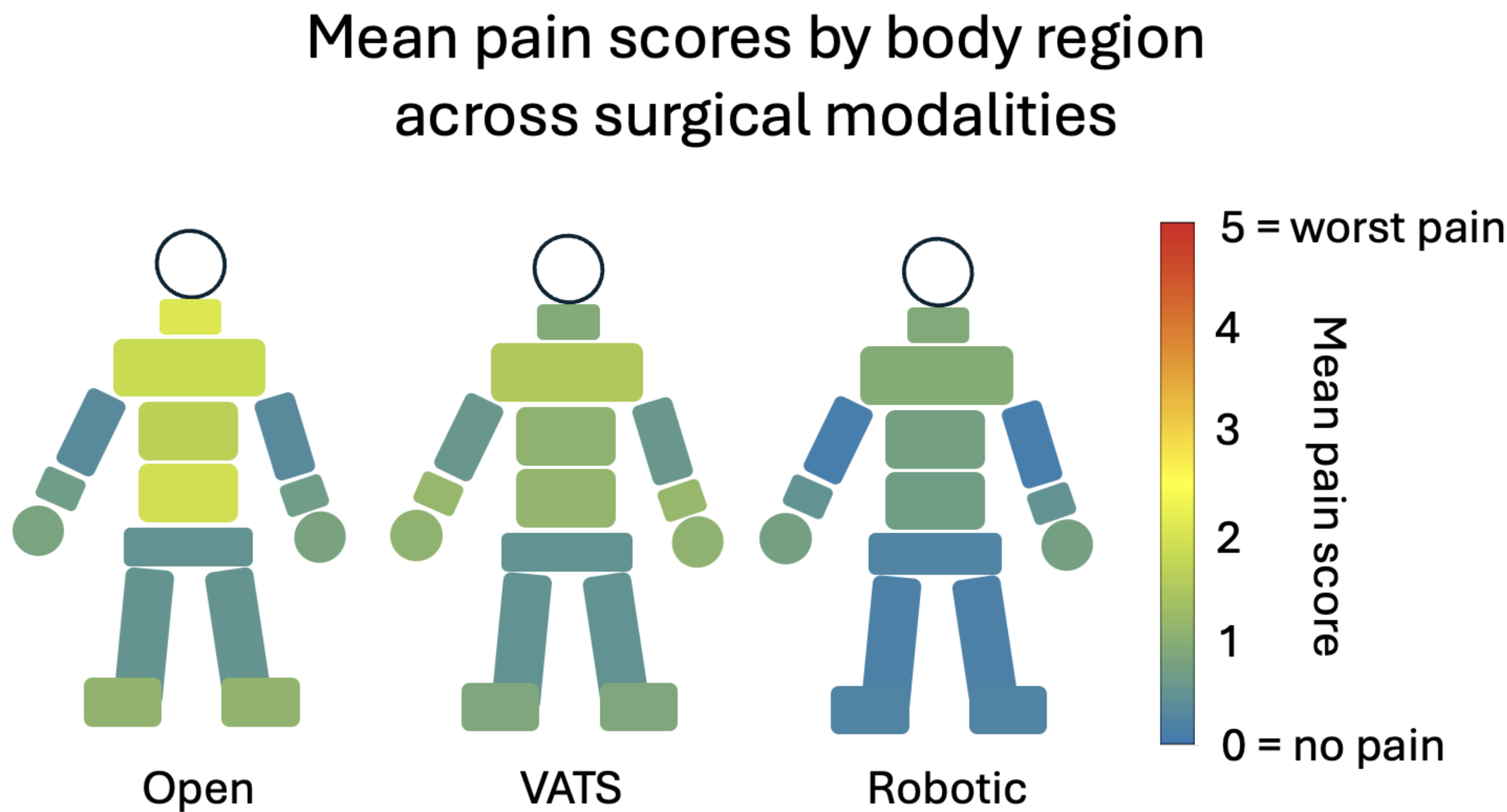


Figure: Mean Pain Scores by Body Region Across Surgical Modalities

Pain Scores by Operative Approach

Open Surgery Highest ergonomic burden. Greatest pain in neck (2.07) , lower back (1.93) , shoulders (1.83) , upper back (1.66). Key contributors: case duration, table height, instrument handle size.	Thoracoscopic (VATS) Intermediate burden. Highest pain: shoulders (1.52) , wrists (1.16) , lower back (1.12). Neck and lower back significantly lower than open (p=0.0005; p=0.037). <i>Overall mean pain not significantly different from open.</i>	Robotic Surgery Lowest overall pain. Mean score 0.52 vs. 1.14 (open surgery) p = 0.0014
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Conclusions

Ergonomic burden among women thoracic surgeons varies significantly by operative approach.

Greatest pain occurs during open operations — particularly the neck, lower back, and shoulders.

Robotic surgery is associated with the lowest overall pain scores (mean 0.52 vs. 1.14; p=0.0014).

Case duration, table height, and instrument handle size are key modifiable ergonomic targets.