



## Theoretical-practical training in eFAST ultrasound: analysis of effectiveness for undergraduate students

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### Abstract

The eFAST is an important bedside diagnostic tool for trauma patients. The aim of this project was to evaluate the effectiveness of short, practical training in the diagnosis of pneumothorax. Firstly, medical students (n=41) were given a pre-test consisting of photos and videos. After this activity, the students took part in a theoretical-practical class on the use of eFAST. The post-test was carried out immediately after, 30 and 60 days after the training. Descriptively, there was a 38.47% increase in the number of correct answers compared to the pre- and post-tests in the first stage and the average number of correct answers remained high (above 90%) in the following two post-tests (30 and 60 days). It is therefore necessary to invest in time-effective practical training aimed at optimizing learning and improving performance technique and diagnostic accuracy in the context of emergency medicine.

### Introduction

Extended Focused Assessment with Sonography in Trauma (eFAST) is a bedside ultrasound protocol that aims to investigate and identify pneumothorax and free fluid in the peritoneal, pericardial and pleural spaces in trauma patients. It is a fast, simple and non-invasive method that can be of great help in the early diagnosis of initial care and,

consequently, in reducing the mortality of polytrauma patients. However, this practical training has been little addressed during medical school, which directly impacts the quality of emergency service care.

### Objective

To evaluate the effectiveness of short and practical training of the eFAST protocol, with a specific approach to the diagnosis of pneumothorax, for students from the first to the fourth year of medicine with little or no previous contact with the method.

### Methodology

Theoretical and practical training was provided to medical students (n = 41), divided into two groups (21 and 20 students), studying from the first to the fourth year, with little or no prior knowledge of the eFAST protocol. The training took place in person, during the afternoon shift, in a classroom at the University Hospital of the aforementioned university. The training lasted 90 minutes and was structured as follows: application of a questionnaire, consisting of photos and videos (with and without pneumothorax), expository theoretical class,





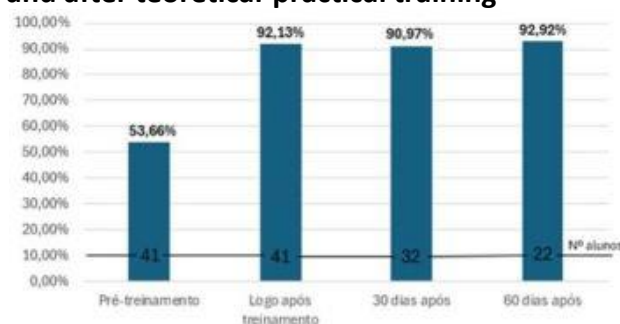
practical demonstration of the technique on a live mannequin, reapplication of the questionnaire. For the practice, the portable ultrasound devices Mindray M5 and Mobissom MDUO were used, in “B” and “M” modes. Subsequently, the students answered the questionnaire, online and synchronously, via videoconferencing platform, 30 and 60 days after the training.

## Results

The average number of correct answers in the questionnaire administered before the theoretical-practical presentation was 53.66%, ranging from 26.8% to 70.7% for the six negative images for pneumothorax, and from 41.5% to 70.7% for the three positive images. Immediately after the training, the average increased to 92.13%, ranging from 82.9% to 100% for the negative images, and 82.9% to 92.7% for the positive images. The increase was 38.47%. After 30 days, 32 participants responded to the questionnaire, and the average number of correct answers was 90.97%, ranging from 71.9% to 100% for the negative images, and 84.4% to 96.9% for the positive images. Sixty days after the training, there were 22 participants present. The average accuracy rate was 92.92%, ranging from 72.7% to 100%

for negative images, and from 81.82% to 100% for positive images. These results are illustrated in the following image.

**Graphic – Average of correct answers before and after teoretical-practical training**



Prepared by the authors (2024).

## Conclusion

The short-term theoretical-practical training in eFAST for undergraduate students demonstrated effectiveness in identifying pneumothorax. Due to its applicability in medical practice and long-term usefulness, the implementation of time-effective training should be considered as a teaching tool to be structured during medical graduation.

**Keywords:** Medical Education, Emergency Medicine, Trauma-Focused Sonographic Assessment, Ultrasound, Teaching, e-FAST.



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