

Effectiveness of Fascial Plane Blocks and Paravertebral Blocks on Pain Scores and Respiratory Outcomes in Rib Fracture Patients

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Introduction

- Uncontrolled rib fracture pain leads to increased:
  - Morbidity, long-term disability, mortality
- Inadequate respiratory efforts lead to:
  - Atelectasis, pneumonia, respiratory failure

Methods

- Prospective cohort of all trauma patients with ≥ 3 rib fractures admitted to Milton S. Hershey Medical Center from 12/2021 through 12/2023
- Patients categorized by injury severity score (ISS) and if they received a regional procedure for pain relief
- Pain scores, respiratory status, and incentive spirometer breathing device (ISB) values were investigated

Results

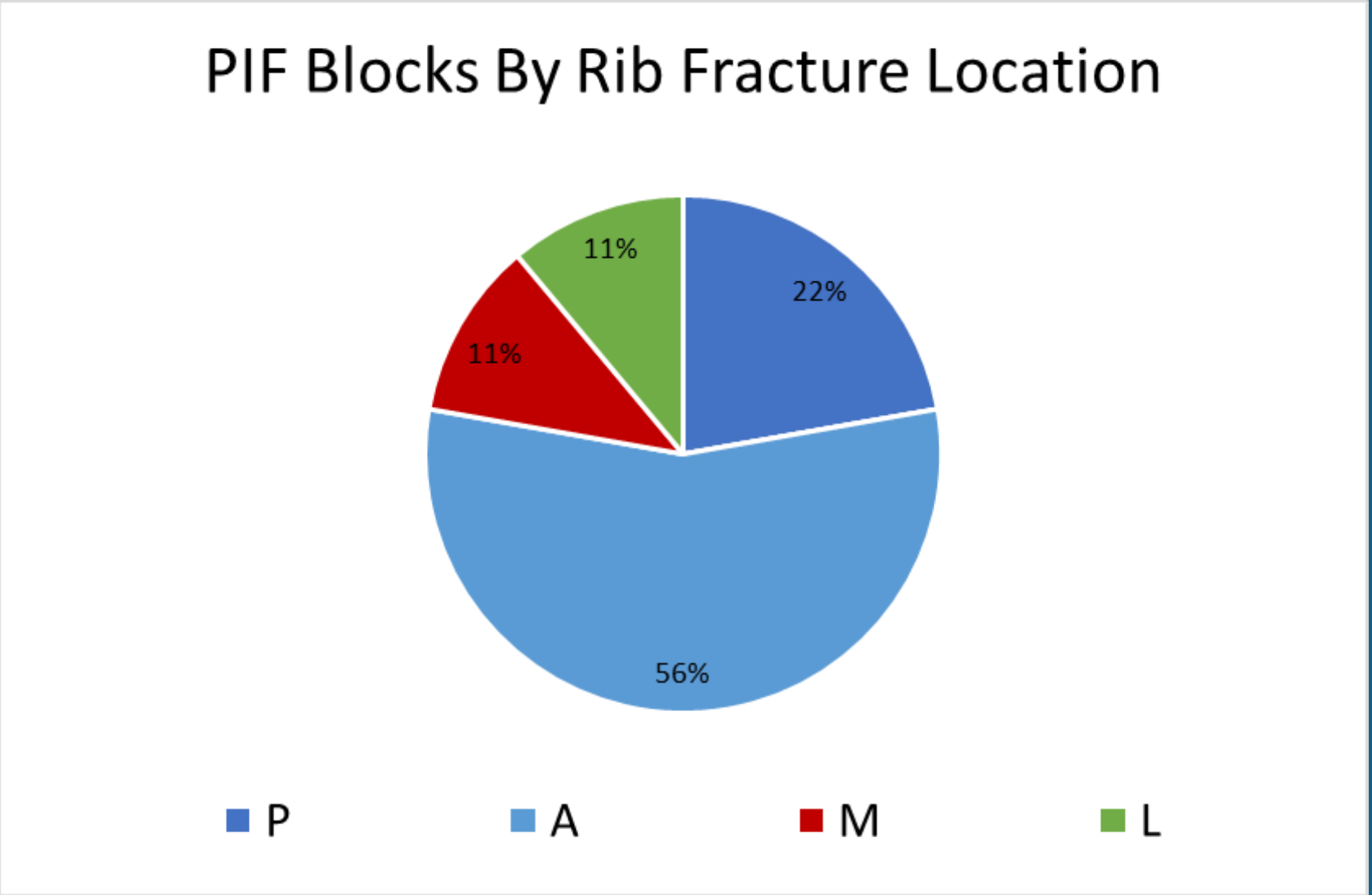
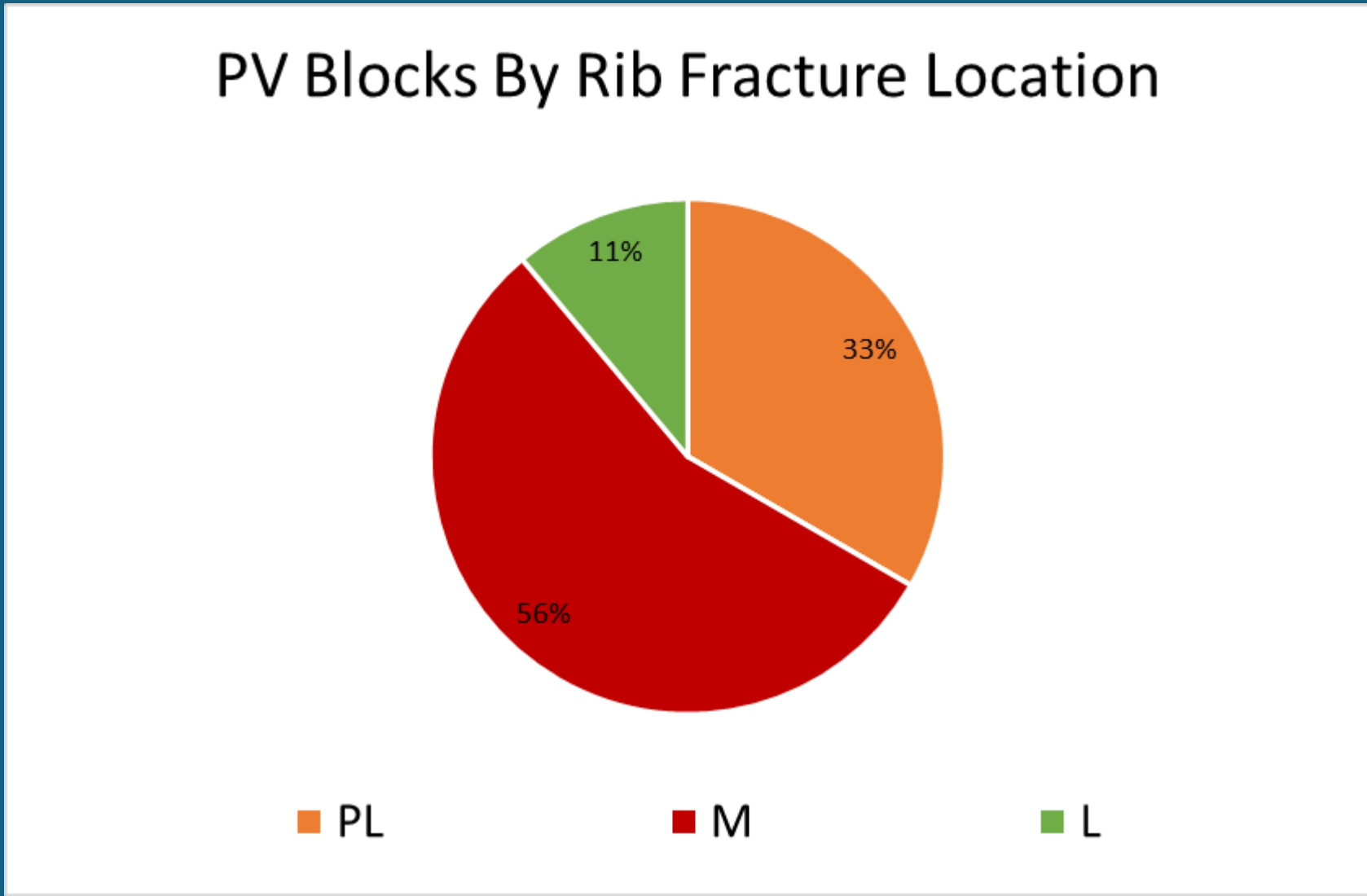
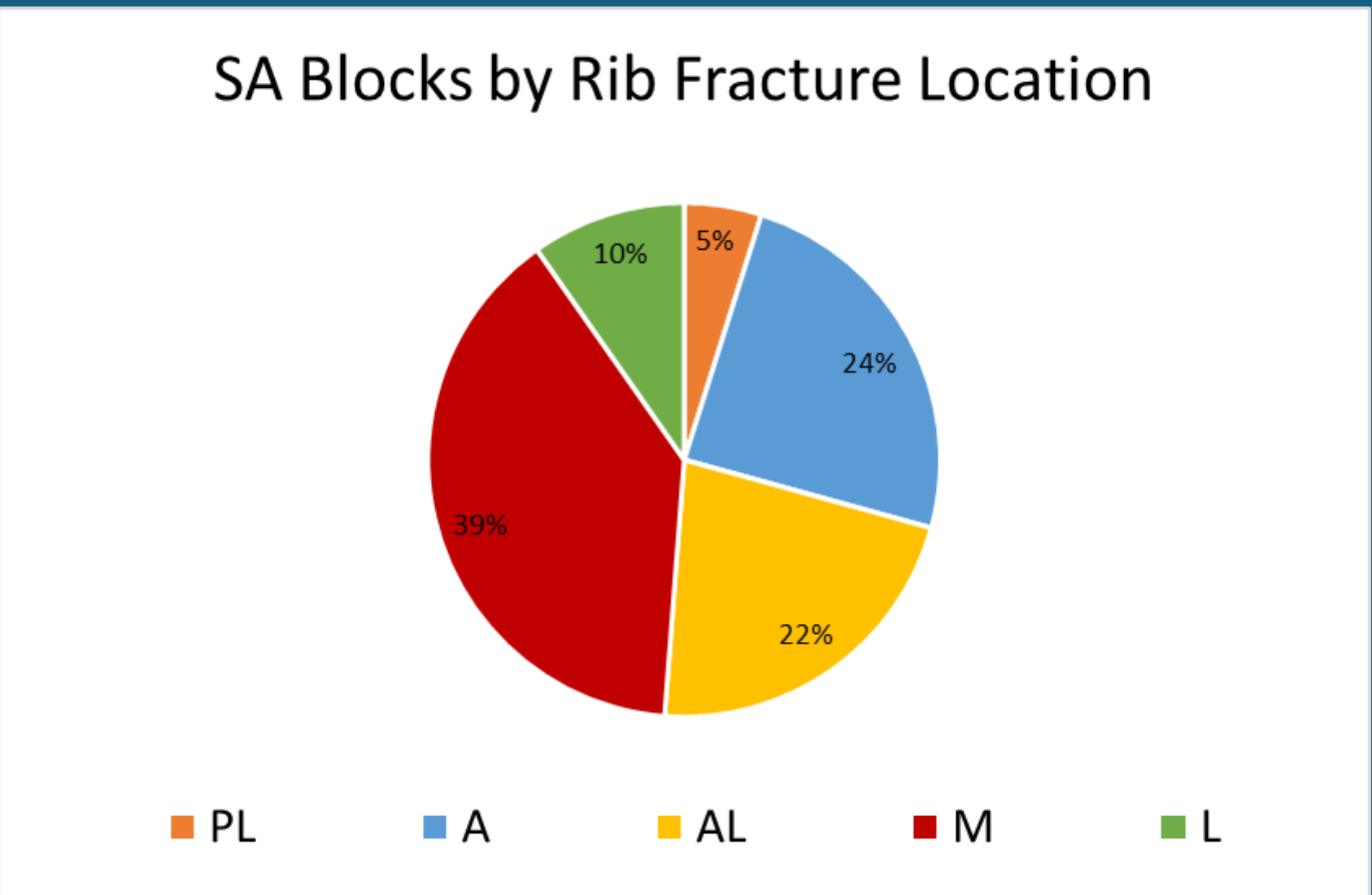
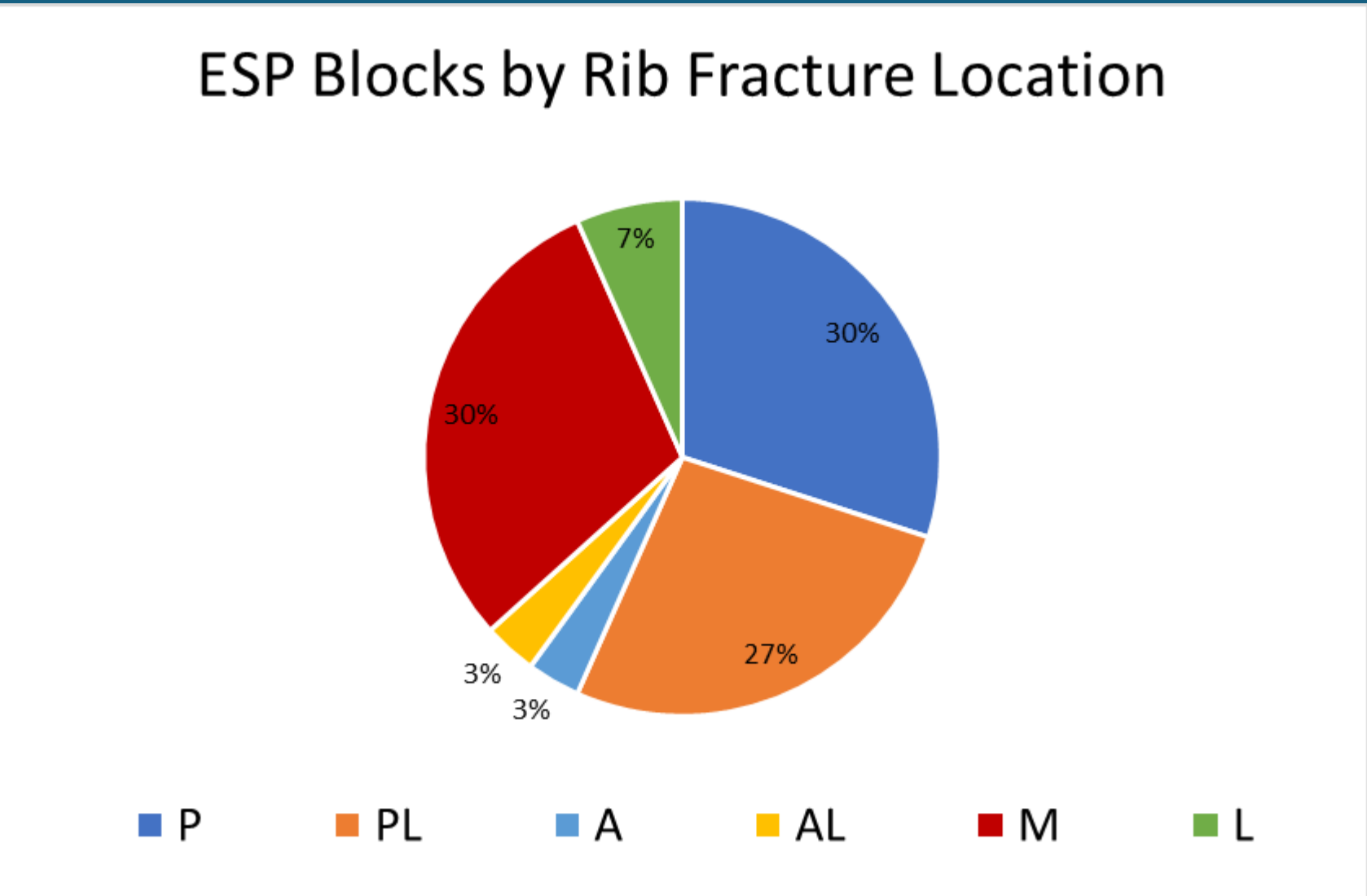
- The average pain score decreased after regional procedures
- No patients in the low ISS group were intubated after regional intervention
- All patients intubated on arrival were extubated after intervention, except one patient
- ISB values increased for 52% of patients after regional procedure
- Eight regional procedures were replaced by a second regional procedure, six resulting in improvements in pain control
- ESP blocks were utilized the most for posterior and posterolateral rib fractures
- SA blocks were utilized the most for more anterior and anterolateral rib fractures
- PV blocks were utilized the most for rib fractures at multiple locations
- PIF blocks were utilized the most for anterior rib fractures

Discussion

- All regional procedures are effective in reducing pain in patients with multiple rib fracture
- These blocks may potentially improve respiratory status in this patient population
- Missing data for ISB values and pain scores limited further analysis for effectiveness of regional procedures
- Fascial plan blocks are preferred in the setting of anticoagulated patients



Regional Anesthesia Procedures are Effective in Reducing Pain and Potentially Improving Respiratory Status in Trauma Induced Multiple Rib Fracture Patients

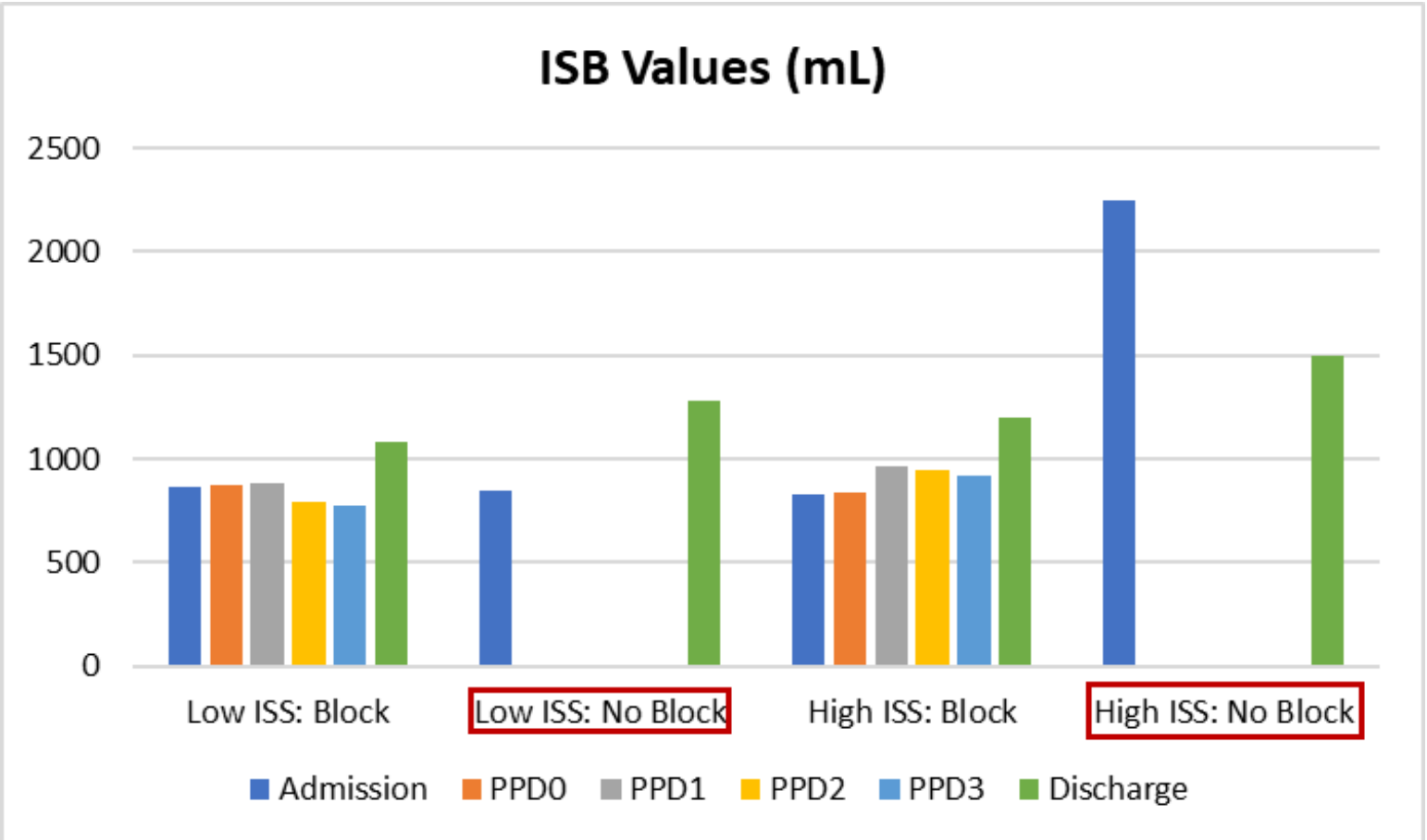
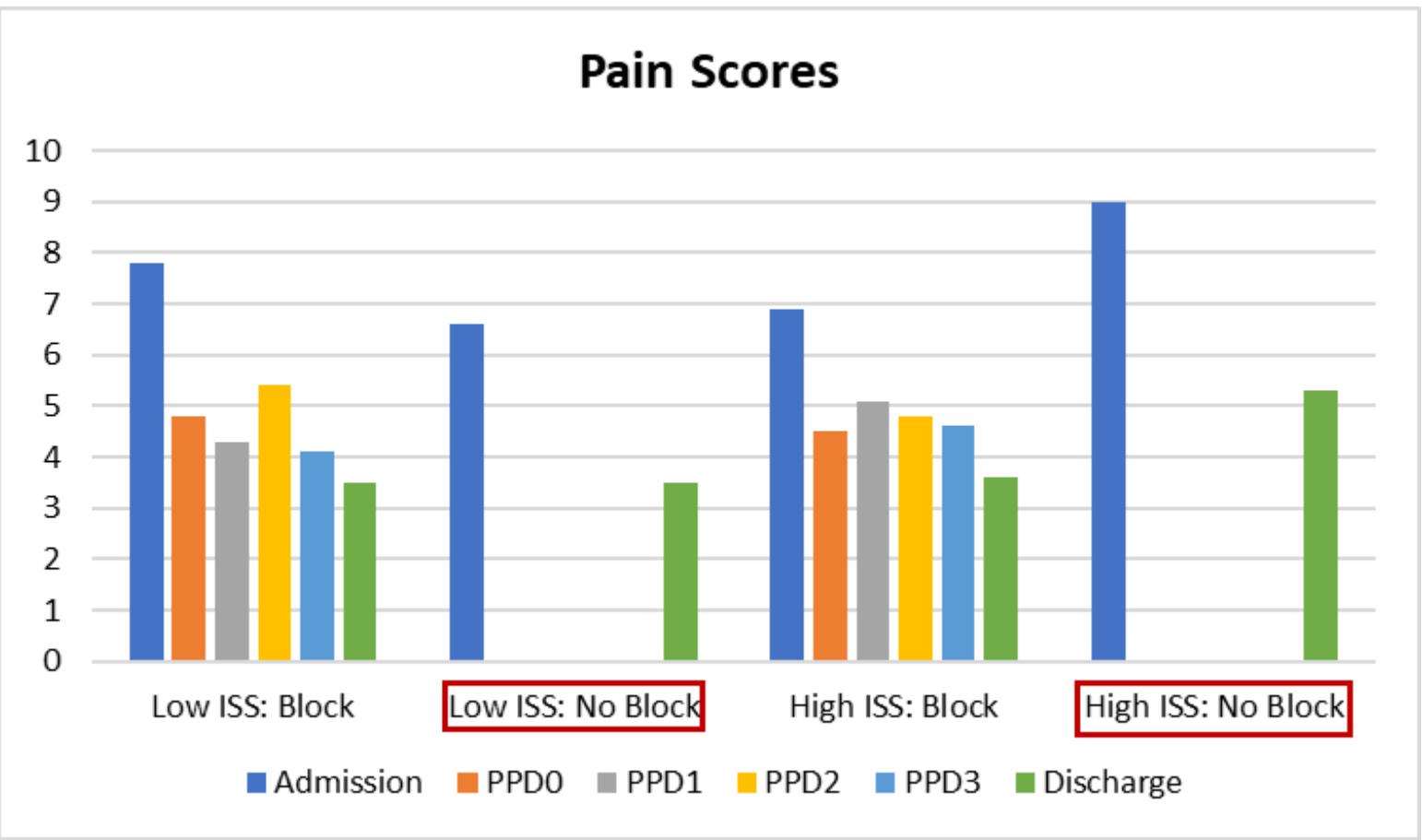


Posterior (P), Posterolateral (PL), Anterior (A), Anterolateral (AL), Multiple Locations (M), Lateral (L)

| Patient Demographics            |               |          |                |          |       |
|---------------------------------|---------------|----------|----------------|----------|-------|
|                                 | Low ISS (≤15) |          | High ISS (>15) |          | Total |
|                                 | Block         | No Block | Block          | No Block |       |
| Number of Patients              | 48            | 16       | 30             | 4        | 98    |
| Average Age                     | 74            | 66       | 60             | 43       | 61    |
| Females                         | 11            | 1        | 23             | 4        | 39    |
| Males                           | 37            | 15       | 7              | 0        | 59    |
| Average ISS                     | 11.3          | 10.2     | 22.9           | 22.8     | 16.8  |
| Average # Right Rib Fractures   | 9             | 5        | 6              | 8        | 7     |
| Average # of Left Rib Fractures | 5             | 5        | 6              | 7        | 6     |

| Regional Anesthesia Procedure Outcomes |               |                |       |
|----------------------------------------|---------------|----------------|-------|
| Procedure Type                         | Low ISS (≤15) | High ISS (>15) | Total |
| ESP                                    | 22            | 7              | 29    |
| SA                                     | 18            | 17             | 35    |
| PIF                                    | 4             | 1              | 5     |
| PV                                     | 4             | 4              | 8     |
| Epidural                               | 1             | 1              | 1     |
| Change in Procedure Type               | 4             | 4              | 9     |

Injury Severity Score (ISS), Erector Spinae Plane (ESP), Serratus Anterior (SA), Pecto-Intercostal Fascial (PIF), Paravertebral (PV)



Injury Severity Score (ISS), Post Procedure Day (PPD)

