

MEETING ABSTRACT

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Animal laboratory training improves lung ultrasound proficiency and speed

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Background

Although lung ultrasound (US) is accurate in diagnosing pneumothorax (PTX), the training requirements and methods necessary to perform US examinations must be defined.

Study objective

To test whether animal laboratory training (ALT) improves the diagnostic competency and speed of PTX detection with US.

Methods

Twenty medical students without US experience attended a 1-day course. Didactic, practical and experimental lectures covered basic of US physics, US machines and lung US, followed by hands-on training to demonstrate the signs of normal lung sliding and PTX. Each student's diagnostic skill level was tested with three subsequent examinations (day 1, day 2 and a 6-month follow-up) using experimentally induced PTX in porcine models. The outcome measures were sensitivity and specificity for US detection of PTX, self-reported diagnostic confidence and scan time.

Results

The students improved their skills between the initial two examinations: sensitivity from 81.7% (69.1-90.1) to 100.0% (94.3-100.0), and specificity from 90.0% (82.0-94.8) to 98.9% (92.3-100.0); these improvements were sustained 6 months later. There was a significant positive learning curve in choosing the correct answers ($p=0.018$), a 1-point increase in the self-reported diagnostic confidence (7.8 to 8.8 on a 10-point scale;

$p<0.05$) and a 1-minute reduction in the mean scan time per lung ($p<0.05$).

Conclusion

Without previous experience and after undergoing training in an animal laboratory, medical students improved their diagnostic proficiency and speed for PTX detection with US. Lung US is a basic technique with a steep learning curve and may be used by multiple medical specialties to accurately diagnose PTX.

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