

# Focused Assessment with Sonography **46** for Trauma

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## 46.1 Introduction

Focused assessment with sonography for trauma (FAST) is an echographic approach used for patients with abdominal trauma. It is a limited bedside ultrasound examination that seeks to quickly detect free intra-abdominal fluid, particularly blood. Extended FAST (E-FAST) expands the examination to assess whether there is pneumothorax or cardiac complications.

FAST answers one question only: Is there free fluid in the abdomen?

So, the indications for performing FAST are *blunt or penetrating trauma, trauma in pregnancy, or hypotension of unclear cause*.

FAST helps to select the patients requiring emergent laparotomy and who can be monitored or can await slower, more definitive studies. The FAST examination has many advantages over more traditional tests such as explorative laparotomy, peritoneal lavage, and abdominal CT scan, as listed below:

- It decreases the time needed for diagnosis because it can be executed at the bedside, it is noninvasive, and it does not require a contrast medium or radiation.

- It is safe in pregnant woman and in children.
- It can be performed serially.
- It has high specificity to detect free fluid (between 98 and 100%).
- It can be used to diagnose and assess the degree of hemoperitoneum.
- It needs a short training period, so its use can be extended to every emergency doctor.

On the other hand, FAST has many drawbacks:

- It has lower sensibility to detect peritoneal fluid (between 73 and 88%).
- It requires almost 200 ml of fluid for detection.
- It cannot detect retroperitoneal fluid.
- It has limited ability to detect organ lesions.
- It is operator-dependent.
- Difficult in obese subjects.

The conclusion is that negative findings from FAST do not exclude the presence of peritoneal fluid.

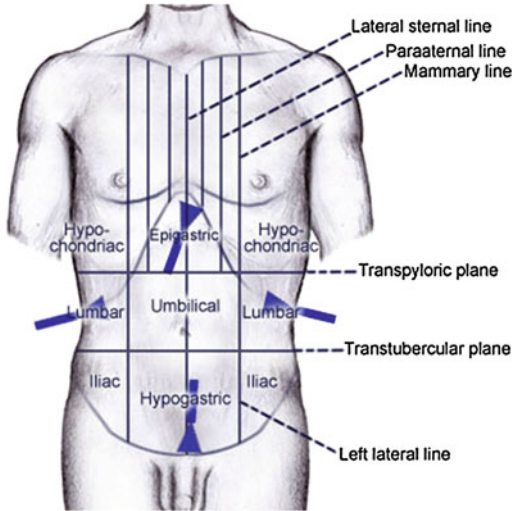
## 46.2 Indication for FAST or E-FAST and Examination Skill

1. Abdominal trauma
2. Trauma in pregnancy
3. Hypotension of unclear cause

The philosophy behind the FAST examination is that fluid pools in the lower areas of the abdomen and chest. Four views can be used for the abdomen:

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**Fig. 46.1** Views and the position of the probe

- Right lumbar (hepatorenal recess)
- Left lumbar (perisplenic)
- Suprapubic window
- Subxiphoid pericardial window to evaluate the heart

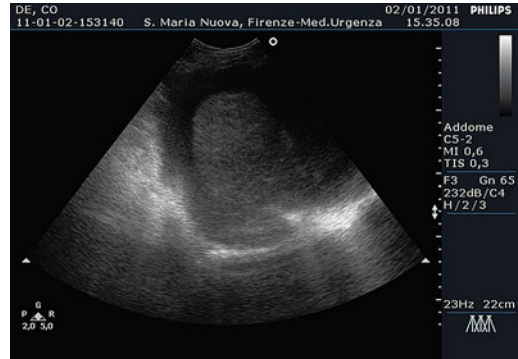
A standard 3.5-MHz convex probe can be used.

Views and the position of the probe are shown in Fig. 46.1 .

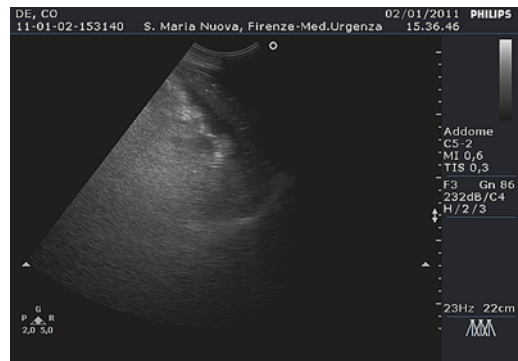
### 46.3 Right Lumbar Side

With this view the hepatorenal space is explored. This is named the Morison pouch. The probe is placed on the right upper quadrant at the mid-axillary line between the ninth and 11th ribs. Both oblique and coronal views should be used. The examiner can see the liver and during deep inspiration the kidney appears and with it the Morrison pouch, which is the space between the liver and the right kidney. In a supine patient this space is chosen for drainage of ascites, the place where initially all peritoneal liquid, if enough, accumulates. Normally, it is free from fluid and appears hyperechoic. In cases of hemoperitoneum, the Morrison pouch appears as an anechoic strip.

If there is copious fluid, over 200 ml, it may be detected in the perihepatic space (Fig. 46.2).



**Fig. 46.2** Perihepatic fluid



**Fig. 46.3** Anechoic perisplenic space

### 46.4 Upper Left Lumbar Side

The probe is placed over the left flank, on the left upper quadrant at the posterior axillary line between the ninth and 11th ribs. Sliding the probe superiorly and inferiorly will help to detect free fluid above the spleen and along the spleen tip. Ascites can be seen at the upper splenic tip, in the subphrenic place over the spleen, or in the recess between the spleen and left kidney. It appears as an echogenic space which better defines the outline of the spleen (Fig. 46.3).

### 46.5 Suprapubic View

The probe should be placed just above the pubic symphysis and directed inferiorly (Fig. 46.1). The pelvis is the most dependent part of the

peritoneal cavity, so it is fluid collects there easily. Both sagittal and transverse views should be obtained. The bladder should be left full to provide a better window. So, fluid around and behind the bladder can be stressed and in women so can the Douglas pouch.

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## 46.6 Subxiphoid View

The subxiphoid view is obtained by placing the probe in the subxiphoid space directed toward the left shoulder, at an orientation of 45°. This will allow the diaphragm and pericardium to be viewed and a four-chamber view of the heart. This view may be uncomfortable for many patients because it requires significant pressure on the upper abdomen to perform it.

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## Further Reading

ACEP Clinical Policies Committee and the Clinical Policies Subcommittee on Acute Blunt Abdominal

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