

MAKING PLASTIC SURGERY SMOKE-FREE: A *COST-EFFECTIVENESS ANALYSIS*

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Introduction

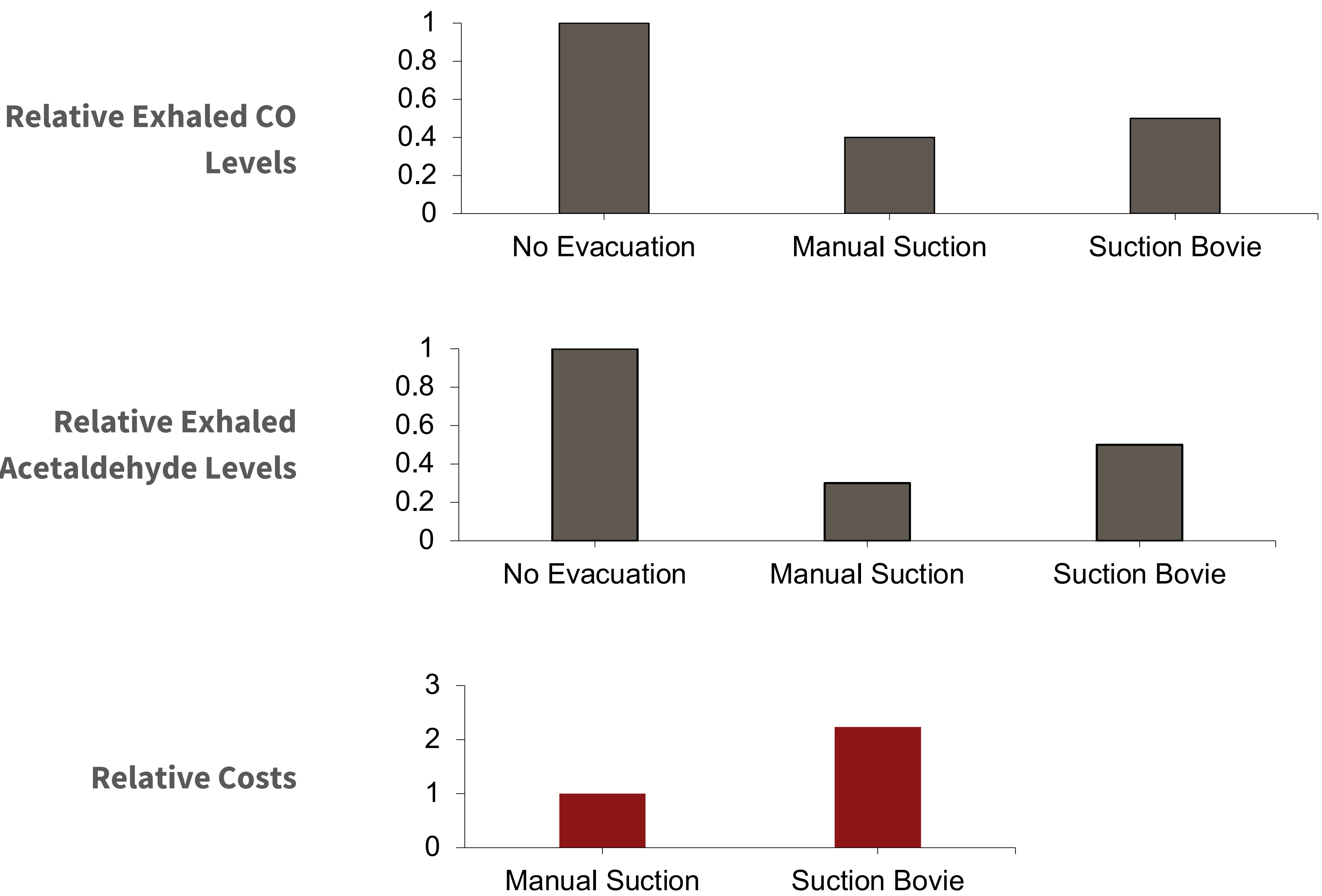
- Surgical smoke is a significant occupational safety hazard; plastic surgeons may be at disproportionate risk given large, surface-level procedures inherent to this field (e.g., body contouring, burn surgery).
- Surgical smoke is composed of carcinogenic, harmful elements (carbon monoxide, acetaldehyde, benzene, formaldehyde, etc.) at or exceeding OSHA limitations
- This study investigated surgical smoke exposure across common plastic surgery procedures, as well as cost-efficacy of interventions for smoke evacuation.

Methods

- Prospective investigation of surgical smoke exposure amongst plastic surgeons and trainees during three common plastic surgery procedures:
 - abdominoplasty/panniculectomy
 - breast reduction
 - breast reconstruction with abdominal free flap
- Surgical smoke exposure was measured using breathalyzer tests as a proxy for exhaled (1) carbon monoxide and (2) acetaldehyde before and after aforementioned case types, adjusted for baseline values and smoking history.
- Smoke evacuation techniques included manual suction, suction bovie, with no evacuation as a negative control

Results

There was a significant increase in exhaled carbon monoxide (ppm) and acetaldehyde (% exhaled ethanol) following all 3 selected procedures, when compared to the preoperative timepoint.



There was a mean time of 2.5 hours prior to normalization of measured exhalants to preoperative values.

Conclusions

- Surgical smoke during common plastic surgery procedures results in significant increases in exhaled carbon monoxide and acetaldehyde
- Suction bovies are convenient but come at increased cost at around \$450 for a 3-fold reduction in exhaled CO/acetaldehyde per case.
- Incorporating smoke evacuation method in surgical timeouts can improve compliance.

Implications

- These data support recent legislative efforts to mandate surgical smoke evacuation in all operating rooms in certain states.

Limitations

- Limited sample size
- Efficacy of various techniques is user dependent (e.g., manual suction)