26399 - THE EFFECTS OF A PERSONAL PROTECTION SYSTEM ON THE PERFORMANCE OF A SIMULATED ENDOTRACHEAL INTUBATION

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INTRODUCTION: The threat of transmission of highly virulent diseases, such as severe acute respiratory syndrome (SARS), has resulted in the need for medical personnel to perform high risk aerosol generating procedures, including endotracheal intubation, while wearing personal protection systems (PPS).(1) We aimed to compare the ability of experienced volunteers to perform simulated rapid sequence endotracheal intubation wearing either routine personal protective equipment (PPE) or enhanced precautions consisting of a personal protective system (PPS) as defined by the Ministry of Health and Long term Care of Ontario.(2)

METHODS: Following IRB approval 12 staff anaesthesiologists were recruited to a prospective randomized crossover study comparing standardized simulated rapid sequence endotracheal intubation of a mannequin while wearing either PPE or PPS systems. The PPE system consisted of a surgical gown, N95 mask, face shield, hair cover and gloves. The PPS was a two layered system consisting of an inner layer of hooded coveralls, shoe covers, N95 mask, goggles, hair cover and surgical gloves and an outer layer of a positive air pressure respirator hood (PAPR), HEPA air filter unit, fluid resistant surgical gown, shoe covers and surgical gloves. Time to complete the simulation from the start of donning the equipment until securing the endotracheal tube, time for and success in performing the intubation component were recorded. End points were strictly defined and one time keeper used throughout. Volunteers completed a feedback questionnaire after each simulation. The timing variables were compared using the standard method for AB/BA crossover studies as described by Fleiss. The proportion of endobronchial or oesophageal intubations was compared between systems using the exact McNemar's test for paired data.

RESULTS: Total time to complete the simulation was 193 seconds (95% CI 171-215 seconds; $p < 0.001$) longer for the PPS. There was no significant difference in time for the intubation component and no statistically significant differences in endobronchial intubations between the systems. There were no recorded oesophageal intubations for either system. (Table)

DISCUSSION: Wearing of a personal protection system significantly increased overall procedure time but did not impair performance in terms of intubation time or success rates in a simulated endotracheal intubation.

REFERENCES: 1. Can J Anesth 2003 50: 989-997

2. Ontario MOHLTC: Directive HR04-13

Table Mean times in seconds (standard deviation) taken to complete the stages of the simulation and number of esophageal or endobronchial intubations, PPE versus PPS.

Procedure	PPE (n=12)	PPS (n=12)	P-value
Time to don equipment	91.5 (19.4)	278.2 (50.7)	<0.001
Intubation time	33.0 (12.4)	30.92 (7.1)	0.43
Time to end tidal CO ₂	146.4 (30.2)	336.7 (62.0)	<0.001
Taping time	16.0 (7.3)	18.7 (7.6)	0.027
Total Time	162.42 (34.3)	355.4 (66.2)	<0.001
Endobronchial intubations	1	5	0.22
Esophageal intubations	0	0	