

A service evaluation of inhaled methoxyflurane (Pentrox) for the manipulation of acute traumatic orthopaedic/joint injuries by a single UK Helicopter Emergency Medical Service (HEMS)

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Introduction

Methoxyflurane (Pentrox) is an inhaled anaesthetic agent. When administered in escalating doses it provides analgesia followed by sedation.

The aim of this study was to evaluate the success rate of Pentrox as the sole sedative agent for the reduction of acute traumatic orthopaedic injuries in the pre-hospital setting.

Methods

- Retrospective observational study.
- Consecutive data collection from 2019 to 2021 inclusive.
- Statistical analysis was performed using Chi-squared test for categorical data.

Inclusion criteria

- Adult trauma patients who were administered Pentrox as the sole sedative agent for the purpose of joint manipulation and/or fracture reduction.

Exclusion criteria

- Pentrox administered for analgesia only.
- Injury not requiring manipulation.
- Other sedation or regional anaesthesia administration prior to Pentrox.

Primary Outcomes

- Percentage successful clinical reduction using Pentrox as the sole sedative agent.
- Secondary outcomes/subgroups:
 - Does success rate vary with patient age?
 - Does success rate vary with specific injuries?
 - Does success rate vary with administration of opiates prior to reduction?
 - Does the use of Pentrox reduce the requirement to accompany the patient to hospital?

Results

- 136 patients met the inclusion criteria in the time period.
- 93 (68.4%) patients had a successful reduction with Pentrox sedation alone.

Subgroup analysis

- Patients over 70 years old had significantly higher success rate compared to other age groups combined (82.9% v 63.4%, p=0.03).
- Use of Pentrox sedation significantly reduced the need for a HEMS team to accompany the patient to hospital (8.3% vs 69.2%, p=0.001).
- There was a non-significant trend towards increased success in patella relocation and closed ankle fractures.
- Prior opiate administration did not significantly affect manipulation success rate.

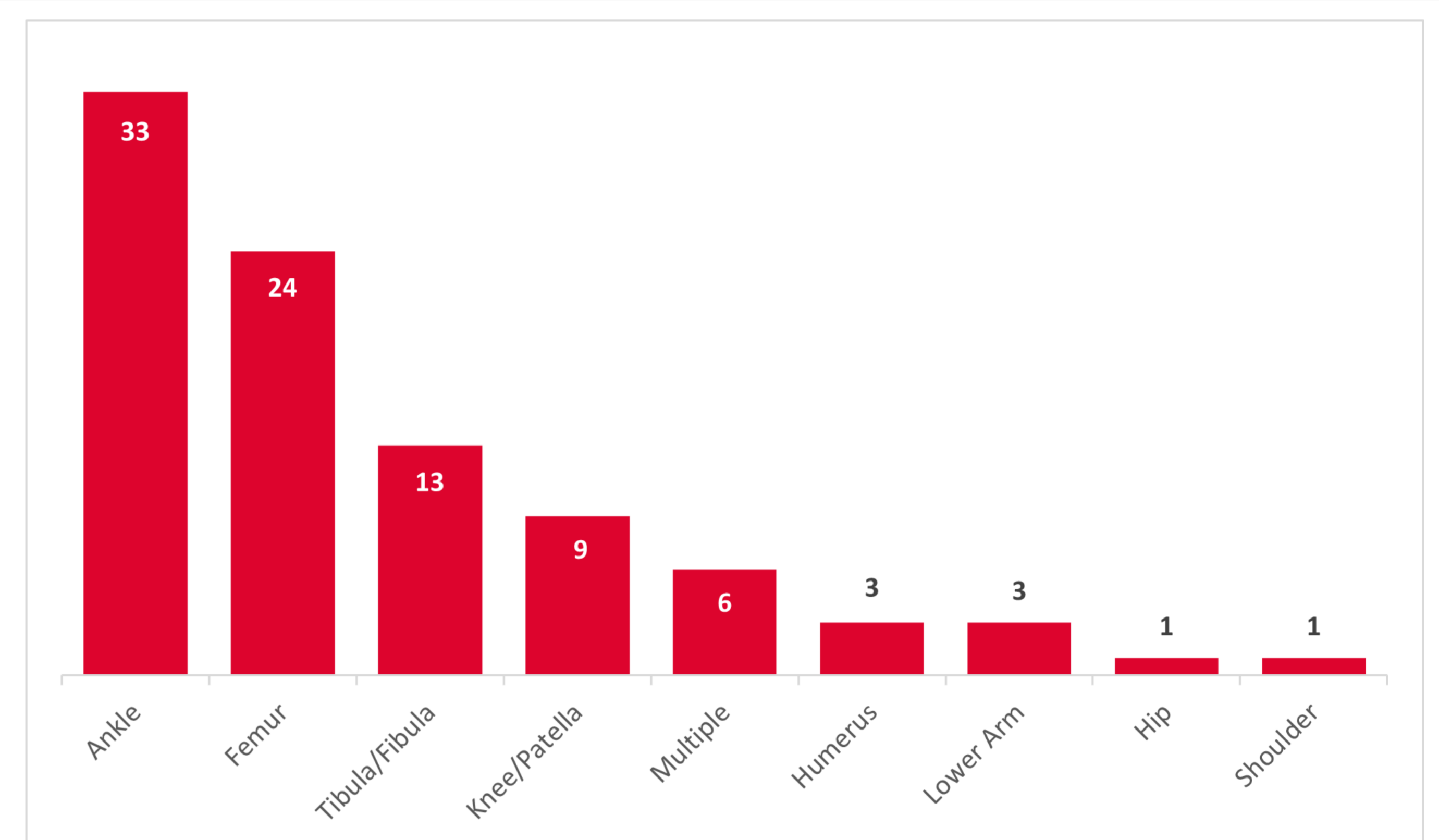


Figure 1: Location of injury when Pentrox used as sole sedative agent

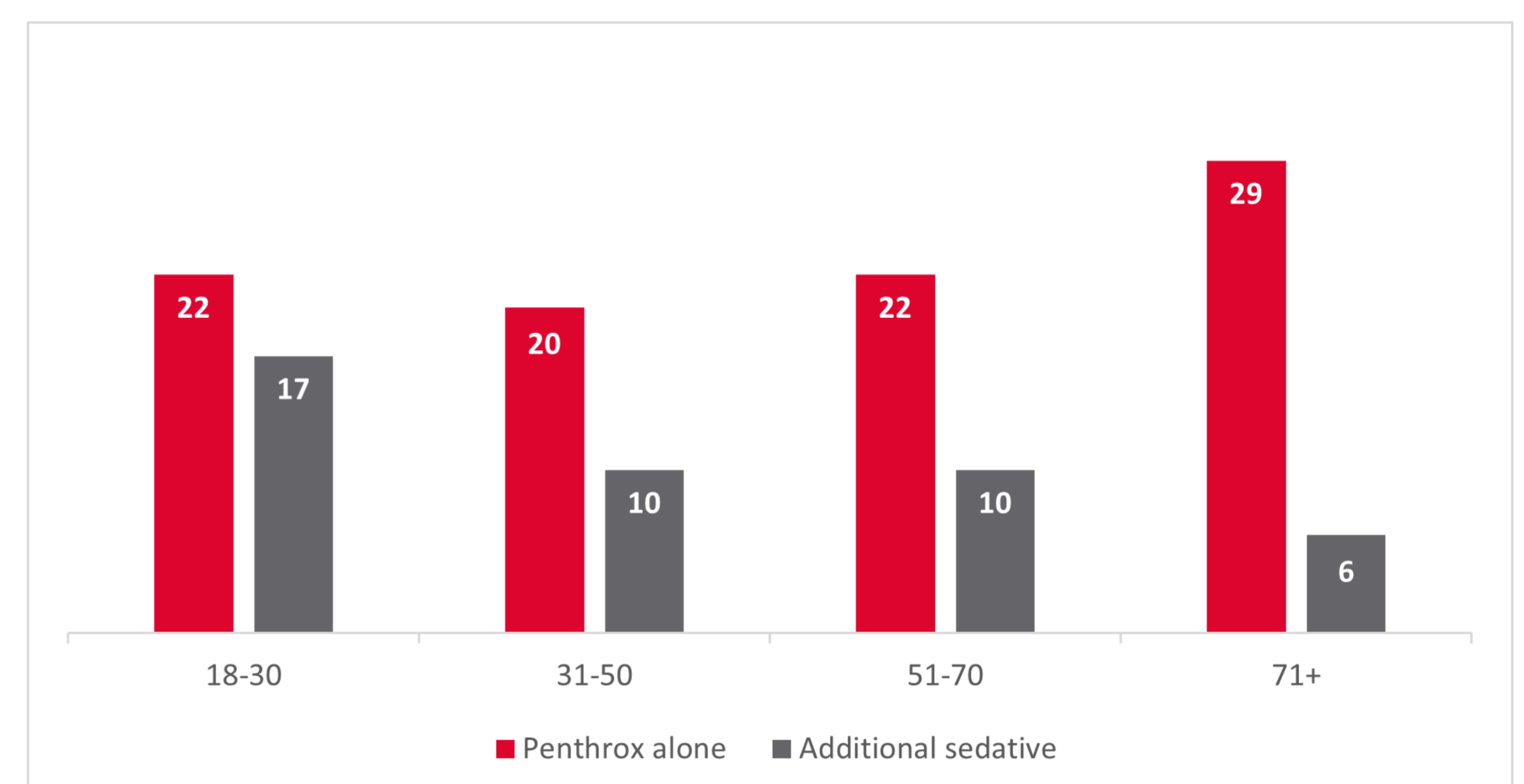


Figure 2: Pentrox as sole agent versus requirement for further sedation by age group

Conclusion

Pentrox can be successfully used as a sole agent for the manipulation and/or reduction of acute traumatic orthopaedic injuries, with increased efficacy in those aged over 70. The use of Pentrox, compared to other sedative agents, is associated with a reduced requirement for HEMS to accompany patients to hospital.

