



CONTINUOUS INTRAOPERATIVE PRESSURE MAPPING: STUDYING THE PATTERNS OF TISSUE INTERFACE PRESSURE

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Problem and Significance

- ❑ Intraoperative patients are at high risk for pressure injuries due to unrelieved pressure, vasoactive medications, and inability to perceive pain.
- ❑ Approximately, 4%-45% of HAPIs in surgical patients originate in the operating room (NPUAP).
- ❑ Pressure injuries increase morbidity, length of stay, number of readmissions, and cost of the surgical stay.
- ❑ The magnitude and duration of pressure are key determinants of pressure injuries.
- ❑ understanding pattern of tissue interface pressure and identifying factors that contribute to increased magnitude will increase awareness of risk factors and help guide prevention strategies.

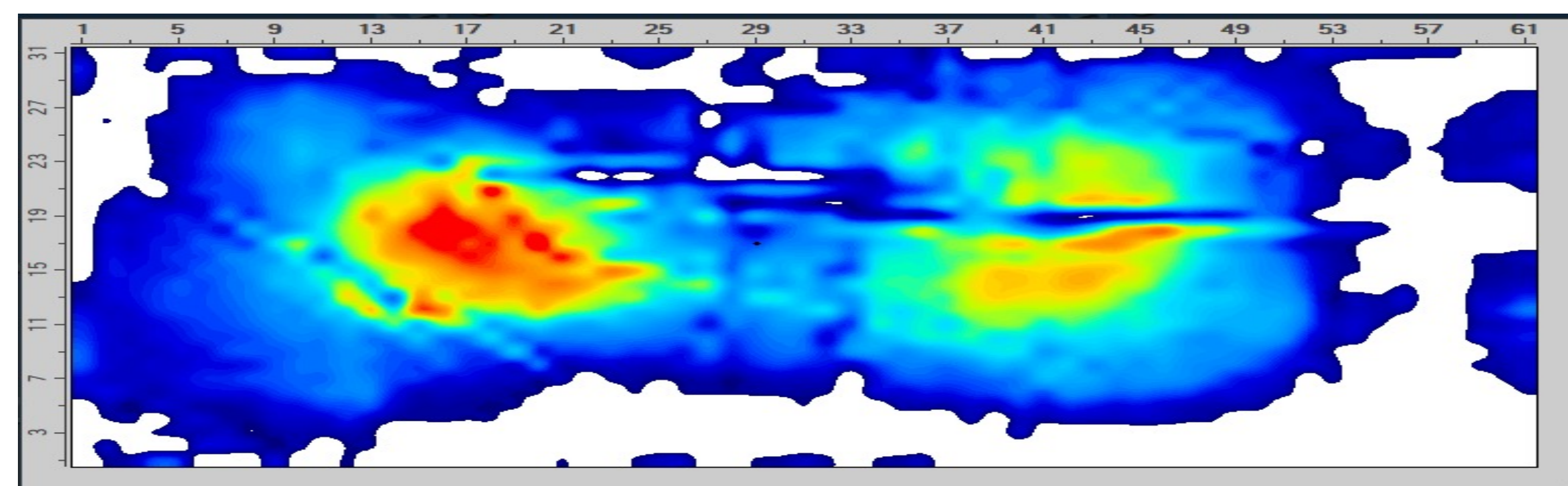
Purpose

The purpose of this study was to examine patterns of tissue interface pressure and time spent above critical pressure levels in 4 anatomical locations in intraoperative patients; and to explore associations between patient and surgery-related variables and magnitude of interface pressure

Methods

- Design:** Descriptive repeated measures design
- Setting:** Operating Room of a Magnet®-recognized hospital
- Sample:** A convenience sample of 150 adult male & female patients undergoing surgery lasting >15 minutes under general or regional anesthesia.
- Instrument:** XSENSOR X3 Pro8 (XSENSOR Tech Corp Calgary, CA)

Figure 1. Image showing pressure points on torso



Methods Cont'd

Study Procedures:

- ❑ Study was approved by the hospital's Institutional Review Board
- ❑ After signing the consent form, patient was placed on an OR table topped with a regular OR mattress equipped with XSENSORS.
- ❑ The mattress was connected to a laptop computer equipped with XSENSOR software that translated voltage difference into real time pressure (mmHg).
- ❑ Interface pressure was measured, throughout surgery, in 4 anatomical locations: Rt & Lt scapulae, between scapulae & sacrum
- ❑ Demographic data, comorbidities, and surgical procedure data were collected from patients' medical records

Data Analysis

We implemented multiple linear regression modeling to assess mean interface pressures over the 4 anatomical locations and to identify predictors of duration of time interface pressure was above 60mm Hg.

Results

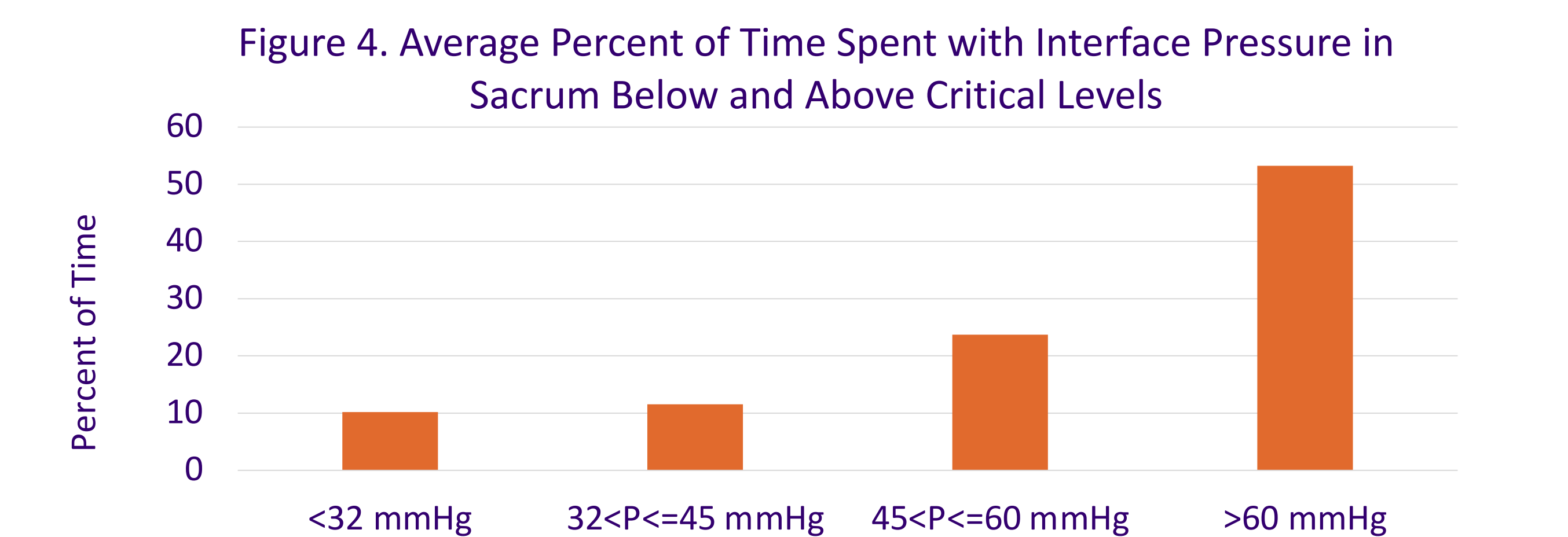
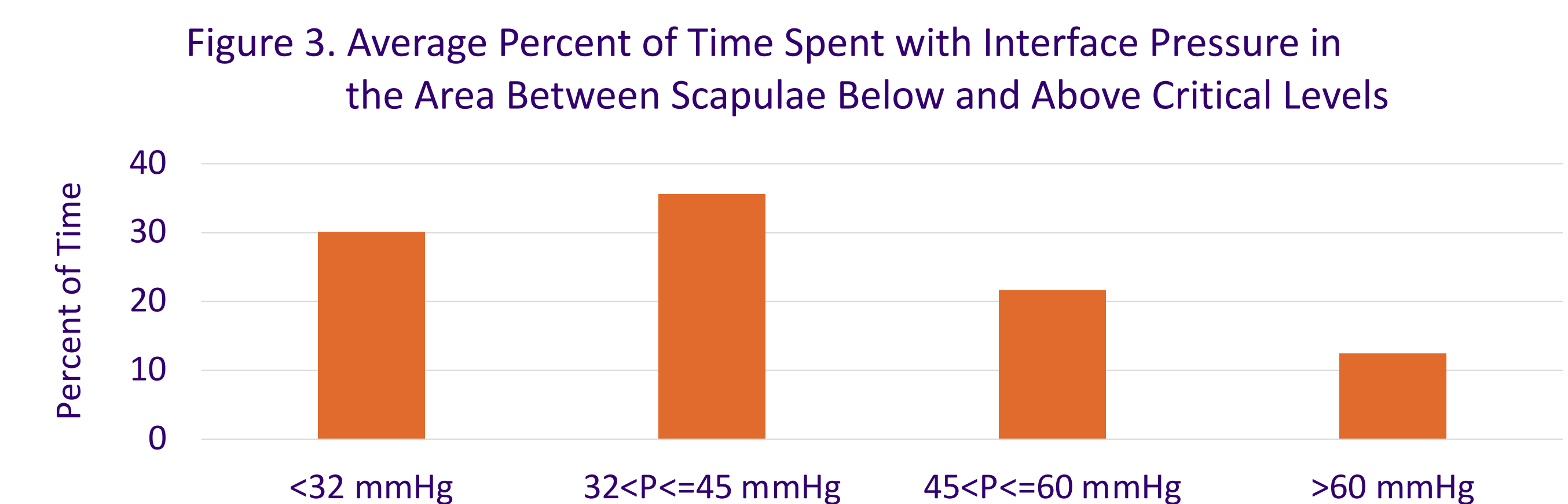
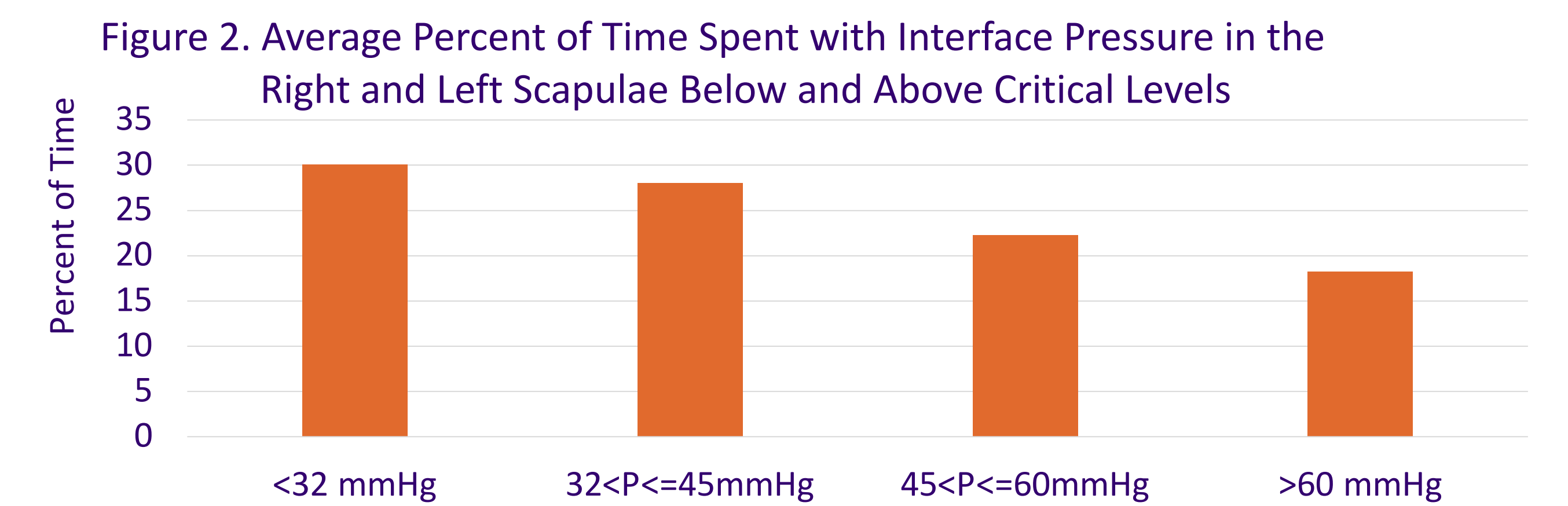
Demographic Characteristics:

- ❑ Majority of patients were females, 46 -89 years old with BMI (>25), non smokers, and had good nutritional status.
- ❑ Majority had at least one co-morbidity.
- ❑ Majority underwent general anesthesia, had supine position surgery, had good ASA status and good Braden score.
- ❑ Mapping of interface pressure ranged between 16 minutes and 6 hours

Predictors of tissue in interface Pressure

- ❑ Tissue interface pressure increased significantly in the 4 anatomical locations in response to increased **length of surgery** ($p < 0.1$) and increased **BMI** ($p < .01$).
- ❑ **Gender, type of anesthesia, nutritional status, ASA status, and supine position** during surgery were significant predictors of mean, peak and magnitude of interface pressure ($p < .05$) (see figures 2, 3, and 4

Results Cont'd



Conclusions

- ❑ All four anatomical locations experienced critically high and potentially dangerous tissue interface pressure during surgery
- ❑ Effects of BMI and length of surgery on time spent above critical pressure levels were most impactful on the sacrum.
- ❑ Implementation of tissue interface pressure mitigation strategies in intraoperative patients is imperative.

