Anatomical trainer for bronchoscopy

Ranceviene D., Montvilaite A., Jakubauskaite R., Macas A.

The Department of Anaesthesiology, Lithuanian University of Health Sciences, Kaunas, Lithuania

BACKGROUND

Commercial trainers for bronchoscopy are useful for acquiring psychomotor skills, dexterity and eye-hand coordination, but the cost is a limiting factor of accessibility there. Our aim was to make a real-size anatomical model of tracheobronchial tree and investigate it's suitability for FOB training.

MATERIALS AND METHODS

A model of tracheobronchial tree was made based on anatomy textbooks and article by S. Di Domenico¹ from wire, paper, glue and paint using papier-mâché technique (Fig. 1 – 5). Photos of the trachea, carina and right bronchus were made during the FOB and put next to a real human bronchoscopy photos (Fig. 6). 54 medical students (S) performed FOB on our model and on commercial trainer after the lecture. 8 certified anaesthesiologists – experts (E) and the same students took the semi-structured interview about our made model. Differences between FOB duration on both trainers were measured by the Wilcoxon signed ranks test at $p<0.05$.

Figure 1. Wire framework.

Figure 2. Paper layer on the framework.

Figure 3. Papier-mâché technique.

Figure 4. Removal from the carcass.

Figure 5. Finished model.

Figure 6. Model (L), human anatomy (R).

RESULTS AND DISCUSSION

Almost all answers (E 8, 100%, S 49, 91%) concerning the similarity between the model and real human anatomy (in photos) were “completely similar” and “similar”. E (8, 100%) and S (54, 100%) agreed that anatomical models are necessary for training and would be worth the time spent while making them. 1 (12.5%) E preferred models to be manufactured and stated that making models are beneficial only for students who make them. 3 (37.5%) E, 31 (58.5%) S thought that it would be good for practising and gaining motor skills because of unlimited practice time. 1 (12.5%) E and 13 (24.5%) S emphasized low economical expenses. On the other hand, 1 (12.5%) E and 14 (26.4%) S stated that such model might be short-lived. Others were concerned that colour and texture, lack of cartilage rings might reduce resemblance to real anatomy (E 2, 24.5%, S 19, 35.8%).

The duration of FOB on commercial model was 7 – 176 s, mean 50.1 ± 30.01 s, median 44.0 s mode 33.0 s. 1 (1.9%) S did not complete the task. There was no significant difference in the duration of FOB between the models ($p=0.322$).

Diagram 1. Semi-structured interview.

Table 1. Duration of FOB.

Model	The duration of FOB	Mean ± standart deviaton	Median	Mode
Students model	7-384 s	51,5± 62.98 s	27,0 s	18,0 s
Commercial model	7-176 s	50,1±30,01	44,0 s	33,0 s

CONCLUSIONS

Our model was anatomically correct and made from cheap materials. The duration of FOB was not significantly different between our model and commercial one.

REFERENCES

Domenico SD et al. Inexpensive anatomical trainer for bronchoscopy. ICVTS. 2007 Jun; 567–569.

Contacts: dalia.ranceviene@gmail.com