

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# laparoscopy in TRAUMA

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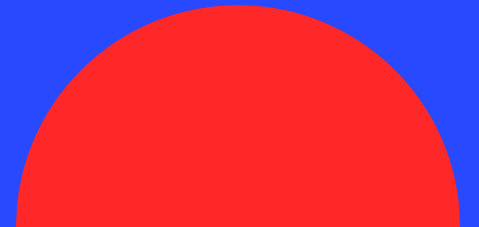
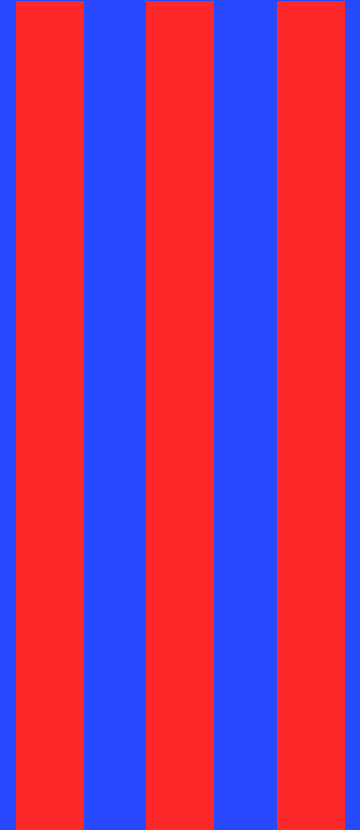
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# The indications for emergency laparoscopy can be grouped into

- Those related to abdominal pain of uncertain etiology
- Those related to trauma resulting in intra-abdominal injury



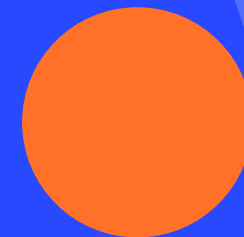
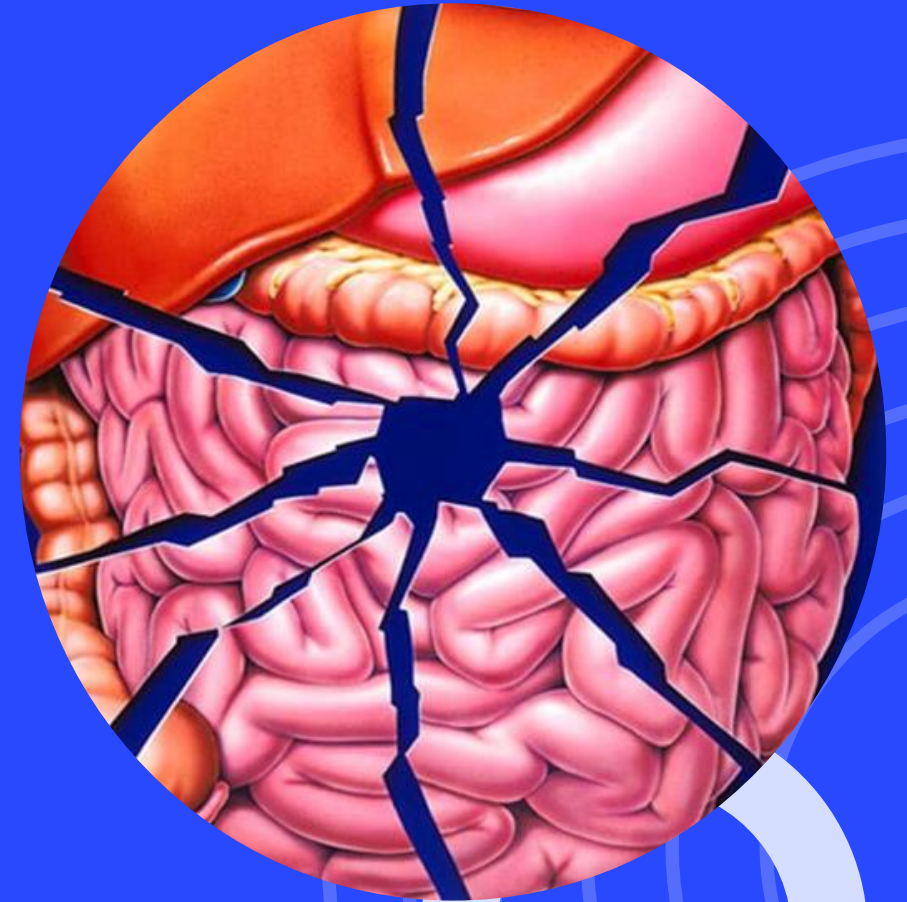
**Trauma is the fourth leading cause of death**

**One of the preventable causes of death in polytrauma patients**

**Laparotomy has traditionally been considered as the standard treatment**

**However, since laparotomy is associated with morbidity ranging from 20 to 40%**

**It may be preferable to avoid unnecessary laparotomies**



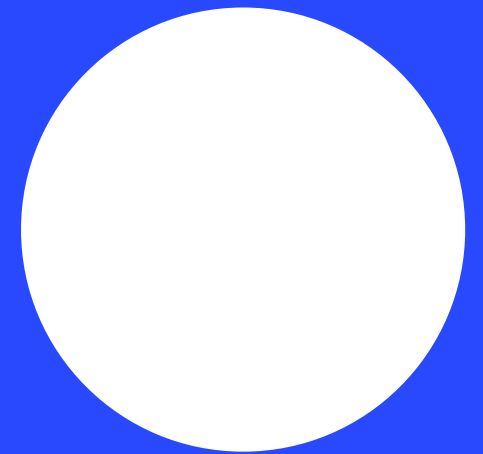
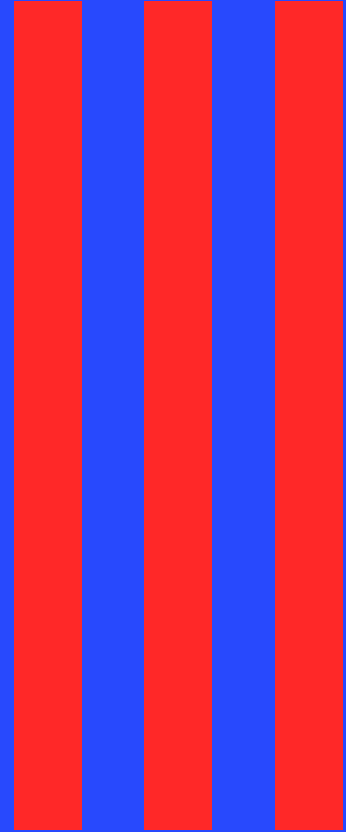
**Over the last decades,  
laparoscopy has been  
increasingly used as an  
additional tool for patients  
who are neither good  
candidates for NOM nor  
need an urgent laparotomy**



# Laparoscopy for Trauma

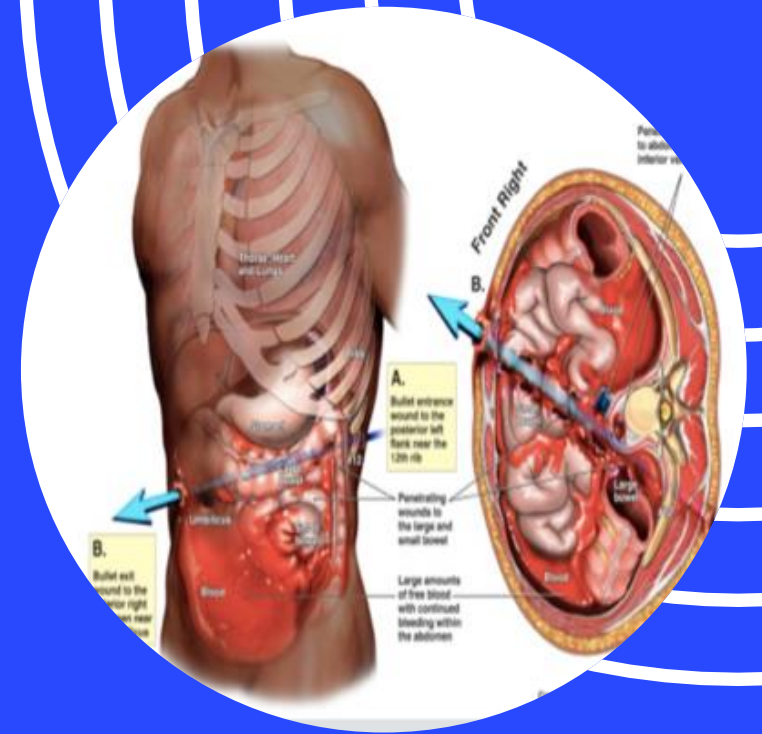
Expertise of the surgeon  
available instrumentation  
diagnostic algorithm

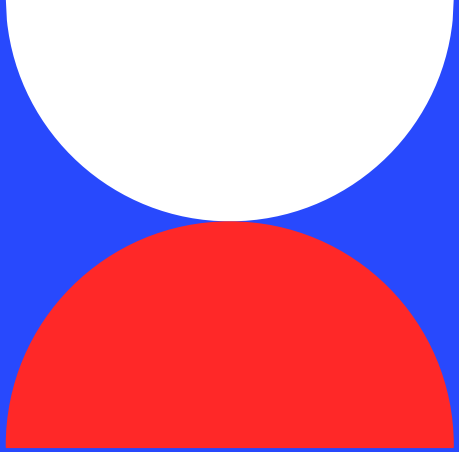
Advanced trauma life support (airway,  
breathing, and circulation) must be adhered to



# Abdominal trauma

The diagnostic approach differs for penetrating trauma and blunt abdominal trauma





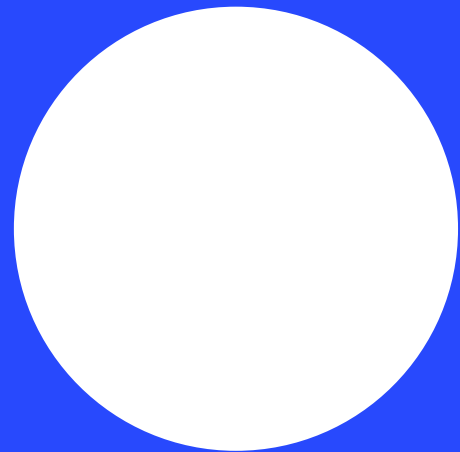
## **Should have open exploration:**

Hypotension

increasing abdominal girth

other signs of hemorrhage

# A. Blunt abdominal trauma



There are few indications for emergency diagnostic laparoscopy:

FAST

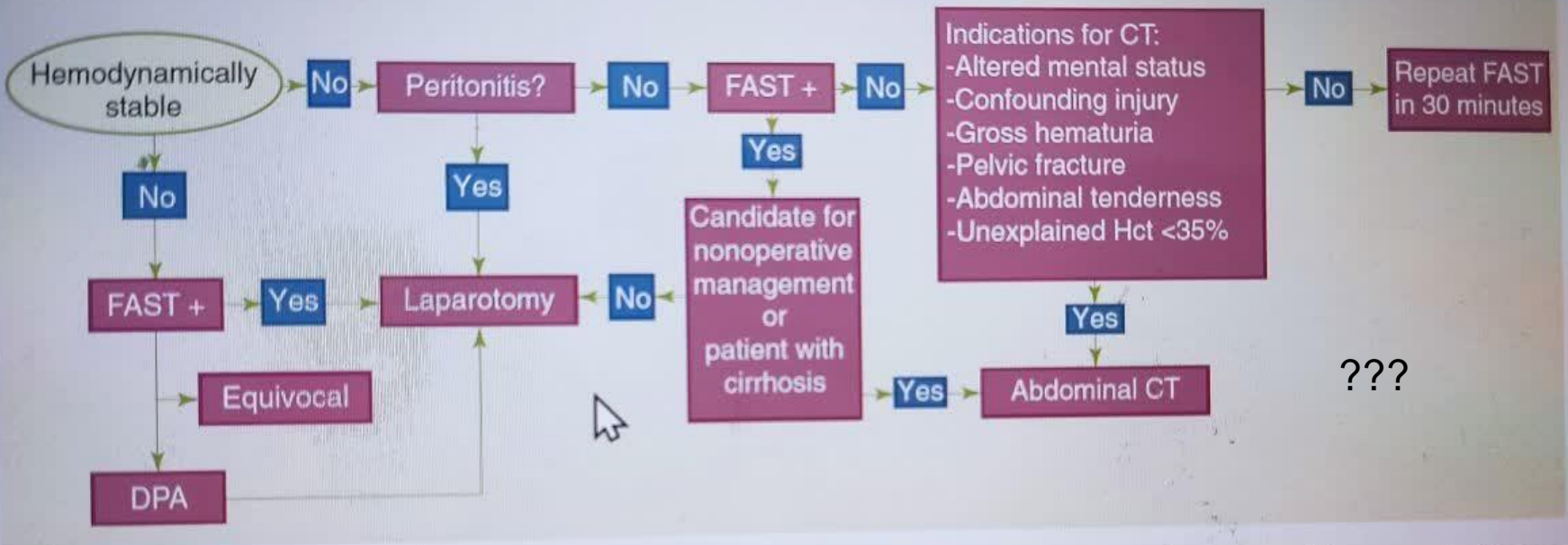
CT scan

Laparoscopy in head injured

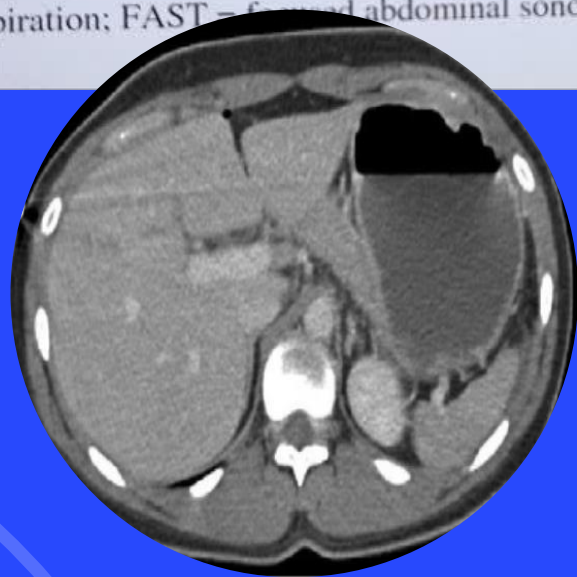
!?

1. “ seat belt sign ”
2. Free abdominal fluid without solid organ injury





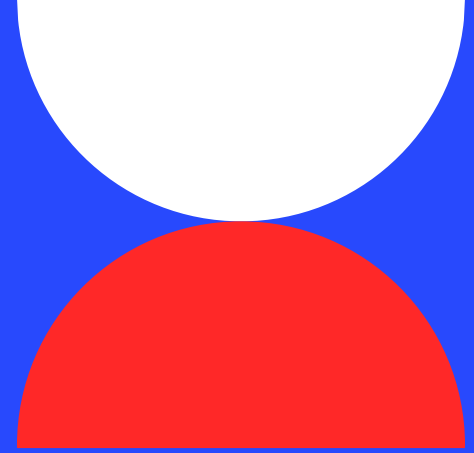
**Figure 7-26.** Algorithm for the initial evaluation of a patient with suspected blunt abdominal trauma. CT = computed tomography; DPA = diagnostic peritoneal aspiration; FAST = focused abdominal sonography for trauma; Hct = hematocrit.



# Hollow Viscus Injury



# B. Penetrating abdominal trauma



## 1. gunshot wounds

laparotomy for all patients

laparoscopy for

- patients with anterior or flank tangential injuries

Not appropriate;

- posterior gunshot wounds (posterior to the midaxillary line)

## 2. Stab wounds

Major of them

Do not require therapeutic laparotomy.

Observation by

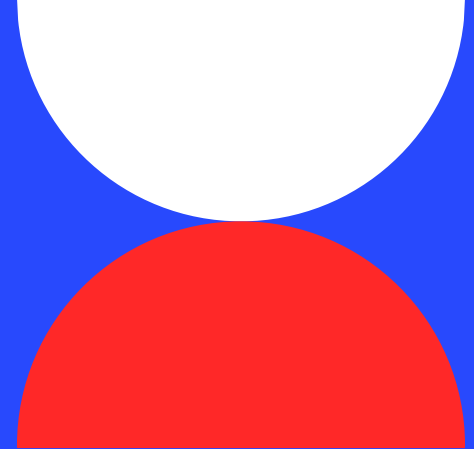
serial physical examinations,

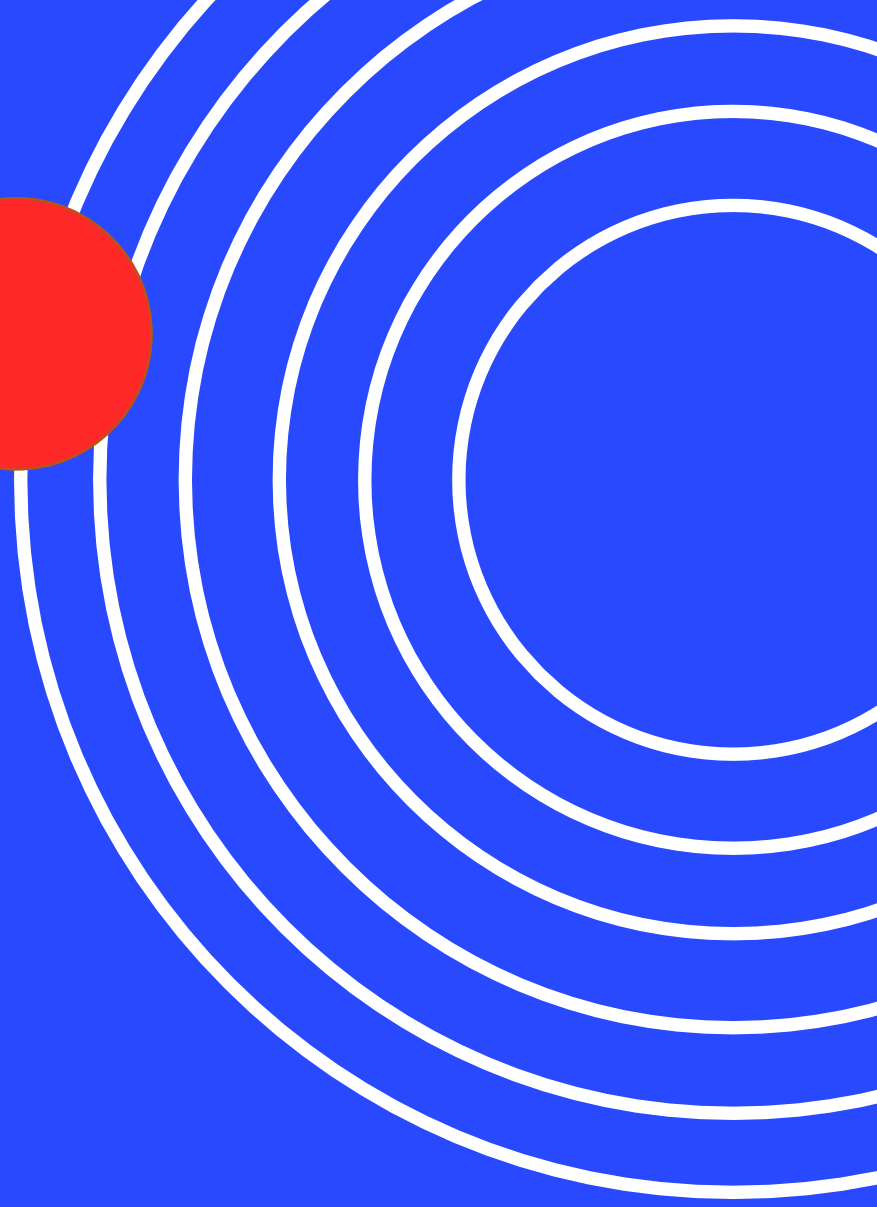
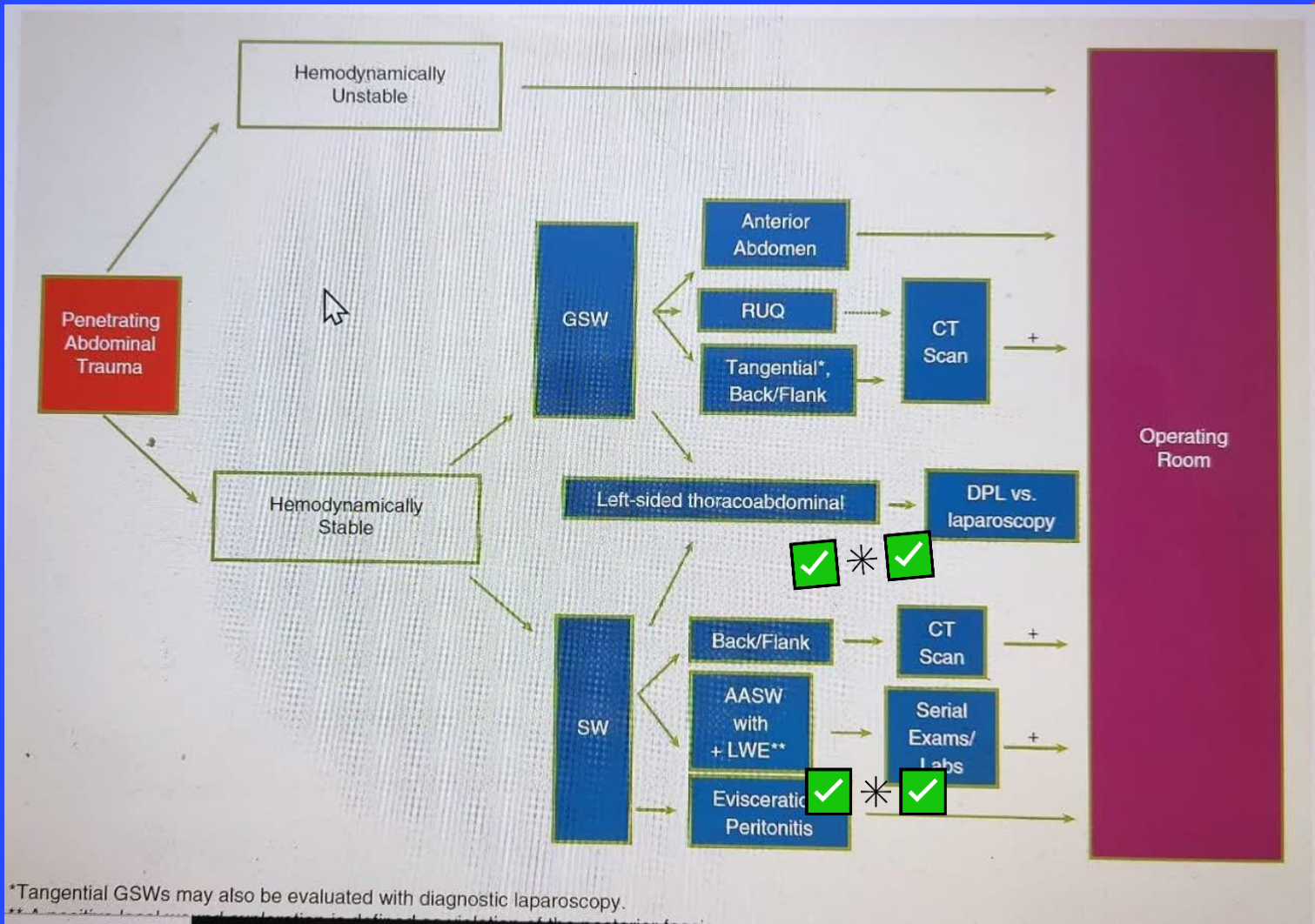
CT scan, or

us

The application of local wound exploration and diagnostic peritoneal lavage appears to be decreasing

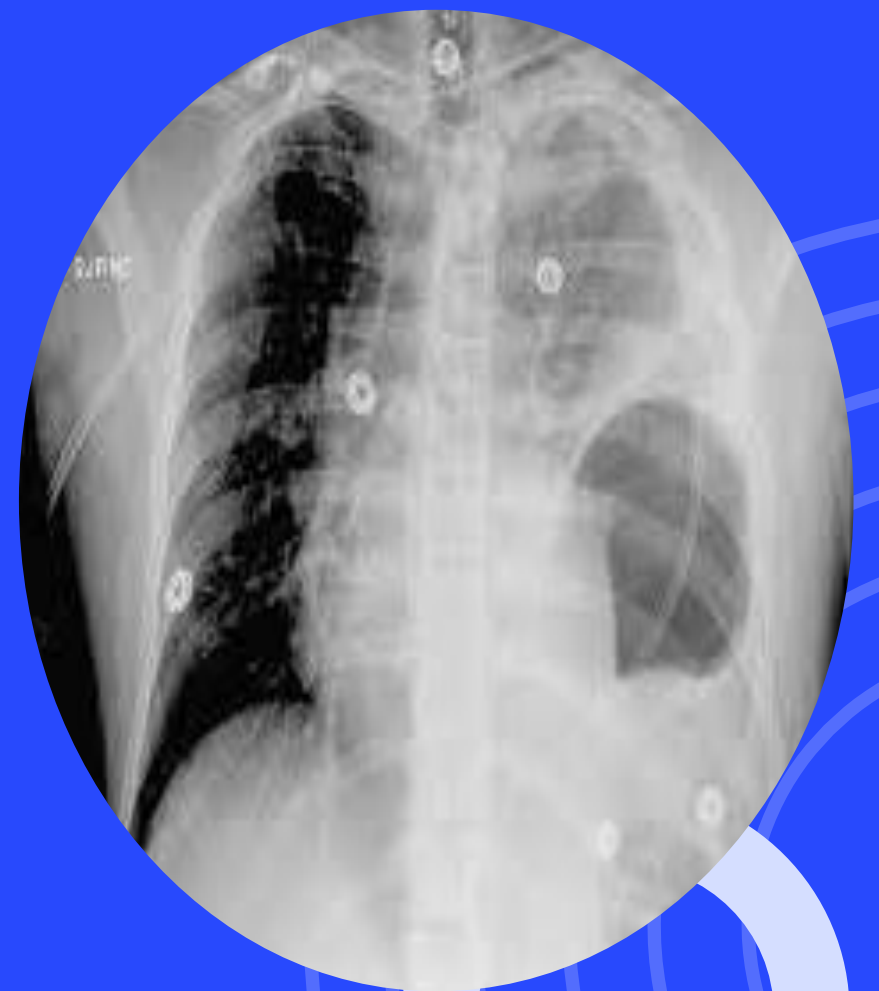
**Diagnostic laparoscopy for anterior abdominal stab:  
select patients for early discharge.**





# C. Thoracoabdominal stab wounds

Important role , especially on the left  
24% incidence of diaphragm injury,  
Isolated diaphragm injuries can be repaired laparoscopically or by open exploration



Diaphragmatic Injury



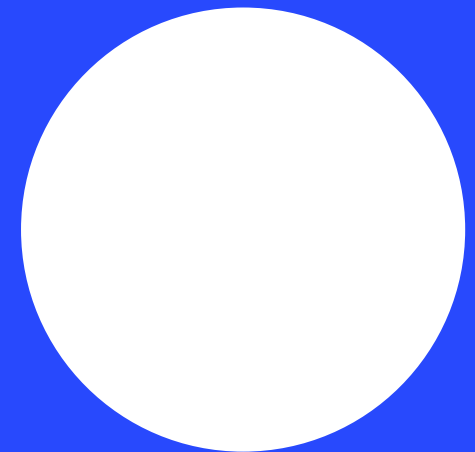
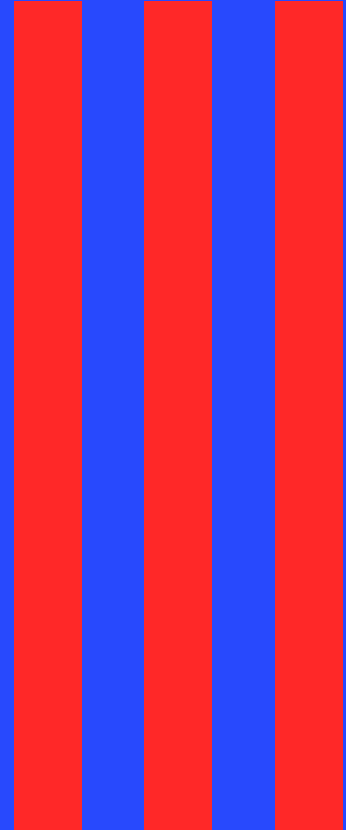
# E. Method of Laparoscopy for Trauma

Some principles to guide the exploration are as follows:

- The surgical team should be prepared to convert to open laparotomy.

Application of the modality in the diagnostic algorithm adopted requires

consideration of the technical expertise of the surgeon, the available resources in the hospital, and the relative strengths and weaknesses of other diagnostic tests available.



- CT scan

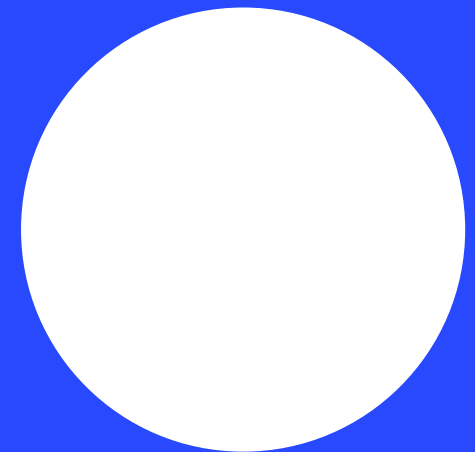
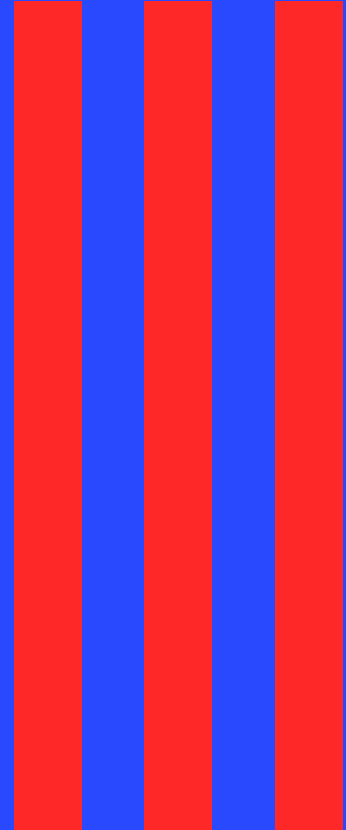
provides better information about the severity of solid organ injury because the entire organ is imaged, whereas laparoscopy allows only a surface view.

It may be difficult to adequately evaluate the entire spleen with laparoscopy owing to overlying omentum.

- Always review the chest X-ray

can be converted to a tension pneumothorax from abdominal insufflation and a diaphragm injury.

Pneumothorax may be visible laparoscopically as a bellowing out (toward the abdomen) of the ipsilateral diaphragm.





- 1. G.A.**
- 2. Supine**
- 3. Prep, from clavicles to pelvis**
- 4. Laparoscope (10 mm) :inserted through the umbilicus.**
- 5. Mobile monitors should be positioned opposite the surgeon and assistant.**
- 6. Table should allow Trendelenburg, reverse Trendelenburg, and side-to-side tilting of the table.**
- 7. Close any stab wound entrance site (simple skin closure)**



**8. If no peritoneal injury is identified, one can assume that there has not been peritoneal violation and therefore no intra-abdominal injury.**

**9. Peritoneal violation from a stab wound does not mandate open exploration . If peritoneal violation has occurred, complete exploration is necessary to exclude injury,**

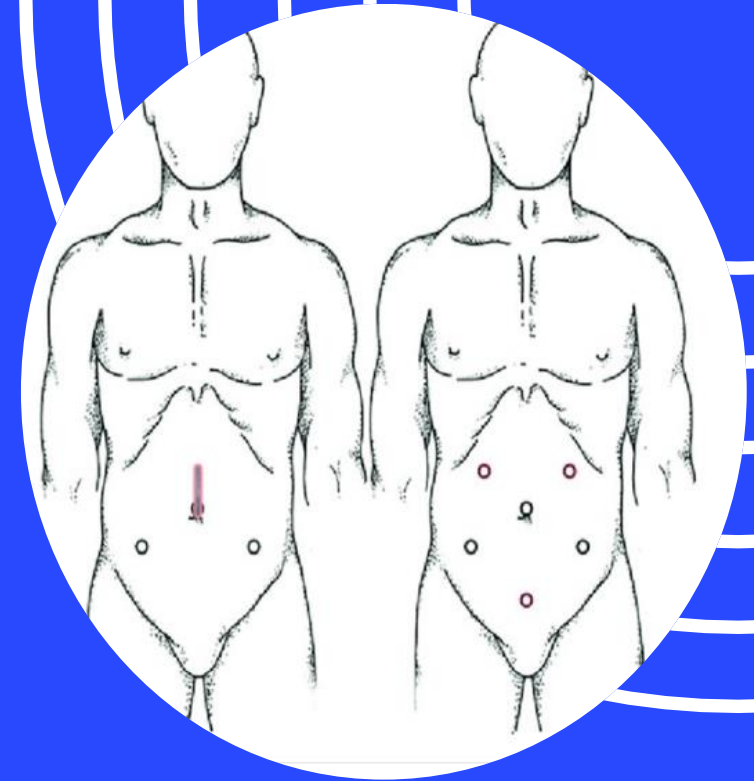
# Technique and trocar placement

In general,

- An umbilical port for a laparoscope (10 mm),
- Working port in the right iliac fossa (5 mm or 12 mm),
- Paramedial assist port, right upper quadrant (5 mm),
- Optional port (5 mm, left iliac fossa),
- Optional port (5 mm or 12 mm, left upper quadrant).

The **variation** in the patient's decubitus must be constant according to the **region of the abdomen to be explored**.

The surgeon, assistants, and the video monitor must be repositioned for better exposure and presentation of regions to be assessed.



**10. Additional trocars will be needed.**

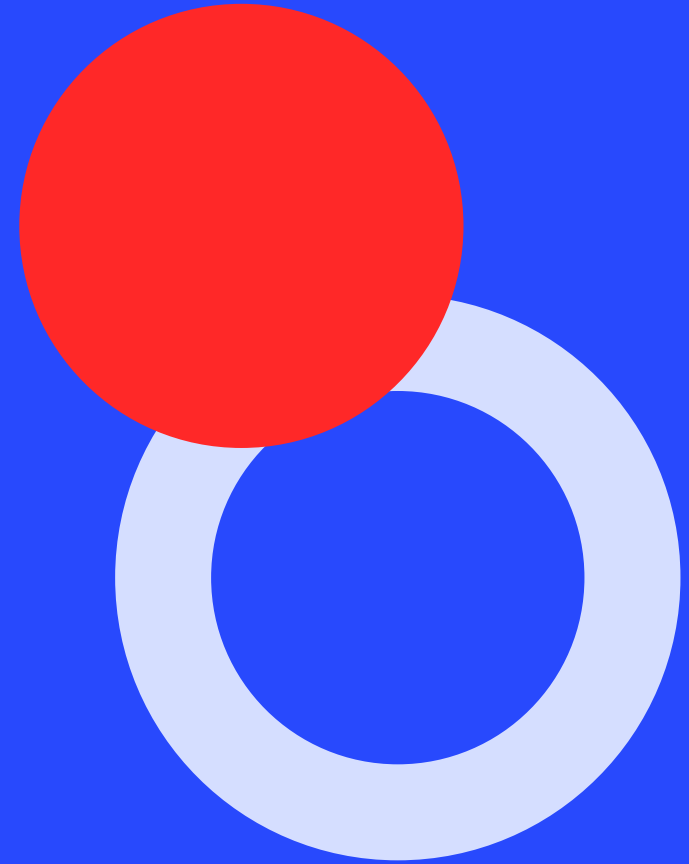
**Five-millimeter trocars will suffice, and utilizing atraumatic bowel graspers, the colon should be inspected and the small bowel should be run.**

**11. In the case of blunt abdominal trauma, the bleeding can be characterized by a standard grading system**

**Generally, grade 2 or 3 hemoperitoneum requires open laparotomy.**

**Depending upon the mechanism of injury, the surgeon may choose to observe patients with grade 1 hemoperitoneum. Grade 0 is a normal examination.**

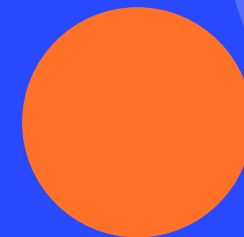
**If pathology is identified that requires a therapeutic intervention , it can be performed by conversion to celiotomy, or laparoscopic treatment.**



# A. General Considerations

The decision to perform diagnostic laparoscopy is based on

Clinical judgment, weighing the sensitivities and specificities of other modalities [computed tomographic (CT) scan, ultrasound, diagnostic peritoneal lavage, mesenteric arteriography] versus the relative morbidity of minimally invasive laparoscopy.



# The complications of laparoscopy for trauma

Include the complications of anesthesia and laparoscopy, but also some that are unique to the trauma patient.

1. Both pneumoperitoneum and reverse Trendelenburg position lead to increased intracranial pressure.
2. Hypothermia may be exacerbated with insufflation of cold carbon dioxide
3. Pneumothorax, from occult pulmonary injury or peritoneal insufflation through a diaphragm injury, may occur.
4. Physiologic changes, such as acidosis, cardiac depression, arrhythmias, and gas absorption causing subcutaneous emphysema, may have more profound consequences in the trauma patient.

**Thank you**

