

Introduction

Problem: Lack of tip depth control of airway introducers and exchange catheters is the prime cause of airway injuries and failed intubations.

Hypothesis: Catheters with a qualitative depth control system, designed to be monitored at the level of the vocal cords, will allow better catheter tip depth control during airway procedures.

Methods and Materials

22 faculty anesthesiologists or senior residents performed 3 endotracheal tube exchanges in an airway manikin each with a differing visual feedback.

Data Gathering

All exchanges were monitored in two ways:

- 1) All airway exchange catheters were fitted with a magnet in the tip and a magnetometer was used to monitor tip depth in the trachea through out all exchanges;
- 2) A video, at the level of the glottis, was taken of all exchanges.

Types of visual feedback during exchanges

Three exchanges were performed by each subject:

- 1) Normal exchange catheter with no visual feedback at the level of the cords.
- 2) Video laryngoscope assisted exchange with a normal exchange catheter
- 3) Video laryngoscope assisted exchange with an exchange catheter color zoned qualitative depth control system monitored at the level of the glottis

End points

- 1) Time to complete procedure
- 2) Time in Bronchus (10 cm or more below the cords)
- 3) Shallowest point during procedure
- 4) Deepest point on initial insertion of exchange catheter
- 5) Deepest point during entire procedure
- 6) Number of incursions into the bronchus

3 Exchange Types

Exchange 1

Blind
Normal AEC



Exchange 2

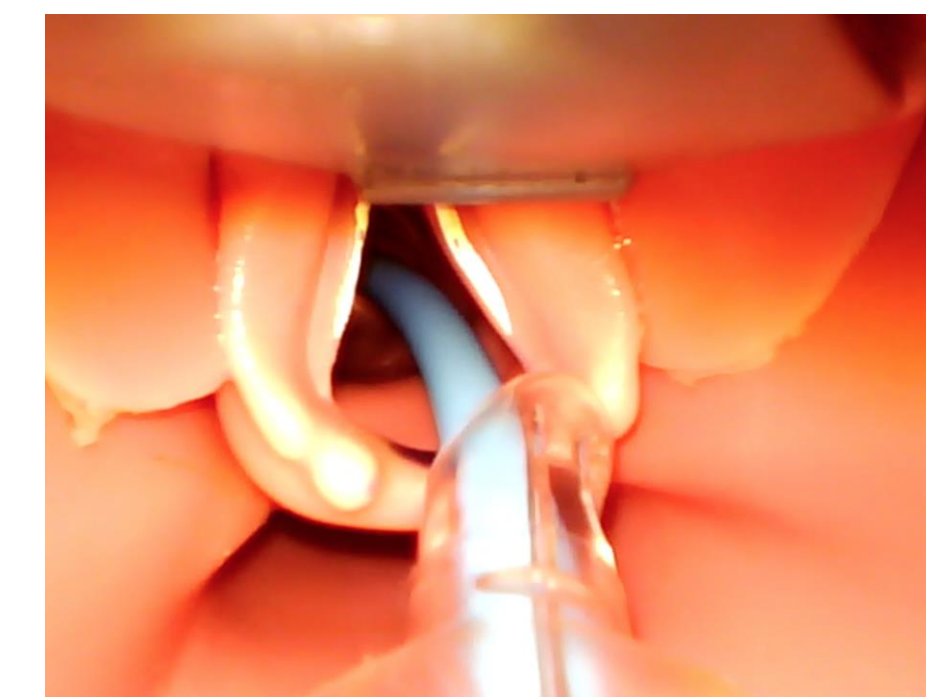
Video assisted
Normal AEC



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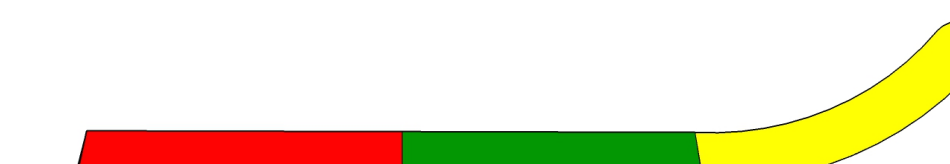


Exchange 3

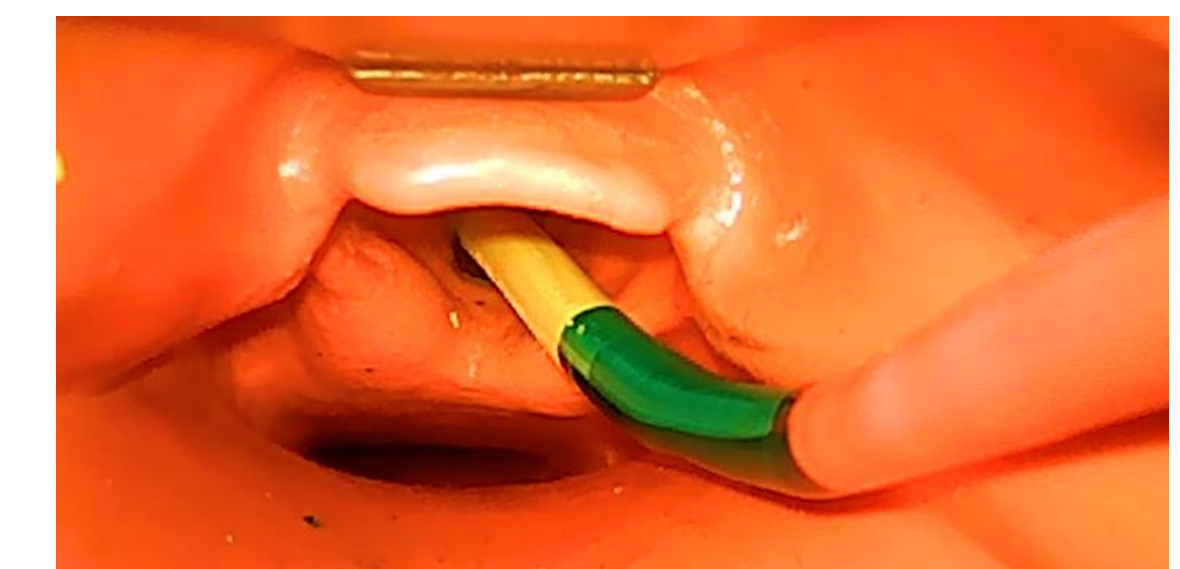
Video assisted
Color Zoned AEC



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Results

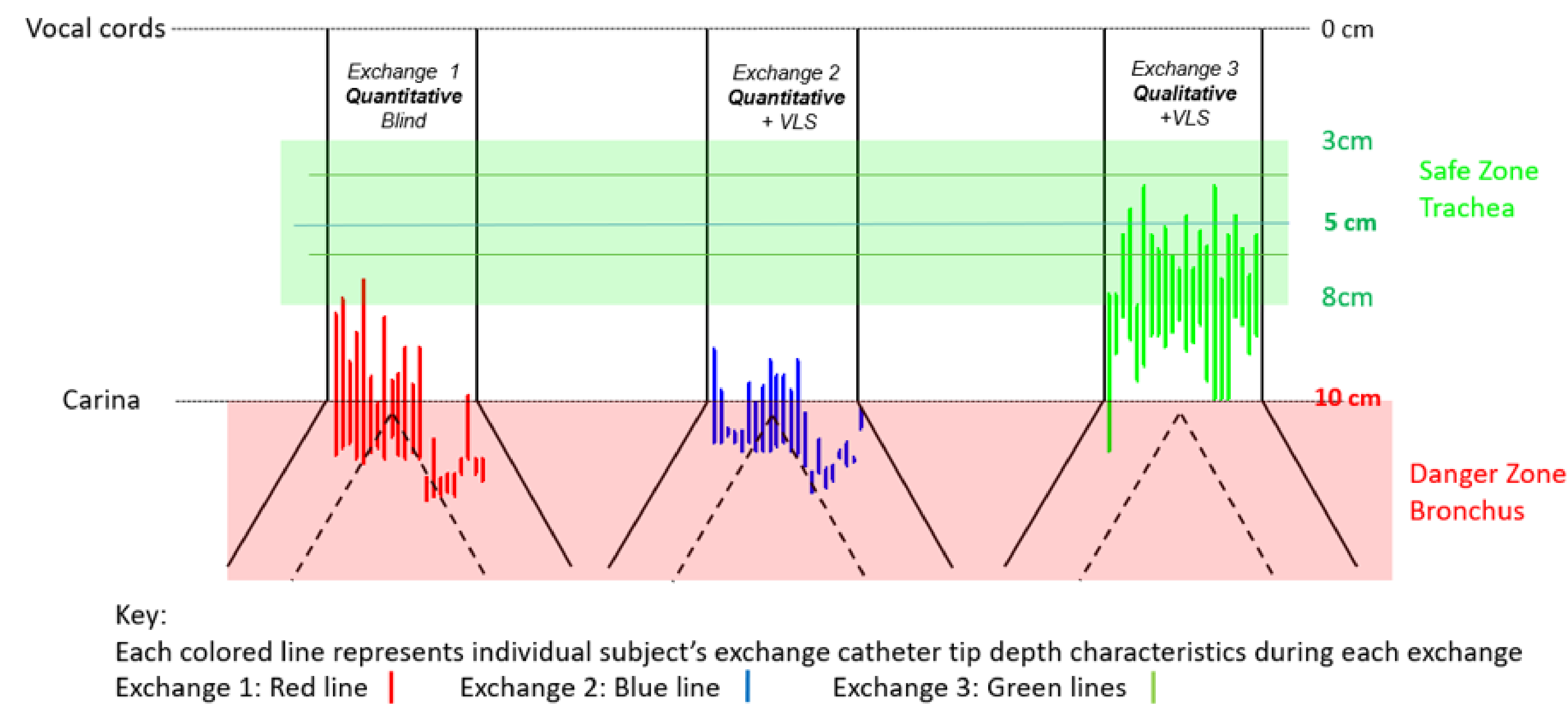


Figure 1: CATHETER TIP DEPTH IN TRACHEA AND BRONCHUS DURING AN ENDOTRACHEAL EXCHANGE WITH 3 DIFFERENT DEPTH MONITORING TECHNIQUES

Conclusions

Airway exchange catheters with qualitative color zoned depth markings can decrease tip travel below the carina when used with a video laryngoscope during endotracheal exchanges in an airway manikin. Improved catheter depth control may lead to safer endotracheal exchanges in humans.

Contact

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Disclosures

Sean Runnels and Benjamin Fogg hold shares in Through The Cords LLC

References

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