

# Effectiveness of a 1-Hour Extended Focused Assessment With Sonography in Trauma Session in the Medical Student Surgery Clerkship <sup>☆, ☆ ☆</sup>

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**OBJECTIVE:** To demonstrate the effectiveness of incorporating 1 hour of ultrasound training on the extended focused assessment with sonography in trauma (eFAST) into the year-3 medical student surgical clerkship.

**DESIGN:** A prospective cohort study where participants served as self-controls. One hour of instruction in the eFAST examination, along with 3 required observed examinations, was incorporated into the year-3 surgery clerkship. Effectiveness of the training was evaluated by a preliminary and posttraining assessment. An online survey was used assessing comfort based on a 5-point Likert scale. An online quiz was used assessing knowledge, and a 2-part objective structured clinical examination (OSCE) was used assessing skill and speed. Participants also logged 3 eFAST examinations during the 10-week clerkship where they reported their comfort in performing and interpreting the eFAST on a 5-point Likert scale. Postassessment was held during the last week of the clerkship and included the same online quiz, survey, and 2-part OSCE.

**SETTING:** The study was performed at Loma Linda University and affiliated hospitals where surgical clerkship students rotate.

**PARTICIPANTS:** A total of 148 year-3 medical students completed the study.

**RESULTS:** All testing modalities showed improvement. The mean average of the OSCE improved from  $46\% \pm 27\%$  to

$81\% \pm 18\%$ . The percentage of participants able to perform the examination in less than 6 minutes increased from  $18\% \pm 27\%$  to  $84\% \pm 36\%$ . Participants' comfort level in recognizing eFAST pathology increased from a mean of  $2.40 \pm 0.94$  to  $3.55 \pm 0.87$  out of 5. Comfort in performing the eFAST examination improved from  $2.81 \pm 0.79$  to  $3.77 \pm 0.68$ . Comfort in interpreting the eFAST examination improved from  $2.88 \pm 0.87$  to  $3.65 \pm 0.72$ .

**CONCLUSIONS:** This study demonstrates that incorporating 1 hour of eFAST training into the general surgery clerkship is feasible and may lead to improved competency in performing and interpreting the eFAST examination. (J Surg Ed ■■■■-■■■. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** ultrasound, medical student, medical education, surgery

**COMPETENCY:** Medical Knowledge and Patient Care

## INTRODUCTION

Fifty years ago, the stethoscope was the main diagnostic tool for the physician. The portable ultrasound machine has shown itself to be the next innovative step in bedside diagnostic tools and as the American Institute of Ultrasound in Medicine states, the idea of an ultrasound stethoscope is not far off.<sup>1</sup> Recently, the use of portable ultrasound machines relaying important visual and sonographic information has become a valuable tool for clinicians. Ultrasound is a reliable and innovative way that illustrates the evolution of our diagnostic power from the stethoscope. The field of point-of-care ultrasound (POCUS), which is

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**TABLE 1.** How the Study Was Incorporated into Each 10-Week Surgery Clerkship Track. Preliminary Assessment Took Place During Week 1 With Training Given After Their Assessments. Participants Performed Examinations on Patients During Weeks 2-9 and on Week 10 a Postassessment Took Place

Week 1	Weeks 2-9	Week 10
Preliminary assessment <ul style="list-style-type: none"> <li>• Online survey</li> <li>• Online quiz</li> <li>• OSCE               <ul style="list-style-type: none"> <li>○ eFAST</li> <li>○ Simulated FAST</li> </ul> </li> </ul>	Performed 3 eFAST scans that were evaluated by ED resident or faculty	Preliminary assessment <ul style="list-style-type: none"> <li>• Online survey</li> <li>• Online quiz</li> <li>• OSCE               <ul style="list-style-type: none"> <li>○ eFAST</li> <li>○ Simulated FAST</li> </ul> </li> </ul>
Training <ul style="list-style-type: none"> <li>15 min video</li> <li>45 min bedside training</li> </ul>		

designed to answer a specific clinical question at the bedside, can immediately inform and direct patient management.<sup>2</sup> As ultrasound is becoming an integral component of medicine, medical schools are increasingly emphasizing the importance of training medical students in bedside ultrasonography.<sup>3-6</sup>

An example of applying POCUS is the focused assessment with sonography in trauma (FAST). The term FAST came about from a consensus on using ultrasound in patients with trauma and recommendations in 1997.<sup>7</sup> Since its inception, it has become a standard practice examination demonstrating high specificity for detecting free pericardial, peritoneal, and pelvic fluid. Since then, additional research has been done evaluating the use of the extended focused assessment with sonography in trauma (eFAST). The eFAST adds additional value owing to a better sensitivity for detecting a pneumothorax than a supine chest X-ray and has been recommended to be included in the initial evaluation of a trauma patient.<sup>7-12</sup> The eFAST examination incorporates the fundamentals of any bedside ultrasound examination and involves multiple basic ultrasound windows. Not only has the eFAST examination been included in the core milestone consensus for ultrasound education in the undergraduate medical education (UME), but it has also been demonstrated as an easy examination to teach and incorporate into the surgery clerkship at some medical schools.<sup>4,5,13</sup>

The support for incorporating ultrasound into the UME has been previously published.<sup>14-22</sup> However, there are questions about how to best incorporate ultrasound education into the curriculum. Although some institutions have incorporated eFAST into the UME curriculum, there is a paucity of evidence that assesses the actual effectiveness of it and in particular the effectiveness of a 1-hour training event. The purpose of our study is to demonstrate the effectiveness of incorporating eFAST into the year-3 surgical clerkship with 1 hour of training. Effectiveness was defined as improvement in comfort, knowledge, skill, and speed.

## MATERIALS AND METHODS

### Study Design

The study design was an observational cohort study where participants served as self-controls. It was deemed institutional review board exempt by our local institutional review board.

### Setting and Participants

The study period took place in the 2015 academic year during the year-3 surgery clerkship from June 2015 to June 2016. All study elements were integrated into the required surgery clerkship curriculum. All participants were part of the original class of 2017 and all had received formal ultrasound training in their first year of medical school.<sup>23</sup> A total of 148 participants were included. There were no exclusion criteria.

### Variables

Table 1 delineates the timeline of the study. At the beginning of the 10-week surgery clerkship track, participants completed a preliminary online survey and quiz. The preliminary survey assessed participants' comfort level in recognizing eFAST pathology and their perception of ultrasound training. The survey used a 5-point Likert scale with 1 being very uncomfortable and 5 being very comfortable. The survey was completed on Qualtrics, an online survey service. The online quiz was produced by the American College of Emergency Physicians, and was designed to assess a resident's knowledge of the eFAST examination.<sup>24</sup> The quiz questions are randomly generated from a large question bank.

The pretest took place during the first week of the 10-week surgery clerkship where participants completed an 18-item eFAST objective structured clinical examination (OSCE) by scanning a live model (Fig. 1). To assess ability to perform the eFAST scan, the participants had 6 minutes to perform the eFAST OSCE examination on a normal live

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