FAST defined

- **Focused Assessment with Sonography for Trauma**
- Quickly survey the abdomen, dependent regions for potential spaces of to detect blood from organ or vascular injuries.
- Detect 100 to 150ml of intraperitoneal fluid.
- CT is more accurate but may not be practical.
  - Hemodynamically unstable patients-hypotension cause
  - Intoxicated Patients
  - Observation and re-examination
  - CT not available

FAST in the past

- Goldberg et al – investigated the sensitivity of ultrasound to detect free intraperitoneal fluid in 1970
- Kristensen et al – performed first U/S to assess an injured patient in 1971
- Asher et al – U/S had 80% sensitivity in screening for splenic injury in 1976
- Tiling et al reported sensitivity 89%, specificity 100% & accuracy 98% in 1990
FAST in the present

- Jang 2004 – “Residents should not independently perform FAST after 10 training exams”
- <20 exams: Sensitivity 51-89%/Specificity 92-99%
- >31 exams: Sensitivity 89-98%/Specificity 94-99%
- No patient required laparotomy was missed by an operator with > 31 exams (J US Med 2004;23:793-797)
- eFAST - Extended Focused Assessment with Sonography for Trauma
  - Hemothorax, Pneumothorax (occult)
  - Includes additional views of the lung

- The MORE exams the better!

Four probe positions

3.5 MHz probe

- Abdominal or cardiac
- Supine position

1. A4 Right- mid to posterior axillary line
   - Liver and Right Kidney
2. A4 Left- Posterior flank
   - Spleen, Left Kidney
3. A1 Subxiphoid
   - Cardiac
4. A7
   - Bladder, Uterus/Prostate
FAST - Right Upper Quadrant (RUQ) View 1

- Patient position
  - Supine
  - Trendelenberg position may give a better view of the RUQ structures

- Transducer Placement
  - A4/ About mid axillary line, 7th - 11th intercostal space
  - Indicator marker toward the head

FAST - RUQ

- The RUQ is the most common location for identification of intra-abdominal fluid or blood in the supine position.

- Hemoperitoneum - hypoechoic fluid between the liver and kidney, subdiaphragmatic space or near the inferior pole of the kidney in the paracolic gutter.

FAST - RUQ

- The width of the stripe in Morrison’s pouch (cm) roughly equals the amount of fluid in the abdomen
FAST tip for RUQ

• Trendelenberg position may facilitate visualization of fluid in upper abdomen.
• Lung, Liver Kidney
• Multiple windows and repeat exams maybe necessary to confirm presence of free fluid.
• Counter clock rotation help eliminate the rib shadows.
• Most of the time the transducer has to be moved more superiorly and posteriorly.

FAST - Left Upper Quadrant (LUQ)

• Transducer Placement
  • A4/ About the mid – posterior axillary line, 7th–11th intercostal space
  • Indicator marker toward the head

FAST - LUQ

• Fluid most often collects between the diaphragm and the spleen in the left upper quadrant.
• Hemoperitoneum – hypoechoic fluid between the spleen and kidney, sub-diaphragmatic or near the inferior pole of the kidney in the paracolic gutter.
FAST tip for view LUQ

- Clockwise rotation can eliminate the rib shadows
- Slide toward the back (into the bed)
- Lower probe position than view 1.
- Sliding upward will expose the left diaphragm and pleural space.

FAST tip for LUQ

- Fluid in Stomach versus a Hemoperitoneum
- Both are anechoic!
- Fluid in stomach does not layer out between kidney and spleen

FAST/Pericardial Subxiphoid view 3

- Transducer Placement
  - Subxiphoid, pointing towards the left shoulder
  - Indicator marker towards the patient’s right
FAST
Pericardial Effusion
• Detection of echo-free rim around the heart within the hyperechoic parietal pericardium
• Minimal fluid accumulations that occur rapidly can be hemodynamically significant while chronic accumulations can be large without causing hemodynamic compromise

FAST/ Tamponade
• Right atrium and right ventricle collapse
• Insert movie 72

FAST tip for view 3
• Pericardial anechoic stripes that are circumferential usually represent fluid while an anterior stripe may be pericardial fat.
• Multiple windows and repeat exams maybe necessary to confirm presence of free fluid.
• Use the liver to enhance the cardiac image.
• Hand on TOP of the probe allows you to tilt the probe under the ribs.
• Hand on top of the probe also sets you up for the next view...
FAST – Suprapubic view

- Transducer Placement
  - Above pubis angled inferiorly.
  - Hand on top of probe.
  - Obtain both the transverse and longitudinal views.
    - Longitudinal View: Indicator marker toward the head and fan up and down.
    - Transverse view: Indicator marker pointing towards the patient’s right and fan right to left.

FAST/Suprapubic

- Structures to be identified
  - Bladder
  - Uterus
  - Prostate
  - Cul De Sac
  - Retrovesical space

- Sonographic Findings
  - Better to perform the US on a full bladder
  - Accumulated fluid will be found as a hypoechogenic strip in the cul de sac or retrovesical space on either side of the bladder
  - Reverse Trendelenberg may help visualize the pelvic regions.

Short and long bladder Male

- Long and short axis views required
Long axis bladder female

**Fast tips**

- Dimming room lights may aid visualization.
- Trendelenberg position may facilitate visualization of fluid in upper abdomen.
- Reverse Trendelenberg may facilitate visualization in the pelvis.
- Pericardial anechoic stripes that are circumferential usually represent fluid while an anterior stripe may be pericardial fat.
- Multiple windows and repeat exams may be necessary to confirm presence of free fluid.
- Always best to confirm with clinical/physical exam.
FAST points to ponder

• FAST should be coupled with the patient assessment and other diagnostic modalities to reach a final decision.
• Always best to confirm with clinical/physical exam.
• Bedside ultrasound cannot determine the etiology of the fluid solely on the ultrasound findings.
• False positive results may be seen in the setting of ascites or non-traumatic causes of bleeding.

Thank you

• If time permits... three slides on e-FAST

E-FAST
Lung & Pleural interface

• To detect the presence of pneumothorax or pleural effusion

  • Transducer Type & Placement
    • Phased array, linear or Curvilinear
    • L1 2nd-4th intercostal spaces, anterior chest wall
    • L2 5th-8th intercostal spaces, anterior chest wall
    • L3 4th-10th intercostal space, between the anterior & posterior axillary lines

  • Transducer Placement
    • Transducer marker pointing cephalad
    • The exam should be performed bilaterally
    • Depth about 15-20 cm
E-FAST

- Lung Sliding
  - Two echogenic pleural lines sliding with respiration and heart motion. Tend to be slightly hyperechoic.
  - Best in L1 & L2
  - Color Flow (CF) can help identify lung sliding. Color will be present at the pleural interface with respiration
  - The presence of lung sliding rules out pneumothorax