

Evaluation of four airway training manikins as patient simulators for the insertion of eight types of supraglottic airway devices (SADs).

K Jackson, J Silsby, G Jordan and T M Cook.

Department of Anaesthesia, Royal United Hospital, Combe Park, Bath BA1 3NG, UK.

Introduction. It is not known whether different manikins perform equally for supraglottic airway (SAD) insertion : we evaluated four 'new' manikins: Airsim™ (Trucorp, Ireland), "Bill 1"™ (VBM, Germany), Airway Management Trainer™ (Ambu, UK) and Airway Trainer™ (Laerdal, Norway), with 8 SADs: Streamlined Liner of the Pharynx Airway(SLIPA), Laryngeal Tube(LT), LT Disposable (LTD), LT Suction II (LTS), Airway Management Device (AMD), Cobra Perilaryngeal Airway (Cobra PLA), Combitube and i-Gel. Study aims were to determine 1) which manikin performs best for the 8 SADs 2) which manikin is best for each SAD 3) to examine variations in SAD performance.

Methods. Ten volunteer anaesthetists inserted each SAD into four manikins in random order, twice. Each insertion was scored: insertion: 2=easy, 1=difficult, 0=impossible, definite end point: 1=yes, 0=no, device remains in midline after deployment 1=yes, 0=no, able to ventilate 1=yes, 0=no. Maximum SCORE = 5. After inserting each SAD into all four manikins the volunteers RANKED the manikins for that device. Friedmann ANOVA compared SCORE and RANK data. *post-hoc* analysis used Wilcoxon signed rank test. P<0.05 (corrected for multiple comparisons) was taken as significant.

Results. Overall performance. ANOVA analysis showed statistically significant performance differences between manikins (SCORE p<0.0001, RANK p<0.0001). *Post hoc* analysis of SCORE and RANK data showed significant differences between four manikins combinations.

Overall performance of each manikin for all the SADs investigated.

	Airsim (Trucorp)	"Bill 1"(VBM)	AMT (Ambu)	AT(Laerdal)
Scores	722	597	606	649
Median	5	4	4	4
Ranks	289	410	468	417
Median	1	2.5	3	2

These results and table 1 data gives a ranking of 1st Trucorp, 2nd Laerdal 3rd and 4th VBM and Ambu. Differences between VBM/Ambu were inconsistent and do not reach statistical significance.

Performance with individual SADs. Table 2 presents statistically significant results (same methods)

Manikin ranking by device. '>' indicates 'performs better than'

	SCORE scores	RANK scores
SLIPA	T, A, V all > L	T, A, V all > L
LT	T >V and A; L>V	T and L>V and A
LTD	T>V and A; L>A	T and L>A and V
LTS	T>A and V; L and A> V	V,A>L
AMD	T>L and A>V	T>L; A>V
Cobra	No significant differences	T>A
Combitube	T>V and A; L>A	T and L>A and V
I-Gel	No significant differences	No significant differences

SAD performance. Sums of total objective sum scores for each SAD are shown below.

Conclusions. This study has shown unequal manikin performance. Considering a single manikin for training with these eight SADs the Trucorp and Laerdal manikins performed better.

Device	i-gel	LTS II	Cobra	LT	LTD	AMD	Combitube	SLIPA
Score	380	345	333	331	320	295	289	281

However with performance with specific devices varied: eg with the SLIPA Laerdal's manikin performed worst. The Trucorp manikin performed adequately for all SADs and was the best for several individual SADS. Comparing the SADs the i-Gel is the easiest to insert, the SLIPA most difficult. Examining these four manikins for cLMA insertion showed similar results with Trucorp performing best¹. With this study we can now conclude that these two manikins are suitable for use for a wide variety of SADs.

References 1 Silsby J et al. Anaesthesia 2006: 61; 576-579

Acknowledgement. This project was supported by a grant from the Difficult Airway Society.