

## Delayed secondary FAST US

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Your patient had blunt abdominal trauma, has a negative FAST exam, stable vital signs, and no peritoneal signs. Your trauma team wants to pan-CT the patient, but do you really need to? Do you have another option? Here are 2 studies that looked at doing a secondary FAST at various times post injury with good evidence that it can help guide management. Notably, all patients with large hemoperitoneum on primary FAST went straight to the OR and thus are excluded from the data. This is important as dispos for high-risk patients are usually pretty easy, but the intermediate risk group poses more problems for EM physicians.

Blackbourne, et al. "Secondary ultrasound examination increases the sensitivity of the FAST exam in blunt trauma." J Trauma 2004; 57: 934-938

- Performed by on call trauma teams who had done the ACS introductory course on FAST (surgery or EM resident, trauma surgery fellow, trauma surgery attending)
- Standard 4 views on 547 patients regardless of vital signs with secondary US done 30 min-24 hours after initial depending on the convenience for the team
- Positive FAST compared to CT or OR findings
- Neg-Neg group **44.1% still got CT and 2 patients then had ex-lap** due to unstable vital signs or peritonitis – found hollow viscus injury which did not reveal significant hemoperitoneum
- Neg-Pos group: **2 ex-laps were nontherapeutic, 8 therapeutic**
- Pos-Pos group: 4/19 had ex-lap and all ex-laps were therapeutic
- Pos-Neg group: 1 (paper doesn't explain this patient at all)
- Nontherapeutic laparotomies meant no surgical intervention was made for example for findings of nonbleeding liver and spleen injuries, small bowel contusions, stable mesenteric hematomas
- Sensitivity increased from 31.1% to 72.1%
- NPV 92.0% to 96.6%
- Patients with a **negative secondary US within 4 hours didn't develop clinically significant hemoperitoneum**

Kanafi, et al. "Diagnostic accuracy of secondary ultrasound exam in blunt abdominal trauma." Iran J Radiol. 2014 Aug; 11(3): e21010

- Performed by radiology residents who had done >400 FAST exams
- Looked at 4 standard locations + interloop space only on 311 stable trauma patients
  - Examining space between small bowel loops with a linear probe, will appear as a hypoechoic triangle between bowel loops
- Primary exam done within 30 min. Secondary exam done within 12 hours
- Excluded small amounts of free pelvic fluid in women of childbearing age unless abnormal clinical signs or fluid in other areas
- Compared positive FAST to CT or OR findings (this dispo depending on surgeon preference or clinical indications)

- Neg-Neg group: 62/271 had follow up CT/OR due to persistent pain or clinical condition and **3 were found to have free fluid**
- Neg-Pos group: 9 patients, 5 of which were only interloop positive
- Pos-Pos group: 2/15 had neg CT/OR findings
- No one who had a positive first US had a negative secondary US
- Sensitivity increased from 70.7% to 92.7% from primary to secondary FAST
- Including the interloop space as a region scanned increased the sensitivity from 36.6% to 70.7% of the primary scan and 65.9% to 92.7% of the secondary scan
- The authors note that due to their inclusion and exclusion criterion, the statistical numerical values cannot be extrapolated into other situations, however, you can still see the trend in improvement of detecting free peritoneal fluid when utilizing delayed secondary US and adding the interloop space