

# An Observational Study Comparing Intrathoracic Pressure Changes and Stroke Volume Variation with Abdominal Insufflation

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### Background

- Stroke volume variation (SVV) serves as a predictor for fluid responsiveness during mechanical ventilation<sup>1</sup>
- Esophageal pressure (Pes) provides valuable measurement of intrathoracic pressure changes<sup>2</sup>
- Current literature shows inconsistent findings on SVV changes during pneumoperitoneum

### Study Objective

To investigate the impact of abdominal insufflation on:

- Stroke volume variation
- Esophageal pressure
- Pulmonary and hemodynamic measurements

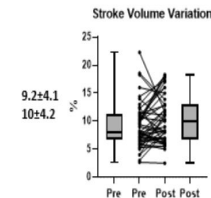
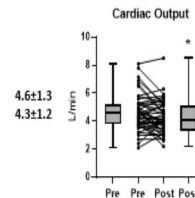
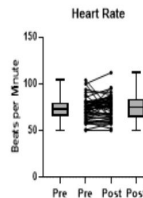
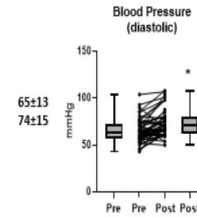
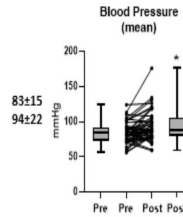
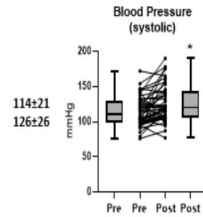
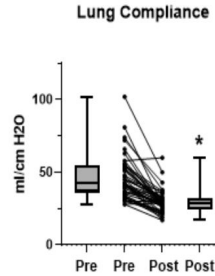
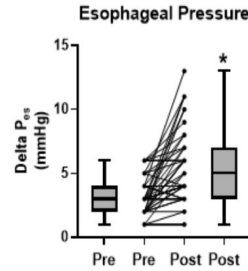
### Methods

Study Design:

- Single-site, non-randomized observational study
- Adult ASA I-III patients undergoing elective laparoscopic surgery
- Written informed consent obtained

Measurements:

- Edwards HemoSphere monitor: SVV and hemodynamic variables
- Esophageal balloon catheter: Pes measurement
- Pre- and post-insufflation data collection
- Statistical analysis using Wilcoxon test



### Results

Patient Demographics (n=100):

- 47 patients: Tidal Volume 7-9 mL/kg (IBW)
- Mean age: 52 ± 18 years
- Mean IBW: 58.8 ± 8.1 kg

Key Findings:

- ΔPes increased: 3.1±1.5 to 5.5±2.9 mmHg
- Lung compliance decreased: 47±15 to 29±8 ml/cmH<sub>2</sub>O
- Blood pressure showed modest elevation
- Cardiac output slightly decreased
- No consistent changes in SVV

### Conclusion

- Abdominal insufflation significantly affects:
  - Esophageal pressure (increase)
  - Lung compliance (decrease)
- Modest hemodynamic changes observed
- SVV remains stable despite these physiologic changes

### Next Steps

Future research should:

- Explore impact of various positional changes on esophageal pressure

### References

1. Reuter, et al. Intensive Care Med; 2022; 28(4):392-8
2. Grieco, et al. Journal of Translational Medicine; 2017; 5(14):285