

ORIGINAL RESEARCH

**A126 DEVELOPMENT AND EVALUATION OF A LOW-COST, HIGH FIDELITY, REUSABLE, FOCUSED ASSESSMENT WITH SONOGRAPHY IN TRAUMA (FAST) SIMULATOR**

**Amy Sanders**<sup>1</sup>, Samuel Martin<sup>1</sup>, Shatha Shahin Shahin<sup>1</sup>, Frederick Stourton<sup>2</sup>, Johann Willers<sup>2</sup>, Gianluca Colucci<sup>1,2</sup>; <sup>1</sup>Brighton And Sussex Medical School, Brighton, United Kingdom, <sup>2</sup>Worthing Hospital, University Hospitals Sussex NHS Foundation Trust, Worthing, United Kingdom

**Correspondence:** A.Sanders1@uni.bsms.ac.uk  
10.54531/BZVO8427

**Introduction:** Focused assessment sonography in trauma (FAST) is an important adjunct to doctors in emergency medicine and surgical settings for patients with blunt trauma by identifying intraperitoneal and pericardial free fluid through 4 basic views [1]. The practical training in FAST currently uses either clinical patients or simulation models (phantoms) [2]. However, these phantoms are often expensive, low fidelity, and/or have fixed anatomy [2]. This project aims to manufacture and evaluate a low-cost, high-fidelity, reusable, and dynamic FAST phantom focusing on abdominal views.

**Methods:** To construct the phantom, food storage containers were placed into a plastic torso. Aqueous dietary fibre antifreeze mix (ADAMgel) was used to make the Liver and Spleen [3]. Kidneys were made using ADAMgel as a proxy medulla and gelatine for the cortex. The dynamic elements of the model were assembled using a balloon and medical tubing system, attached to a 3-way tap, syringe, and saline. The elements were placed in the respective containers in the torso.

The FAST phantom was evaluated by acute speciality doctors, who completed a pre-and post-intervention questionnaire collecting data via a 5-point Likert scale.

The questions were based on the acquisition of knowledge and skills. Additional questions in the post-intervention questionnaire tested the phantom's realism. The Likert data from the questionnaire was analysed using descriptive statistics, as shown in Table 1-A126.

**Results:** The FAST phantom was tested by 10 acute-specialty doctors. Its sonographic realism was rated highly with at least 70% of responses agree or strongly agree.

In the questions assessed pre-and post-intervention, at least one quartile increased post-intervention and 100% of the upper quartiles were Likert 5 (strongly agree), suggesting it was a valuable educational tool.

**Discussion:** The FAST phantom improved doctors' knowledge, skills and confidence regarding FAST, with good sonographic anatomical realism and dynamic images.

This was a small-scale, proof-of-concept project, requiring further development, testing and validation. The promising results suggest this low-cost, high-fidelity, reusable, and dynamic FAST phantom could allow greater access to simulated FAST training through more economically and environmentally sustainable routes.

**Ethics statement:** Authors confirm that all relevant ethical standards for research conduct and dissemination have been met. The submitting author confirms that relevant ethical approval was granted, if applicable

**REFERENCES**

1. Richards JR, McGahan JP. Focused Assessment with Sonography in Trauma (FAST) in 2017: What Radiologists Can Learn. *Radiology*. 2017;283(1):30-48.
2. Al-Zogbi L, Bock B, Schaffer S, Fleiter T, Krieger A. A 3-D-Printed Patient-Specific Ultrasound Phantom for FAST Scan. *Ultrasound Medical Biologoy*. 2021;47(3):820-832.
3. Willers J, Colucci G, Roberts A, Barnes L. 0031 Adamgel: An economical, easily prepared, versatile, selfrepairing and recyclable tissue analogue for procedural simulation training. *BMJ Simulation & Technology Enhanced Learning*. 2015;1(suppl 2):A27.

**Acknowledgments:** All funding for this project originates from Brighton and Sussex Medical School.

**Table 1-A126.** Data analysis of Likert data from participant questionnaires. Left upper quadrant (LUQ), Right upper quadrant (RUQ)

Question	Before median	IQR	% Agree/ Strongly Agree	After median	IQR	% Agree/ Strongly Agree
I understand the elements of FAST	4	2-4	60	4	4-5	80
I understand the relevant anatomy of FAST	3	2-4	50	4	3-5	70
I am comfortable carrying out a FAST exam on a patient	3.5	2-5	50	4	3-5	70
I am confident in identifying a negative FAST in RUQ	2.5	2-4	40	3.5	2-5	50
I am confident in identifying a Positive FAST in the RUQ	3	2-5	40	4	3-5	60
I am confident in identifying a negative FAST in the LUQ	2.5	2-4	40	4	4-5	50
I am confident in identifying a positive FAST in the LUQ	2.5	2-5	40	4	3-5	60
The liver reasonably resembles the real thing				4.5	4-5	80
The spleen reasonably resembles the real thing				4	4-5	80
The kidneys reasonably resemble the real thing				4	3-5	70
The positive RUQ view reasonably resembles the real thing				4	3-4	70
The positive LUQ view reasonably resembles the real thing				4	4-5	80