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### Prehospital Tension Pneumothorax: A Retrospective Review of Indications

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# Prehospital Indications for Needle Decompression

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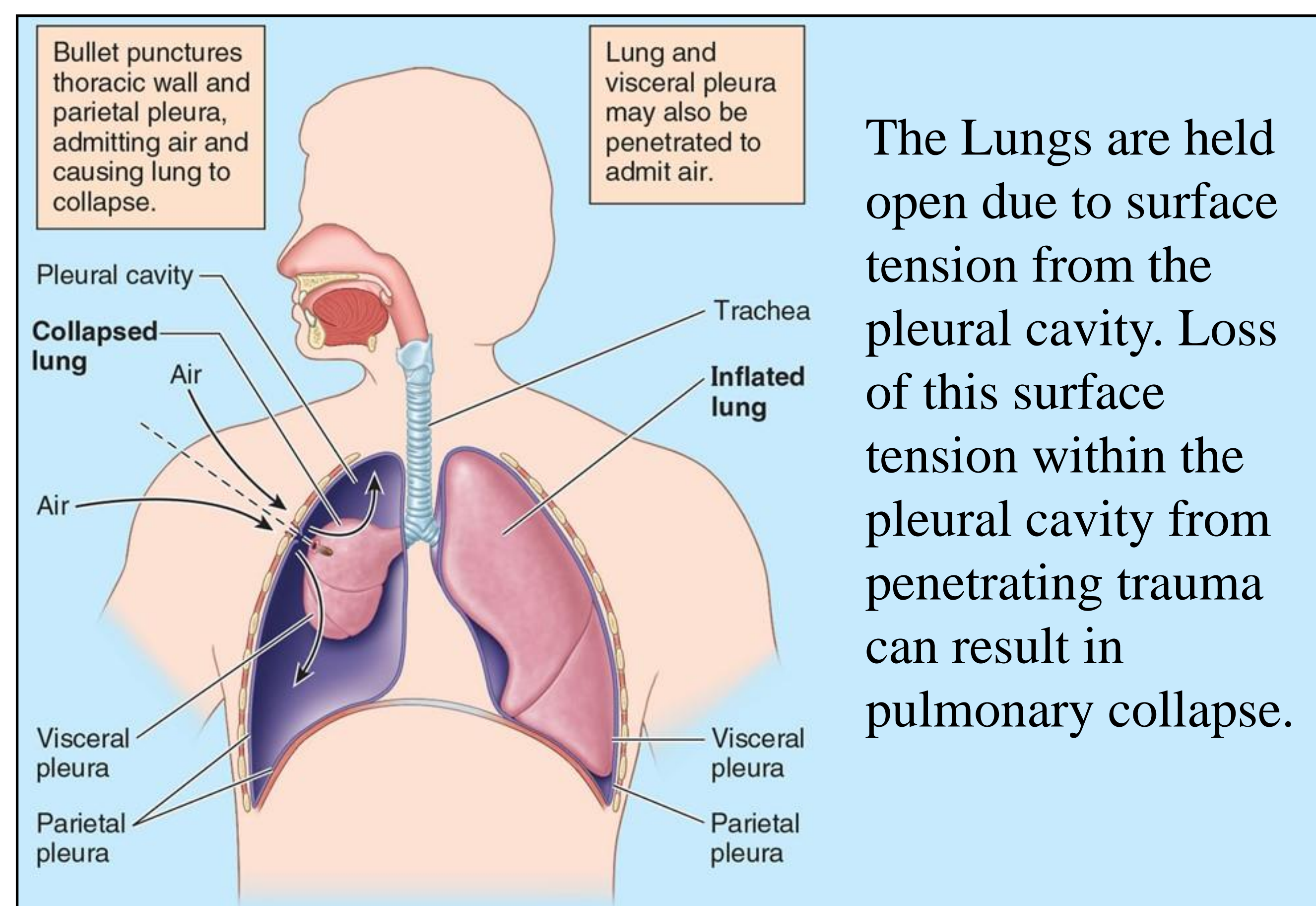
## Introduction

- Thoracic trauma can result in the development of a pneumothorax, which is defined as a collapsed lung
- Tension pneumothorax is a life-threatening condition caused by the build up of pressure around the lungs leading to obstructive shock
- Needle thoracostomies, which involves the insertion of a needle into the pleural cavity to release pressure, can be used to promptly relieve a tension pneumothorax.
- ROPE Protocols<sup>2</sup>
  - “A Simple Pneumothorax is accompanied with decreased or absent breath sounds and is not an indication for chest decompression.”
  - A Tension Pneumothorax – “Medical Control consultation on Needle Decompression may be considered, but is not required, especially when the patient is in cardiac arrest with penetrating trauma.”
- Objective of this study was to evaluate the use of needle thoracostomies in the trauma population by prehospital medical providers

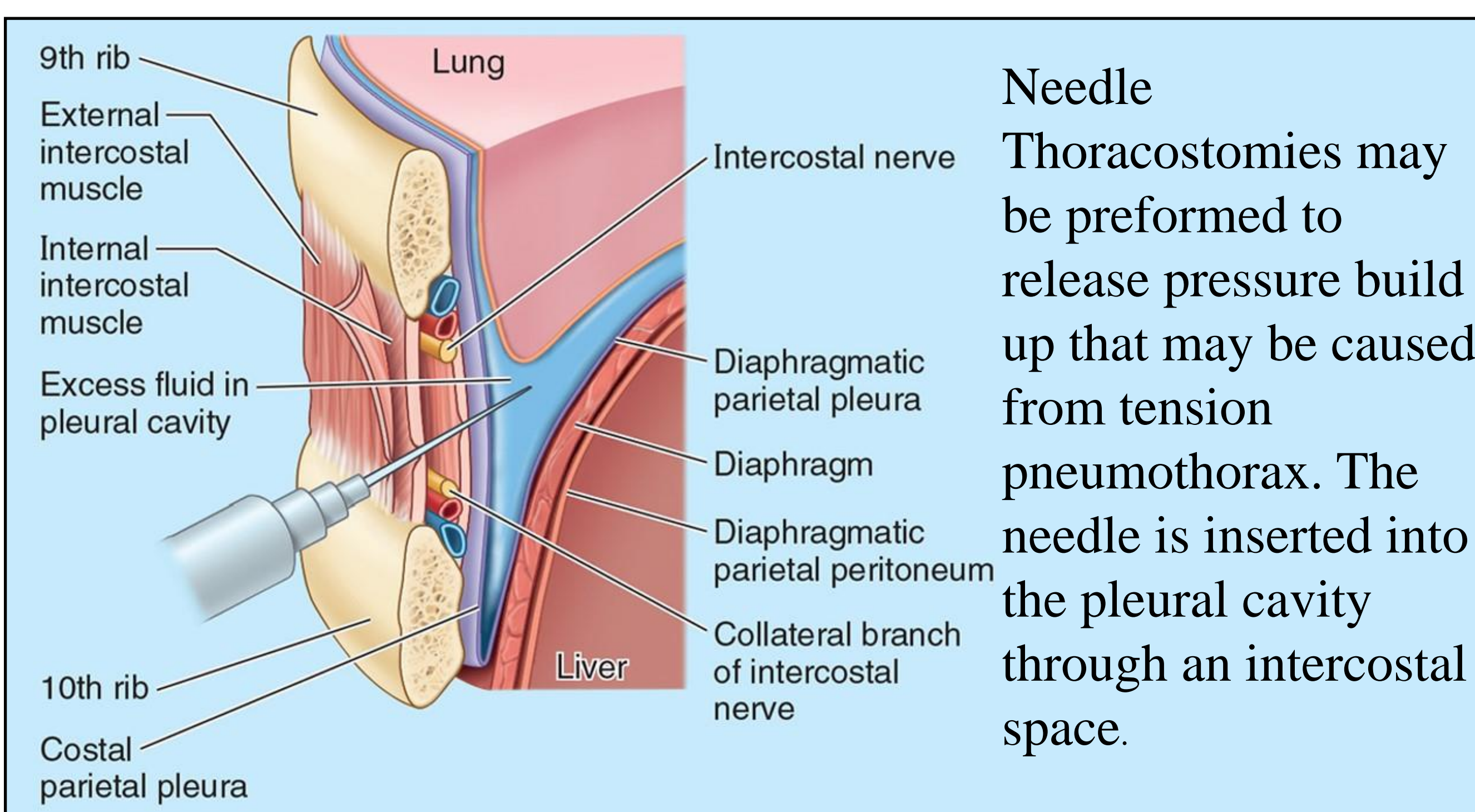
## Methods

- Retrospective chart review of adult trauma patients with prehospital needle thoracostomies presenting to an urban Level 1 Trauma Center over a four-year period
- Prehospital needle thoracostomy cases were reviewed by two independent expert panels of trauma surgeons and paramedics
- Unnecessary needle thoracotomies were defined as patients who did not have clinical signs of tension pneumothorax.

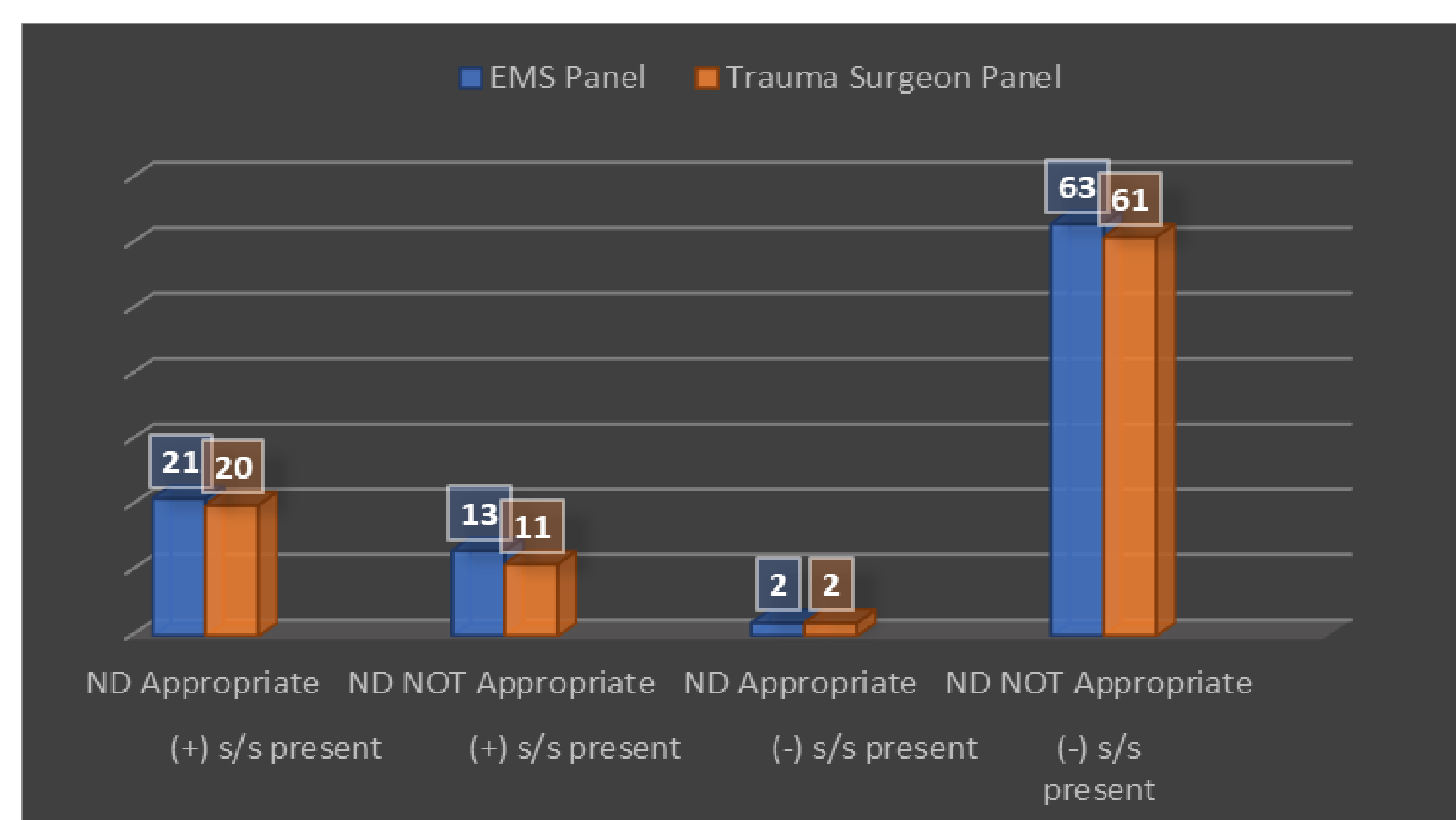
## Pulmonary Collapse<sup>1</sup>



## Thoracentesis<sup>1</sup>



## Panel Results



## Chart Review Results

- Of the 302 needle thoracostomies reviewed, 87 were identified as being potentially unnecessary.
- The average age of this population was 37.3 years old +/- 16.7 with 91% (n=79) being male gender.
- The average injury severity score was 20.5 +/- 14.3 and 56% of the patients had a penetrating trauma mechanism.
- The average on scene time was 9.4 +/- 5.9 min. The average transport time was 13.2 +/- 8.4 min. The mortality rate was 33% (n=20/87).

## Conclusion

- Results suggested that potentially unnecessary needle decompressions are being performed in the prehospital setting
- The next step will be to refine existing guidelines for prehospital needle decompressions to avoid potentially unnecessary procedures for trauma patients

## References

1. Dalley, A. F., R., A. A. M., Moore, K. L., & Moore, K. L. (2023). Moore's Clinically Oriented Anatomy (Ninth Edition). Wolters Kluwer.
2. Region One Metropolitan Ambulance Council Clinical Committee. (2021). Region One Protocol Effort.