



### MINIMAL OCCLUSIVE INTRACUFF PRESSURES OF SILICONE ENDOTRACHEAL TUBES USED IN EQUINE ANAESTHESIA

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#### Introduction

To gather data about minimal occlusive intracuff pressure of 26 mm internal diameter silicone endotracheal tubes (ETT's) with high-pressure-low-volume (HPLV) type cuffs typically used in equine anaesthesia, a cadaveric study and a randomized, prospective, clinical study were performed.

#### Materials

Part 1: Cadaver study using two adult equine (warmblood) tracheas. Part 2: Six healthy client-owned warmblood horses weighing  $484 \pm 39$  kg (mean  $\pm$  SD).

#### Methods

Part 1: Liquid seal pressure of the ETT cuff of eight ETT's (22, 24, 26 and 30 mm internal diameter, two tubes per size) was determined in two trachea specimens. Iodine-stained solution was instilled proximal to the ETT cuff. Leakage was checked visually, assisted by colour-change of starch-containing paper.

Part 2: Six horses were anaesthetized for various surgical procedures while intubated with a size 26 ETT. Fibreoptic endoscopy of the tracheal mucosa was performed at intubation and extubation. Minimal occlusive intracuff pressure to prevent gas leakage was first determined manually and subsequently by guidance of IR analysis for isoflurane leakage. In three horses, intracuff pressure was maintained at minimal occlusive pressure, while intracuff pressure was increased to 200 mmHg in the other three horses.

#### Results

Part 1: Liquid seal pressure decreased when ETT internal diameter increased ( $p=0.019$ ). Part 2: minimal occlusive pressure was  $155 \pm 22$  mmHg (mean  $\pm$  SD) when determined by manual leak detection, and  $169 \pm 17$  mmHg based on IR analysis of isoflurane leakage. Five out of six horses showed increased tracheal endoscopic scores after extubation, with no difference in score between groups.

#### Conclusion

Intracuff pressures are related to ETT size for silicone large animal ETT's fitted with HPLV cuffs. Appreciable inhalant anaesthetic leakage was still present when a seal was deemed present based on operator detection. Findings in part 2, some contradicting previous literature<sup>1</sup>, highlight the importance of formal research on (the effects of) ETT cuff pressures in horses.

#### References

1. Touzot-Jourde G, Stedman NL, Trim CM, The effects of two endotracheal tube cuff inflation pressures on liquid aspiration and tracheal wall damage in horses. *Vet Anaesth Analg* 2005;32(1):23-9