Development of Sub-optimal Airway Protocols for the International Space Station (ISS) by the Medical Operation Support Team (MOST)

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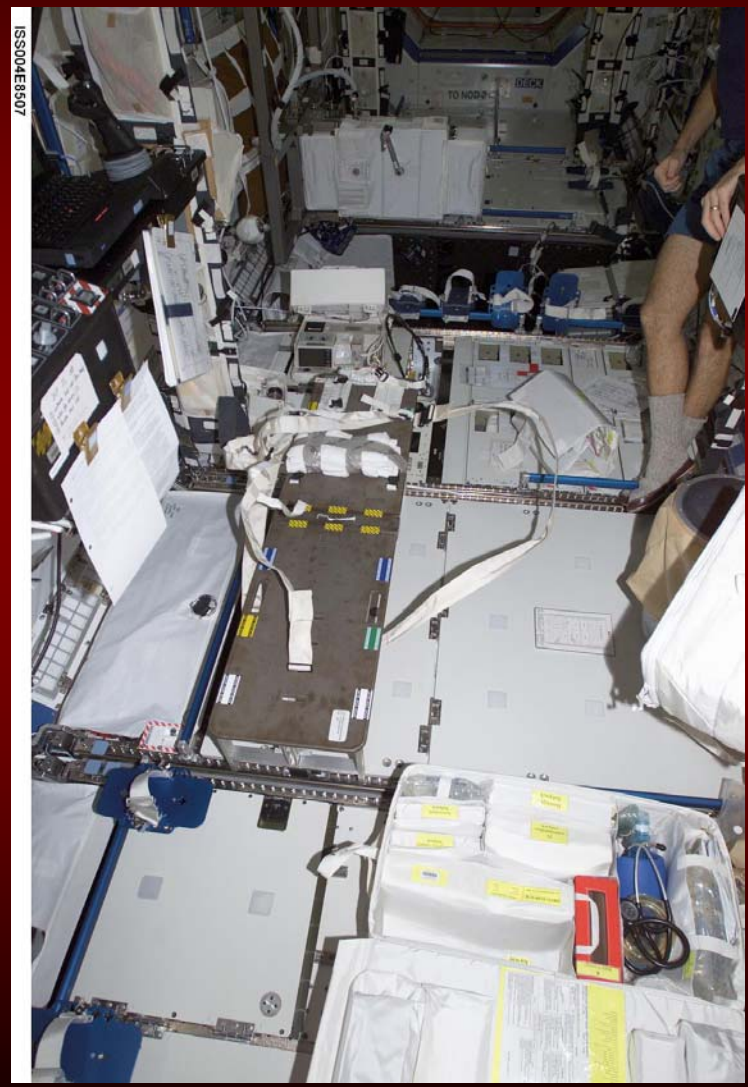
Overview

- Background
- Methods
- Review of Techniques
- Findings
- Conclusion

Background

- Airway management techniques are necessary to establish and maintain a patent airway while treating a patient undergoing respiratory distress.
- There are situations where such settings are suboptimal, thus causing the caregiver to adapt to these suboptimal conditions.
- Such occurrences are no exception aboard the International Space Station (ISS).



Background

- The NASA flight surgeon (FS) and NASA astronaut cohorts must be ready to adapt their optimal airway management techniques for suboptimal situations.
- Previous microgravity experiments by the MOST and other investigators have evaluated several techniques for securing airways in sub-optimal positions by non-physician caregivers
  - Insertion of a supraglottic airway device (Intubating Laryngeal Mask Airway (ILMA))
  - direct laryngoscopy with insertion of a cuffed endotracheal tube.

Background

- The MOST had members of both the FS and astronaut cohorts evaluate two oral airway insertion techniques for the Intubating Laryngeal Mask Airway (ILMA) to determine whether either technique is sufficient to perform in suboptimal conditions within a microgravity environment.

Methods

- All experiments were conducted in a simulated microgravity environment provided by parabolic flight aboard DC-9 aircraft.
- Each participant acted as a caregiver and was directed to attempt both suboptimal ILMA insertion techniques following a preflight instruction session on the day of the flight and a demonstration of the technique by an anesthesiologist.

Optimal ILMA Insertion Technique ‘Kneel’

‘Cradle’ Technique

Video of ‘Cradle’ Technique

‘Trap Doerr’ Technique

Video of Trap Technique

Study Findings

	# of Trials	Successful	% Successful
Kneel	14	14/14	100
Cradle	15	12/15	80
Trap Doerr	17	17/17	100
Total	**46**	**43/46**	**94**

Conclusion

- The study demonstrated the use of airway management techniques in suboptimal conditions relating to space flight.
- Use of these techniques will provide a crew and the flight surgeons with options for using the ILMA to manage airway issues aboard the ISS.
- Although it is understood that the optimal method for patient care during space flight is to have both patient and caregiver restrained, these techniques provide a needed backup should conditions not present themselves in an ideal manner.

Questions?