

# Abdominal and Pelvic Trauma

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# External Landmarks



Anterior abdomen



Flank



Back

# Mechanism of Injury

When should you suspect abdominal and pelvic injury?

## Blunt

- Speed
- Point of impact
- Intrusion
- Safety devices
- Position
- Ejection

## Penetrating

- Weapon
- Distance
- Number, location of wounds

## Explosion

- Combined mechanism

# Blunt Force Mechanism

## Common Injuries

- Spleen
- Liver
- Small bowel
- Pelvis



# Penetrating Mechanism

## Any Organ at Risk

- Stab
  - Low energy, lacerations
- Gunshot
  - Ballistics
  - Type of weapon
  - Shrapnel
- Shotgun
  - Distance from target
  - Spread of projectiles
- Explosion / blast



# Explosions

- ABCDE
- Combination mechanism
  - Blunt
  - Penetrating fragments (multiple)
  - Blast

**Consider proximity, enclosed space, multiple fragments, and secondary impacts (thrown or fall from height).**



# Assessment

How do I determine if there is an abdominal or pelvic injury?

## Physical Exam

- Inspection
- Auscultation
- Percussion
- Palpation
- Examination of pelvis and perineum

## Adjuncts of Primary Survey

- Pelvic x-ray
- FAST
- DPL
- CT Scan

# Assessment

## Factors that Compromise the Exam

- Alcohol and other drugs
- Injury to brain, spinal cord
- Injury to ribs, spine, pelvis



### Caution

A missed abdominal injury can cause a preventable death.



### Pitfalls

Excessive or repeated testing of pelvic stability can be detrimental.



# Adjuncts

## Urinary Catheter

- Monitors urinary output
- Diagnostic
- Decompresses bladder before DPL
- Pelvic fracture patients are at high risk of bladder and urethral injury.
- Hematuria is diagnostic of injury.



# Urethral Injury

**A posterior urethral injury usually occurs in patients with multisystem injuries and pelvic fractures.**

**In contrast, an anterior urethral injury results from a straddle impact and can be an isolated injury.**

# Adjuncts

## Gastric Tube

- Relieves distention
- Decompresses stomach before DPL



Basilar skull / facial fractures can induce vomiting / aspiration

# Adjuncts

## Blood and Urine Tests

- No mandatory blood tests before urgent laparotomy
- Hemodynamically abnormal
  - Type and crossmatch
  - Coagulation studies
- Pregnancy testing
- Alcohol or other drug testing
- Hematuria (gross versus microscopic)

# Adjuncts

## X-ray Studies

- Blunt Trauma: AP chest and AP pelvis
- Penetrating Trauma: AP chest and abdomen with markers (if hemodynamically normal)



# Adjuncts

## Contrast Studies

- Abdominal CT
- Cystogram



**Caution**

Don't delay definitive care!

# Diagnostic Studies – Blunt Trauma

■ TABLE 5-2 Comparison of DPL, Fast, and CT in Blunt Abdominal Trauma

	DPL	FAST	CT SCAN
<b>Advantages</b>	<ul style="list-style-type: none"> <li>• Early diagnosis</li> <li>• Performed rapidly</li> <li>• 98% sensitive</li> <li>• Detects bowel injury</li> <li>• Transport: No</li> </ul>	<ul style="list-style-type: none"> <li>• Early diagnosis</li> <li>• Noninvasive</li> <li>• Performed rapidly</li> <li>• Repeatable</li> <li>• 86%–97% accurate</li> <li>• Transport: No</li> </ul>	<ul style="list-style-type: none"> <li>• Most specific for injury</li> <li>• Sensitive: 92%–98% accurate</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>• Invasive</li> <li>• Specificity: Low</li> <li>• Misses injuries to diaphragm and retroperitoneum</li> </ul>	<ul style="list-style-type: none"> <li>• Operator-dependent</li> <li>• Bowel gas and subcutaneous air distortion</li> <li>• Misses diaphragm, bowel, and pancreatic injuries</li> </ul>	<ul style="list-style-type: none"> <li>• Cost and time</li> <li>• Misses diaphragm, bowel, and some pancreatic injuries</li> <li>• Transport: Required</li> </ul>
<b>Indications</b>	<ul style="list-style-type: none"> <li>• Unstable blunt trauma</li> <li>• Penetrating trauma</li> </ul>	<ul style="list-style-type: none"> <li>• Unstable blunt trauma</li> </ul>	<ul style="list-style-type: none"> <li>• Stable blunt trauma</li> <li>• Penetrating back/flank trauma</li> </ul>

# Diagnostic Studies – Penetrating Trauma

## Hemodynamically Normal Patients

### Lower chest wounds

- Serial exams, thoracoscopy, laparoscopy, or CT scan

### Anterior abdominal stab wounds

- Wound exploration, DPL, or serial exams

### Back and flank stab wounds

- Serial exams, triple-contrast CT scan



# Laparotomy

Which patients warrant a laparotomy?



# Laparotomy

Which patients warrant a laparotomy?

## Indications for Laparotomy – Blunt Trauma

- Hemodynamically abnormal with suspected abdominal injury
- Free air
- Diaphragmatic rupture
- Peritonitis
- Positive FAST, DPL, or CT

# Laparotomy

Which patients warrant a laparotomy?

## Indications for Laparotomy – Penetrating Trauma

- Hemodynamically abnormal
- Free air
- Peritonitis
- Positive DPL or CT
- Evisceration

Early operation is usually the best strategy for GSW

# Pelvic Fractures

- **Significant force**
- **Associated injuries**
- **Pelvic bleeding**
  - **Venous / arterial**



# Pelvic Fractures

## Assessment of Pelvic Fractures

- **Inspection**
  - Limb-length discrepancy, external rotation
  - Open or closed
- **Palpation or pelvic ring, stability**
- **Rectal / GU / vaginal exam**
  - Open or closed? Palpate prostate

# Pelvic Fractures

## Management of Pelvic Fractures

- AB, as usual
- C: Control hemorrhage
  - Wrap / Binder
  - Rule out abdominal hemorrhage
  - Angiography, fixation
  - Pelvic packing



# Pelvic Fractures

## Hemodynamically Abnormal Patients

