



# Prehospital Amputation: An Experimental Comparison of Techniques



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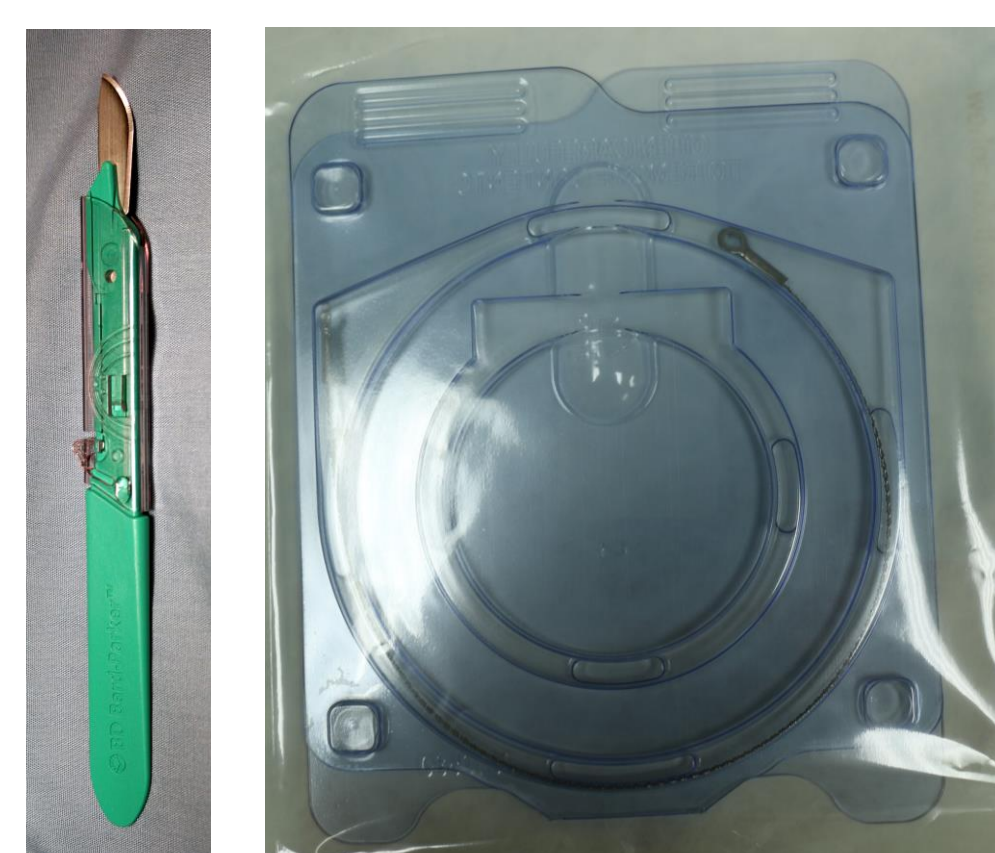
## INTRODUCTION

Prehospital limb amputation is a rare, but potentially life-saving intervention. When adequate resuscitation is not possible due to difficult patient access, hemodynamically unstable patients may benefit from an emergent prehospital amputation. There have been a limited number of case reports detailing prehospital amputation<sup>[1-4]</sup>. Furthermore, there has only been one experimental trial<sup>[5]</sup>. Leech et al. explored prehospital-friendly methods of amputation on human cadavers; however, due to a small sample size of four trials, the data has limited reliability.

**Objective:** Experimentally compare three prehospital amputation techniques on porcine legs to compare time to procedure completion, rates of instrument malfunction, and cleanliness of cut.

## METHODS

- Three participants: emergency medicine physician, paramedic, and medical student.
- Each participant performed 3 amputations of each technique, resulting in n=27 amputations.



**Technique 1:** Scalpel to make a circumferential incision in soft tissue, and Gigli wire saw to cut through bone.

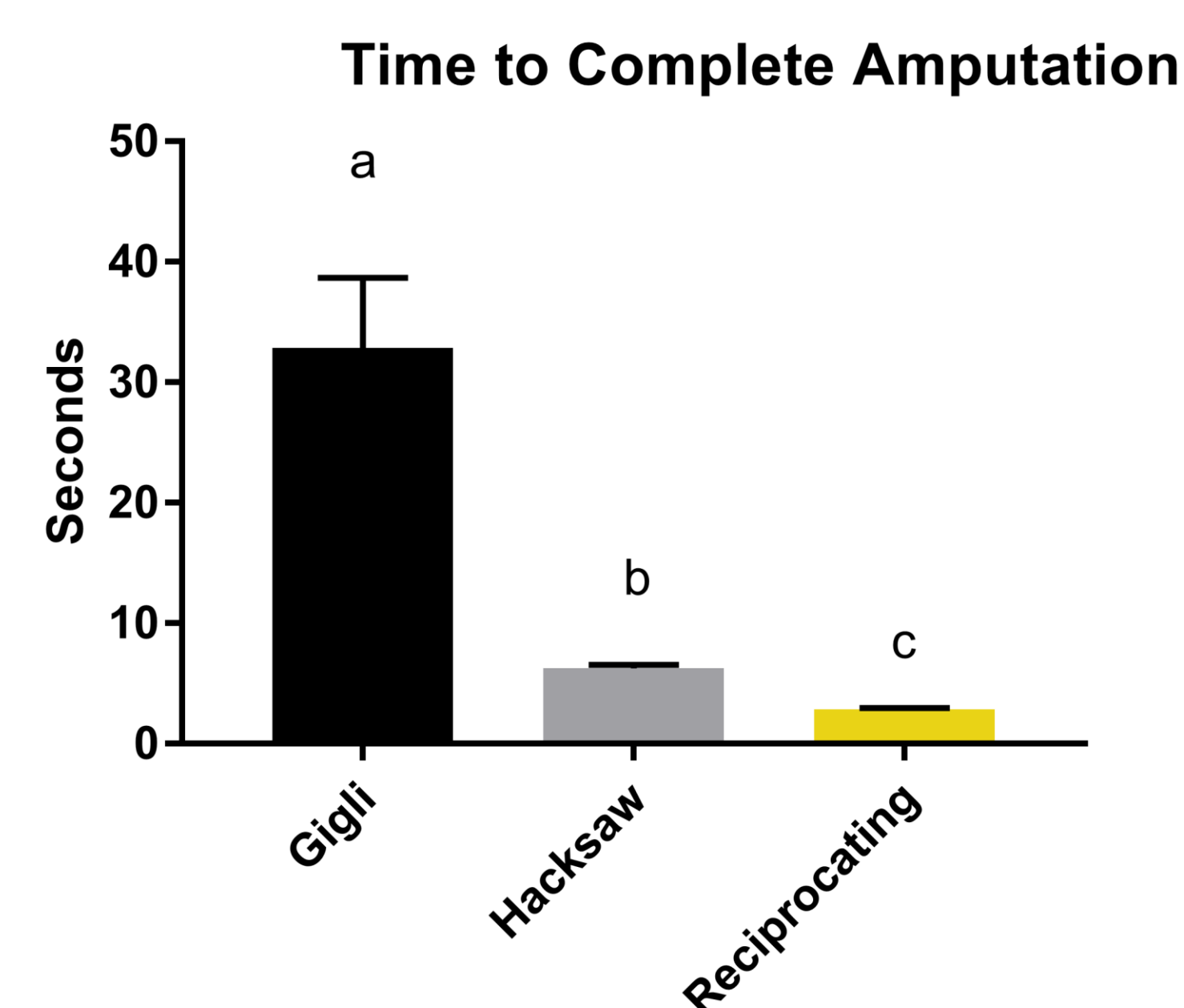


**Technique 2:** Hacksaw to cut through soft tissue and bone.

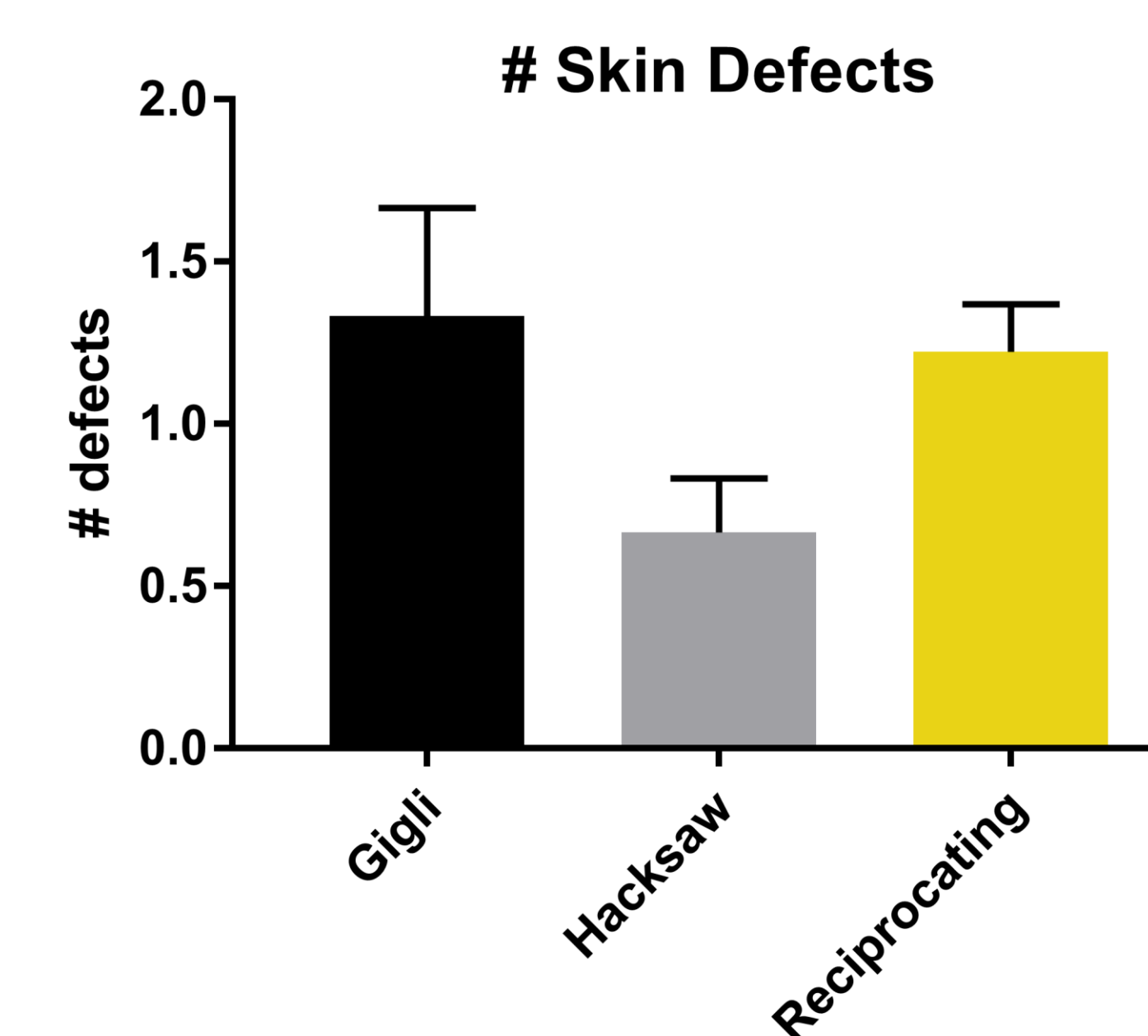


**Technique 3:** Recip. saw to cut through soft tissue and bone.

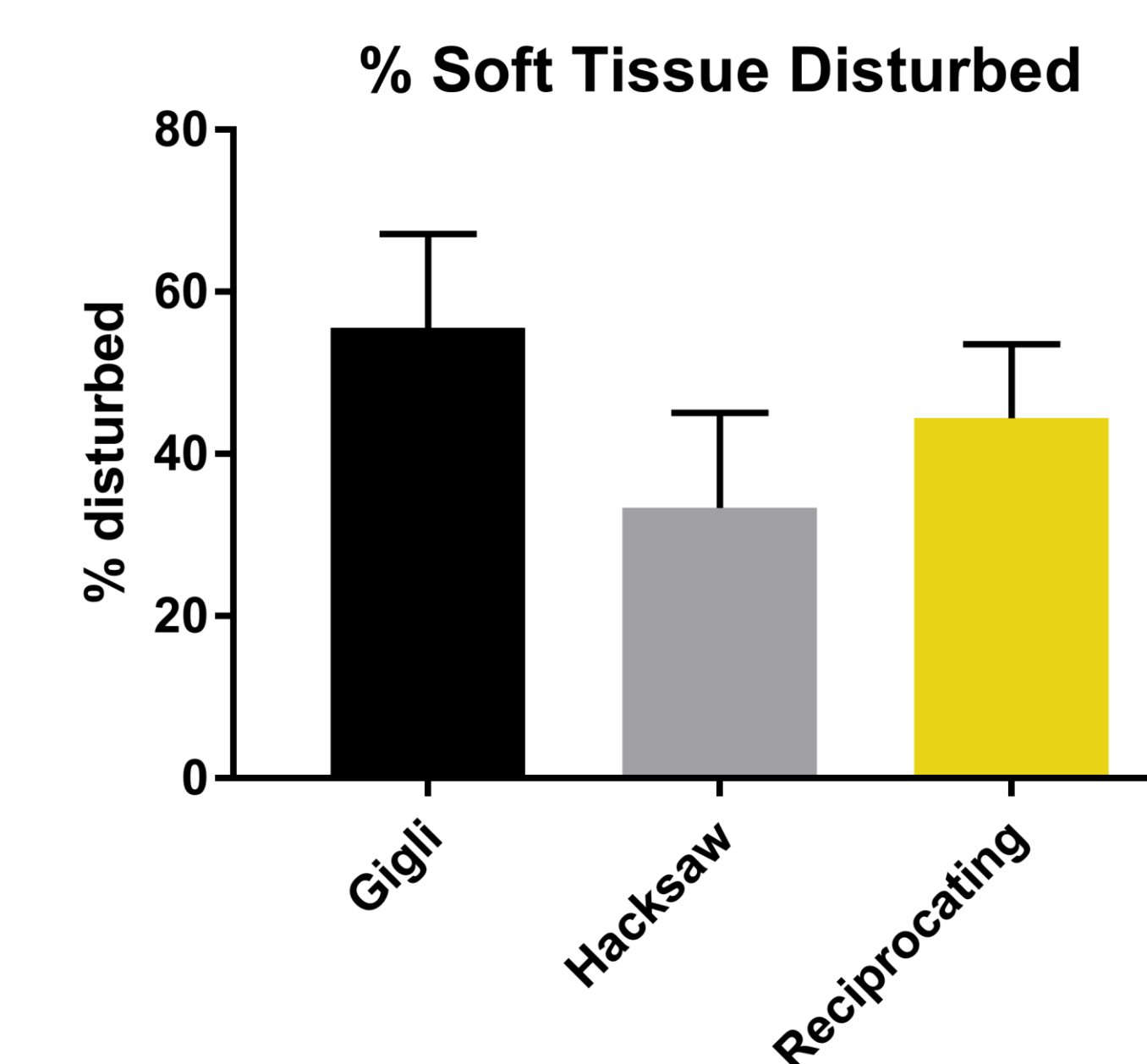
## RESULTS



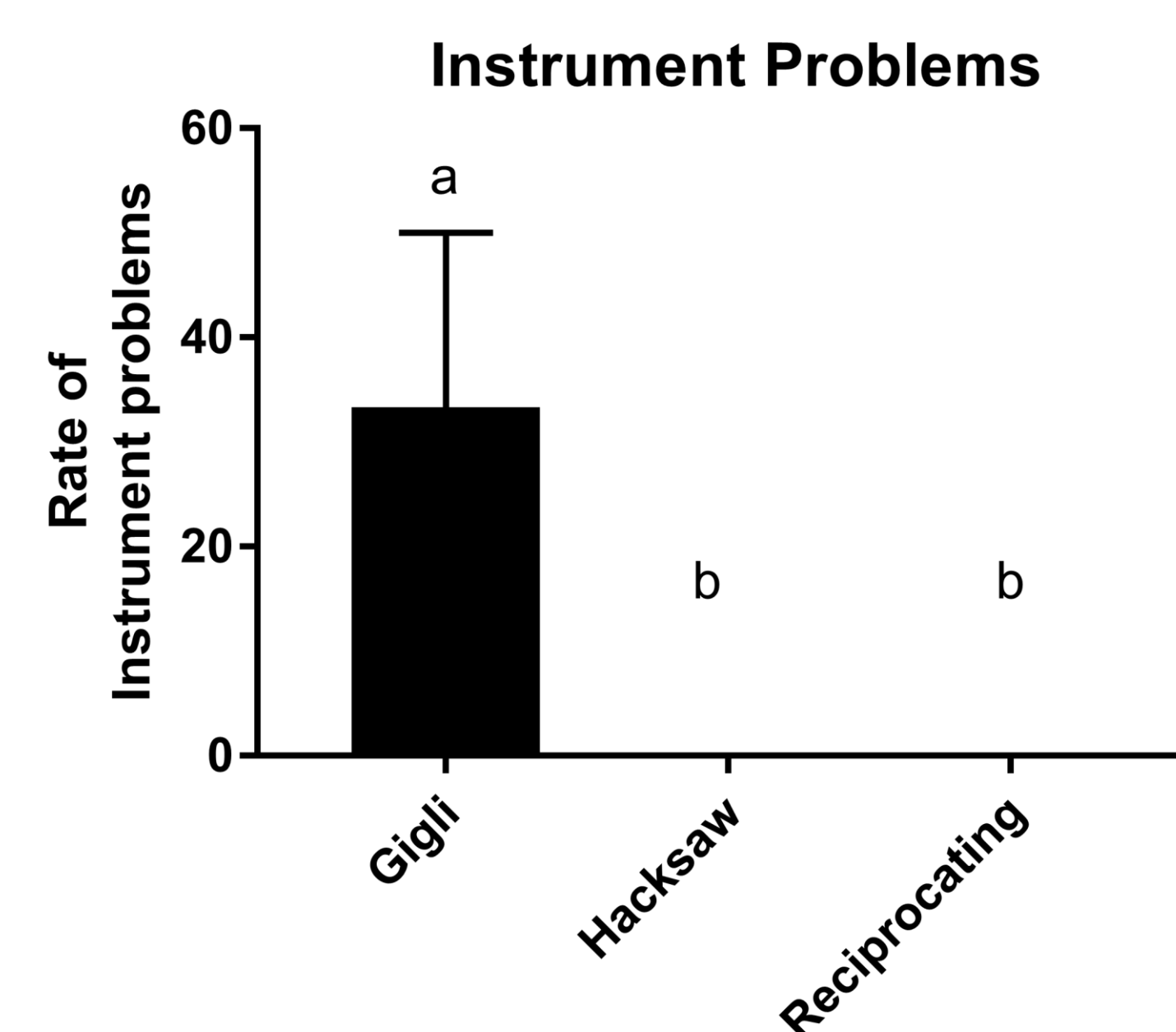
**Figure 1.** Time was measured from start of cut to complete amputation.



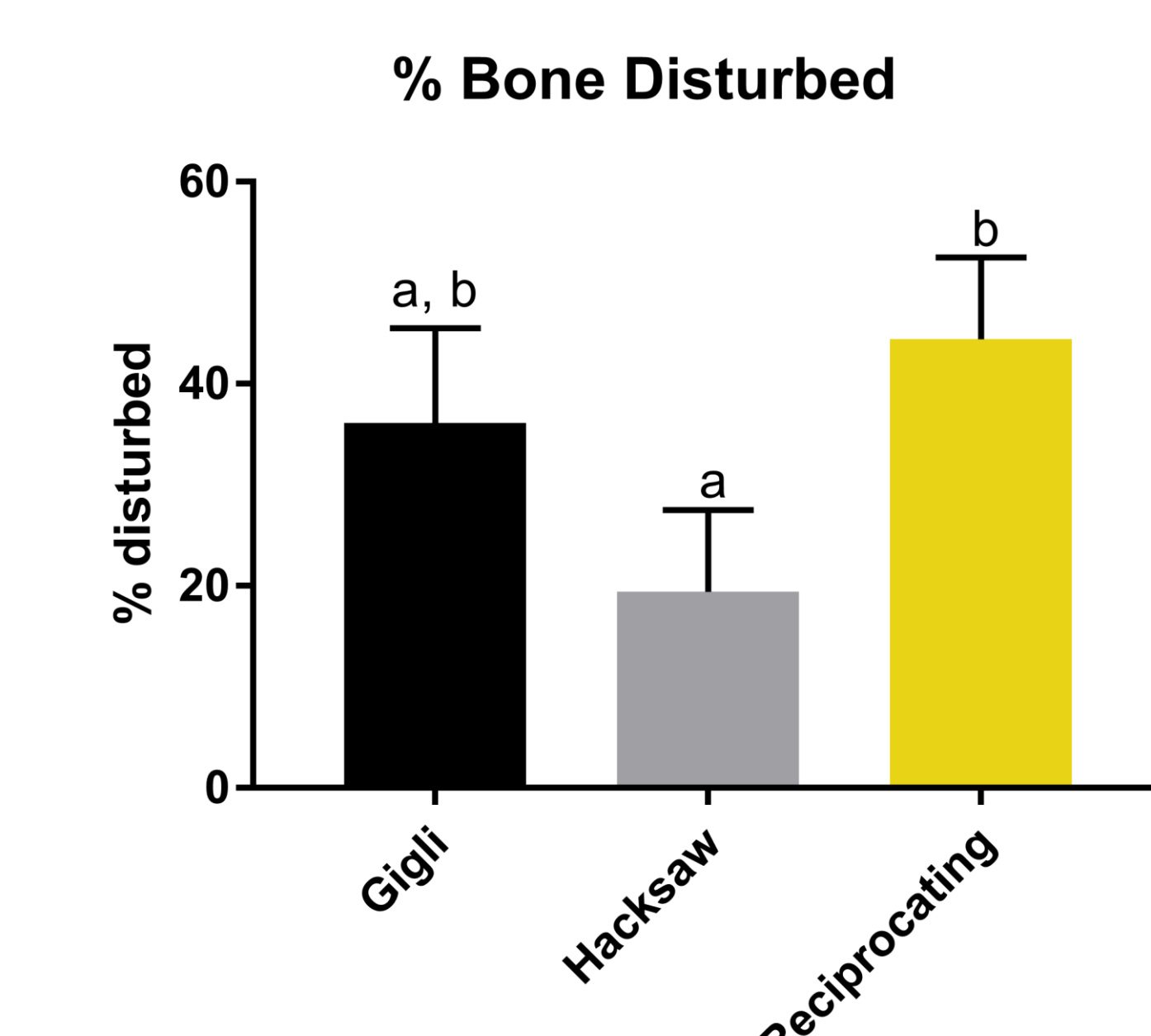
**Figure 3.** Skin defects were defined as number of ragged edges following amputation.



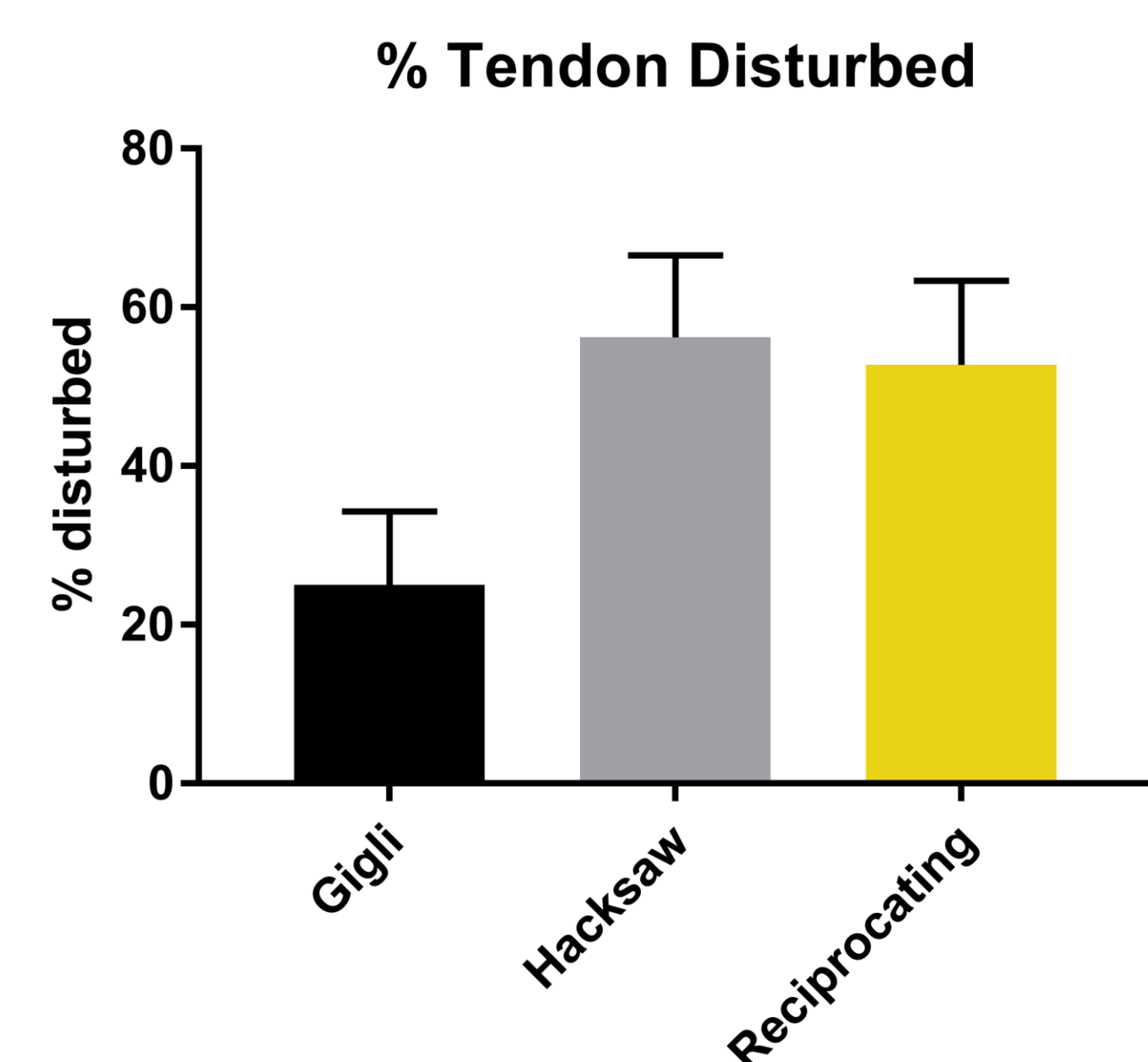
**Figure 5.** Soft tissues disturbance was subjectively graded based on precision of cut.



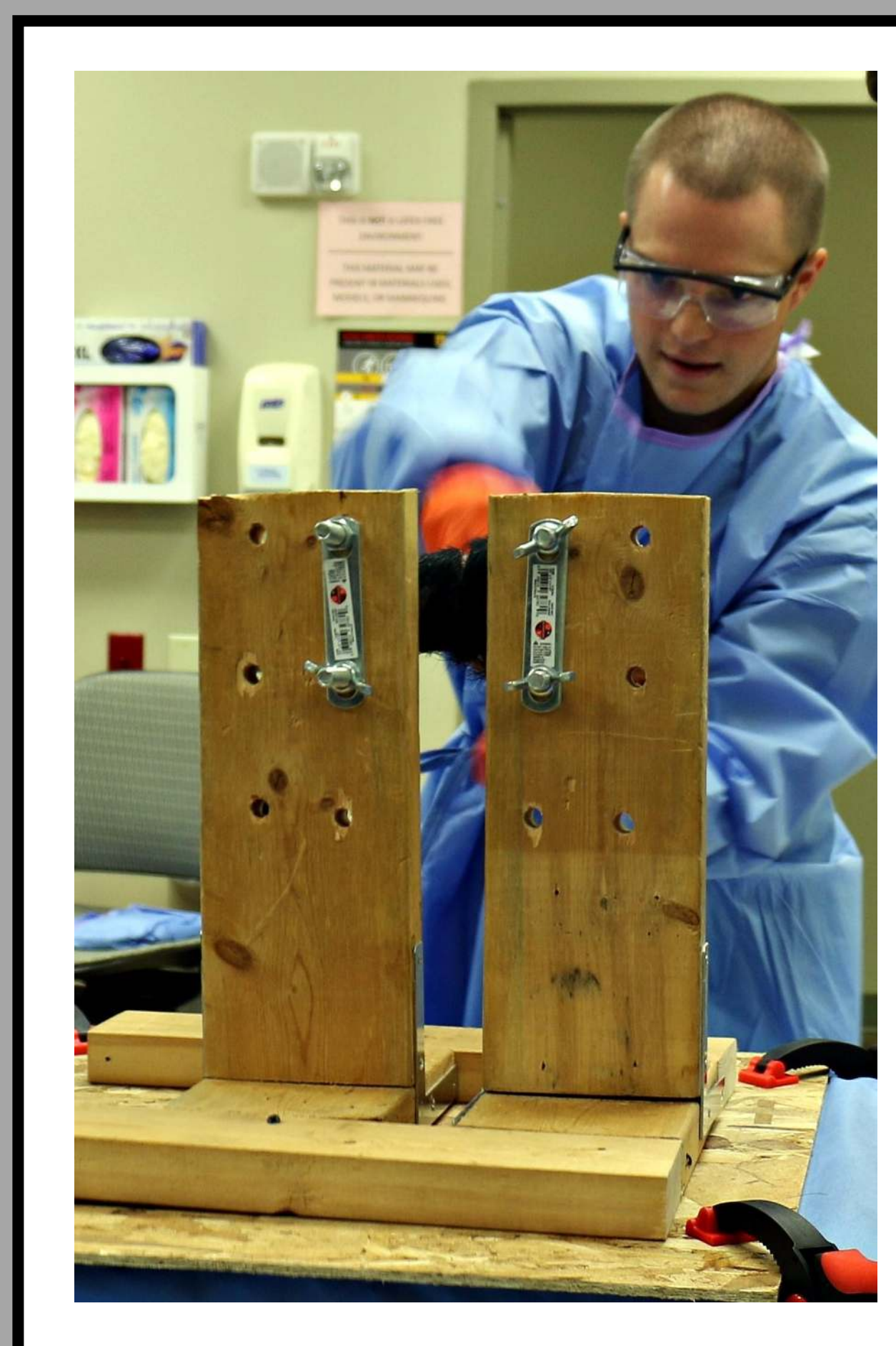
**Figure 2.** Instrument problems were defined as unexpected malfunctions. Gigli Saw Technique had an instrument problem on 3/9 trials.



**Figure 4.** Bone disturbance was subjectively graded based on number of gross bone deformities.



**Figure 6.** Tendon disturbance was subjectively graded based on precision of cut.



## DISCUSSION

We propose the mnemonic 'OH CRAP' for prehospital amputation of an extremity. We believe this mnemonic will help prehospital providers remember the key steps of this procedure during a stressful and time-critical resuscitation.

- Optimize resuscitation
- Have equipment ready
- Contact medical control
- Remove patient's clothing
- Amputate
- Post-amputation care and transport

## CONCLUSION

- Prehospital limb amputation is an option of last resort only to be implemented in critical situations.
- Amputation with a hacksaw or reciprocating saw may result in faster completion of the time-sensitive procedure with fewer instrument malfunctions.
- Lack of difference in skin, soft tissue, and tendon disturbance between techniques demonstrates there may be multiple viable instruments for prehospital amputation; however, further investigation is warranted.

## REFERENCES

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