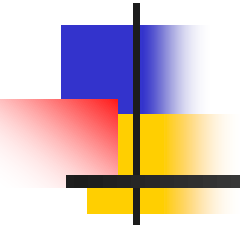


Abdominal Trauma





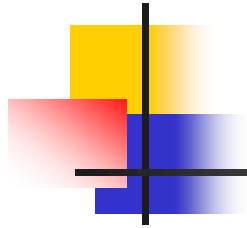
Immediate management

- Includes the initiation of resuscitation and a rapid assessment for sources of bleeding.
- Patients in shock require the administration of crystalloid solutions and blood products to support cardiovascular function as bleeding is controlled.
- Rapid survey for bleeding including assessment of the abdomen is completed to prompt transfer to the operating room when needed. Retained foreign bodies traversing the abdominal wall should be maintained throughout the initial evaluation and protected from excessive movement.
- These should then be removed only after defining a definitive plan, which almost always includes abdominal operation to manage associated injuries.

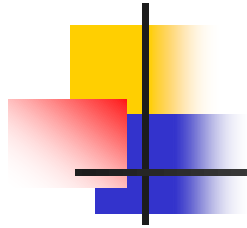


Overview

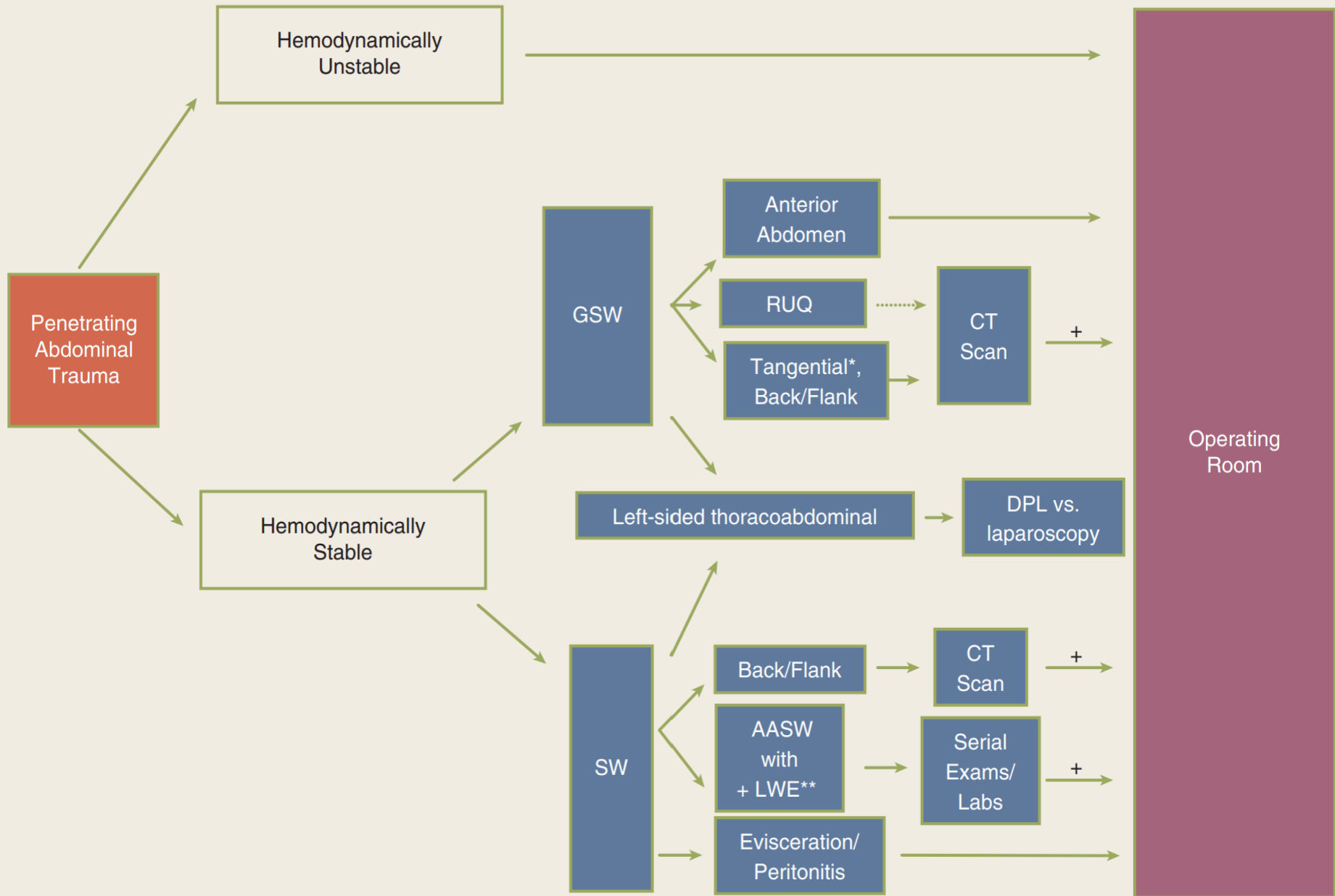
- The abdomen is a commonly injured body region and frequently requires the care of a surgeon for definitive management.
- The abdomen is a diagnostic black box.
- Fortunately, with few exceptions, it is not necessary to determine in the ED which intra-abdominal organs are injured, only whether an exploratory laparotomy is necessary.
- However, physical examination of the abdomen can be unreliable in making this determination, and drugs, alcohol, and head and spinal cord injuries can complicate the clinical evaluation.
- The presence of abdominal rigidity and hemodynamic compromise is an undisputed indication for prompt surgical exploration.



- For the remainder of patients, a variety of diagnostic adjuncts are used to identify abdominal injury.
- The diagnostic approach differs for penetrating trauma and blunt abdominal trauma.
- As a rule, laparotomy is warranted for gunshot or shotgun wounds that penetrate the peritoneal cavity because most have significant internal injuries.
- The standard has been that anterior truncal gunshot wounds between the fourth intercostal space and the pubic symphysis whose trajectory as determined by radiograph or wound location indicates peritoneal penetration should undergo laparotomy.

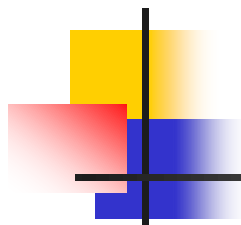


- In obese patients, if the gunshot wound is thought to be tangential through the subcutaneous tissues, CT scan can delineate the track and exclude peritoneal violation.
- Laparoscopy is another option to assess peritoneal penetration for tangential wounds it should not be done in unstable patients.
- In the scenario of tangential high energy GSWs, however, it is possible to sustain a transmitted intraperitoneal hollow visceral injury due to a blast insult.
- Gunshot wounds to the back or flank are more difficult to evaluate because of the retroperitoneal location of the injured abdominal organs. Triple-contrast CT scan can delineate the trajectory of the bullet and identify peritoneal violation or retroperitoneal entry, and associated injuries.

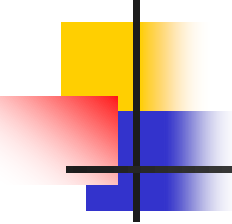


*Tangential GSWs may also be evaluated with diagnostic laparoscopy.

** A positive local wound exploration is defined as violation of the posterior fascia.

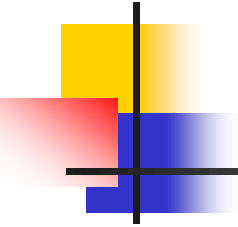


- ❑ In contrast to gunshot wounds, stab wounds that penetrate the peritoneal cavity are less likely to injure intra-abdominal organs.
- ❑ Anterior abdominal stab wounds (from costal margin to inguinal ligament and bilateral midaxillary lines) should be explored under local anesthesia in the ED to determine if the fascia has been violated.
- ❑ Injuries that do not penetrate the peritoneal cavity do not require further evaluation, and the patient may be discharged from the ED.
- ❑ Patients with fascial penetration must be further evaluated for intra-abdominal injury because there is up to a 50% chance of requiring laparotomy.
- ❑ Those with stab wounds to the flank and back should undergo contrasted CT to assess for the potential risk of retroperitoneal injuries of the colon, duodenum, and urinary tract.

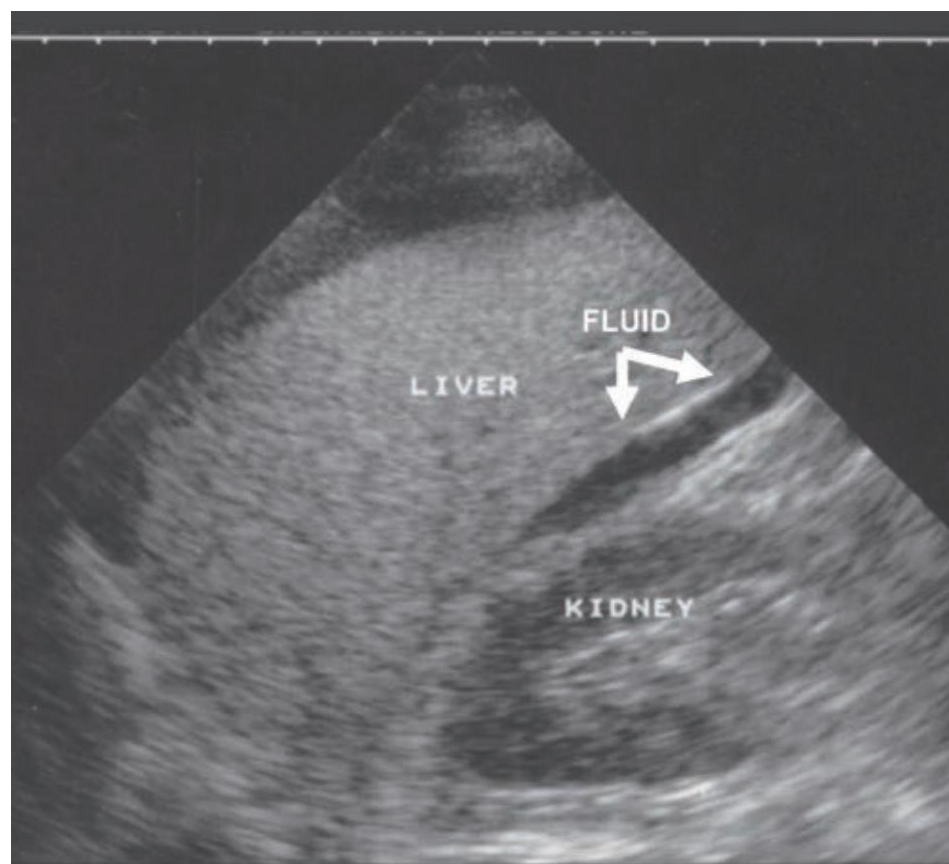
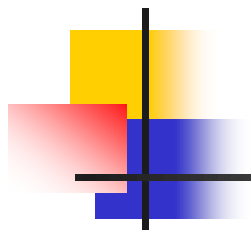


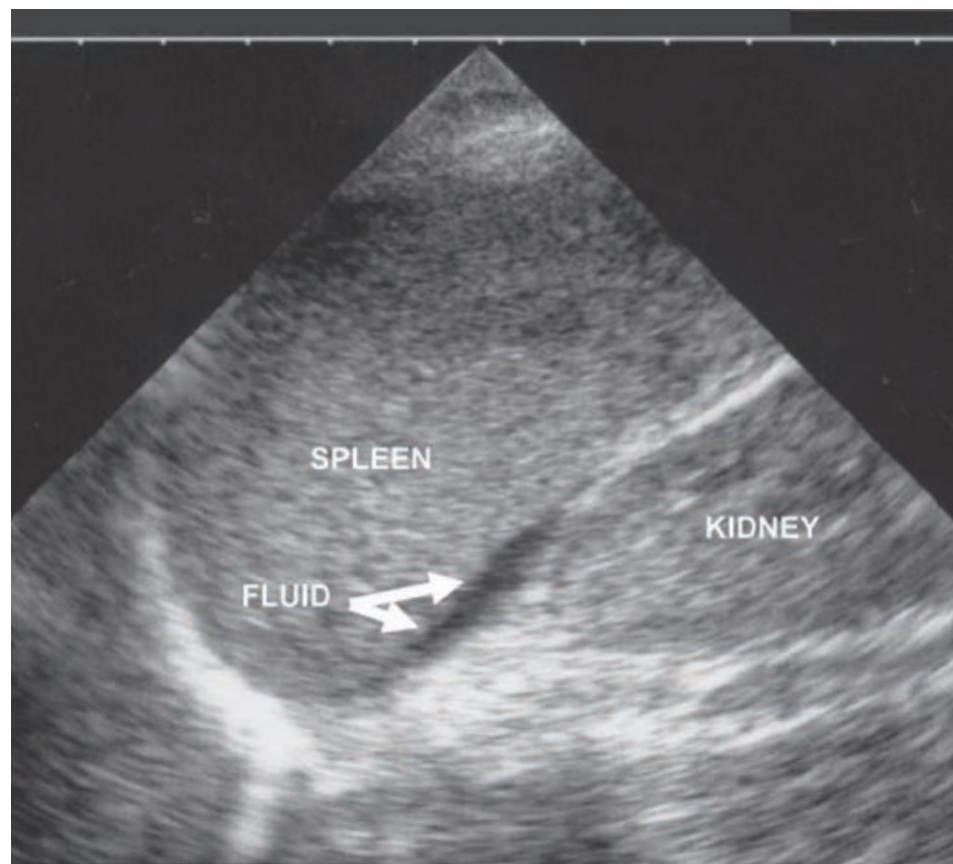
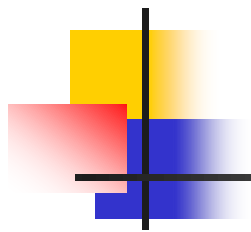
Criteria for “positive” finding on diagnostic peritoneal lavage

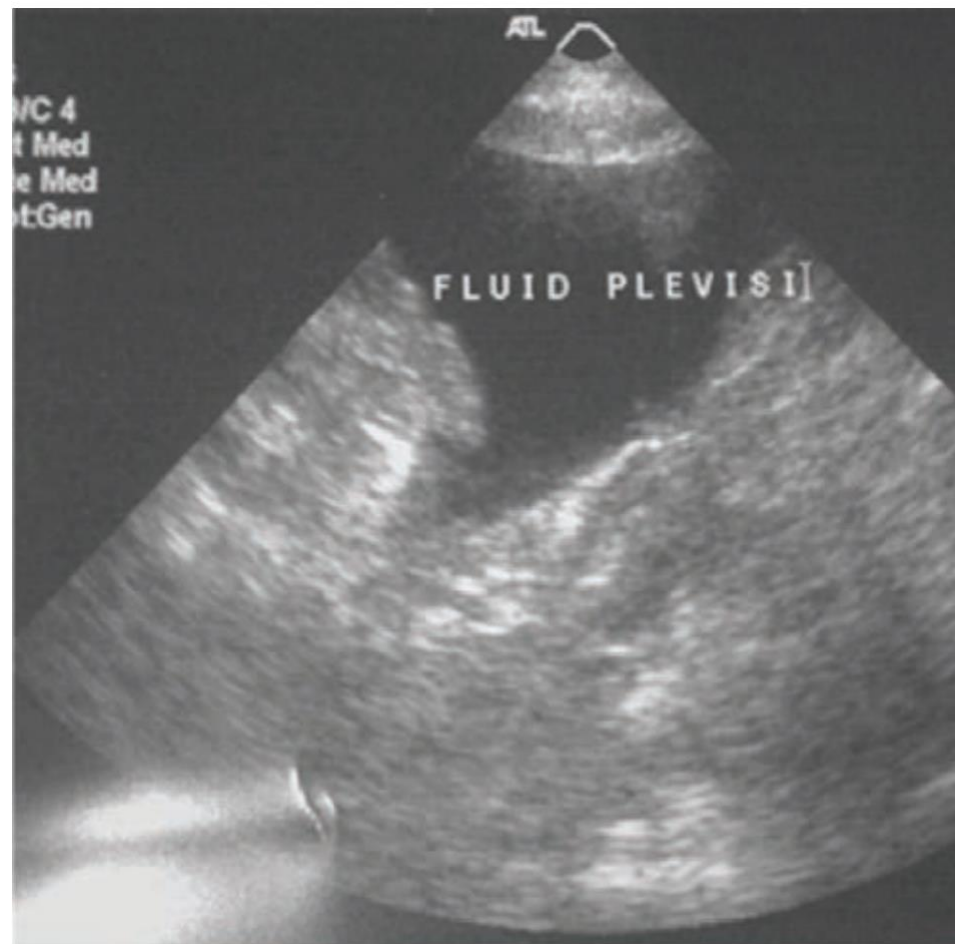
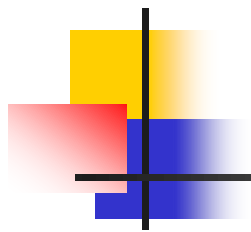
	ABDOMINAL TRAUMA	THORACOABDOMINAL STAB WOUNDS
Red blood cell count	>100,000/mL	>10,000/mL
White blood cell count	>500/mL	>500/mL
Amylase level	>19 IU/L	>19 IU/L
Alkaline phosphatase level	>2 IU/L	>2 IU/L
Bilirubin level	>0.01 mg/dL	>0.01 mg/dL

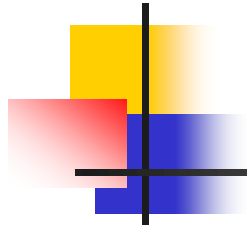


- Blunt abdominal trauma is now evaluated initially by FAST(Focused abdominal sonography for trauma) examination, and this has supplanted DPL.
- FAST is not 100% sensitive, however, so diagnostic peritoneal aspiration is warranted in hemodynamically unstable patients without a defined source of blood loss to rule out abdominal hemorrhage.
- FAST is used to identify free intraperitoneal fluid in Morrison's pouch, the left upper quadrant, and the pelvis.



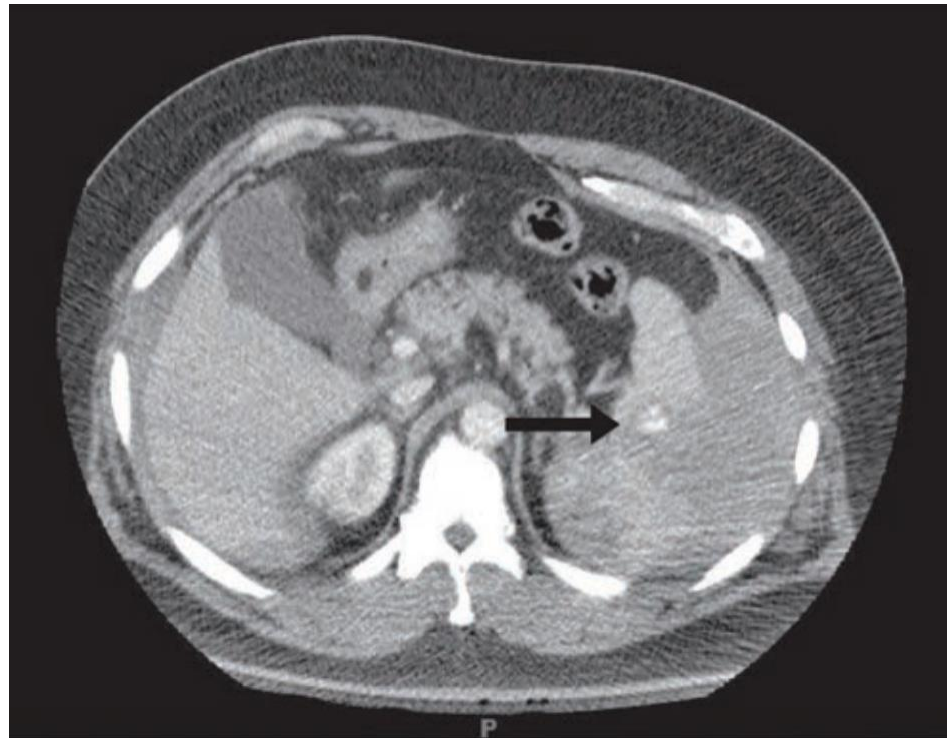




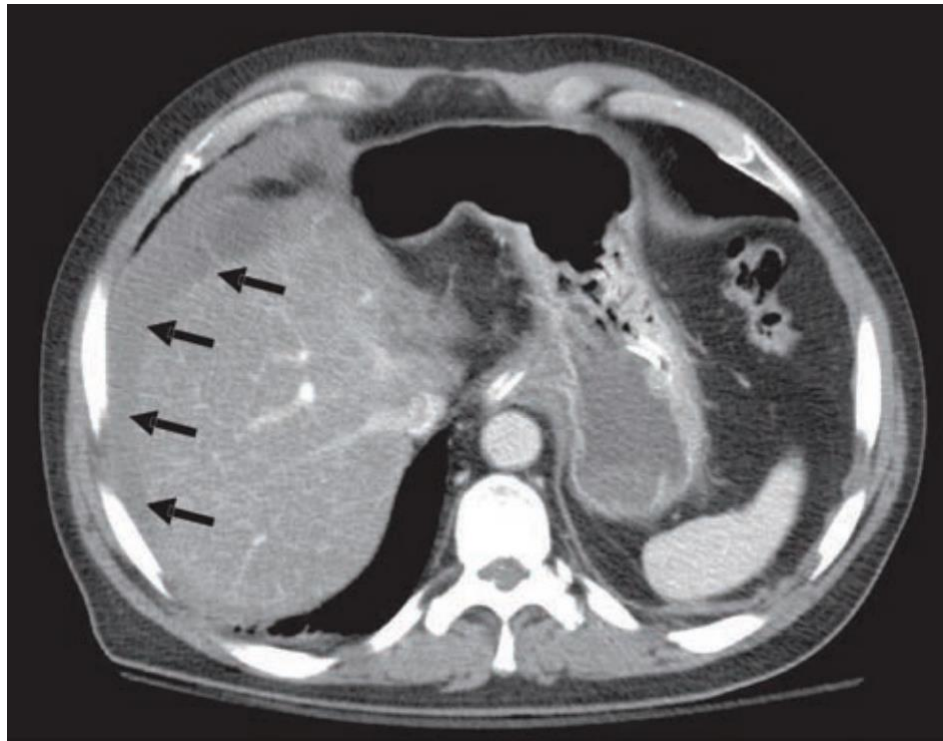


- Although this method is sensitive for detecting intraperitoneal fluid of >250 mL, it does not reliably determine the source of hemorrhage nor grade solid organ injuries.
- Patients with fluid on FAST examination, considered a “positive FAST,” who do not have immediate indications for laparotomy (hemodynamically stable, no evidence of peritonitis) undergo CT scanning to quantify their injuries.
- Additional findings that should be noted on CT scan in patients with solid organ injury include contrast extravasation (i.e., a “blush”), the amount of intra-abdominal hemorrhage, and. presence of pseudoaneurysms

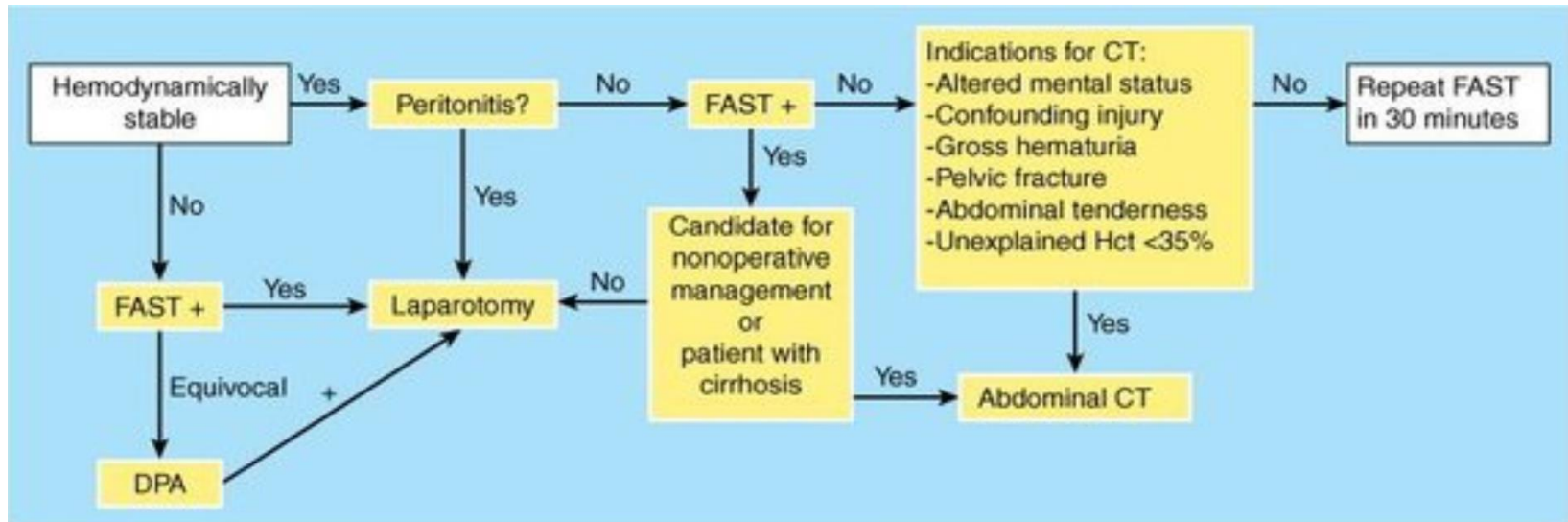
Contrast extravasation from a grade IV laceration of the spleen

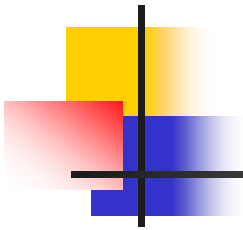


Subcapsular hematoma in a grade III liver laceration

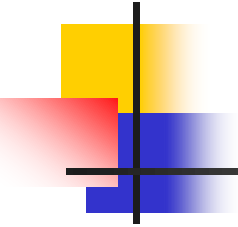


Algorithm for the initial evaluation of a patient with suspected blunt abdominal trauma





- Despite the increasing diagnostic accuracy of multidetector CT scanners, identification of intestinal injuries remains a limitation.
- Bowel injury is suggested by findings of thickened bowel wall, “streaking” in the mesentery, free fluid without associated solid organ injury, or free intraperitoneal air.
- Patients with free intra-abdominal fluid without solid organ injury are closely monitored for evolving signs of peritonitis.
- When mental status or concomitant injuries compromise the abdominal examination, diagnostic peritoneal lavage may provide valuable information.



- After placement of the catheter, a 10-mL syringe is connected and the abdominal contents aspirated (termed a diagnostic peritoneal aspiration). The aspirate is considered positive if >10 mL of blood is aspirated.
- If <10 mL is withdrawn, a liter of normal saline is instilled.
- The effluent is withdrawn via siphoning and sent to the laboratory for RBC count, white blood cell (WBC) count, and determination of amylase, bilirubin, and alkaline phosphatase levels.
- Diagnostic peritoneal lavage findings that are highly suggestive of bowel injury include the presence of more than 500 white blood cells/mm³, amylase, bilirubin, or particulate matter in the lavage fluid.