The Acute Abdomen

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Causes of the Acute Abdomen

➊ Hemorrhage in the…

- GI tract
- Blood vessel
- GU tract

➋ Perforation of the…

- GI tract
  - Ulcer
  - Infection
  - Parasites
  - cancer
- GU tract

Causes of the Acute Abdomen

❸ **Inflammation**

❹ **Obstruction of the …**

- GI tract
  - Adhesions
  - Hernia
  - Volvulus
  - Tumor
  - Intussusception
  - Parasites
- GU tract
  - Stone
  - Tumor
- Vascular System
  - Thrombus, Embolus

Signs

- **SIGNS** are objective and reproducible findings
  - Tenderness
  - Rigidity
  - Masses
  - Altered bowel sounds
  - Evidence of malnutrition
  - Bleeding
  - Jaundice

Symptoms

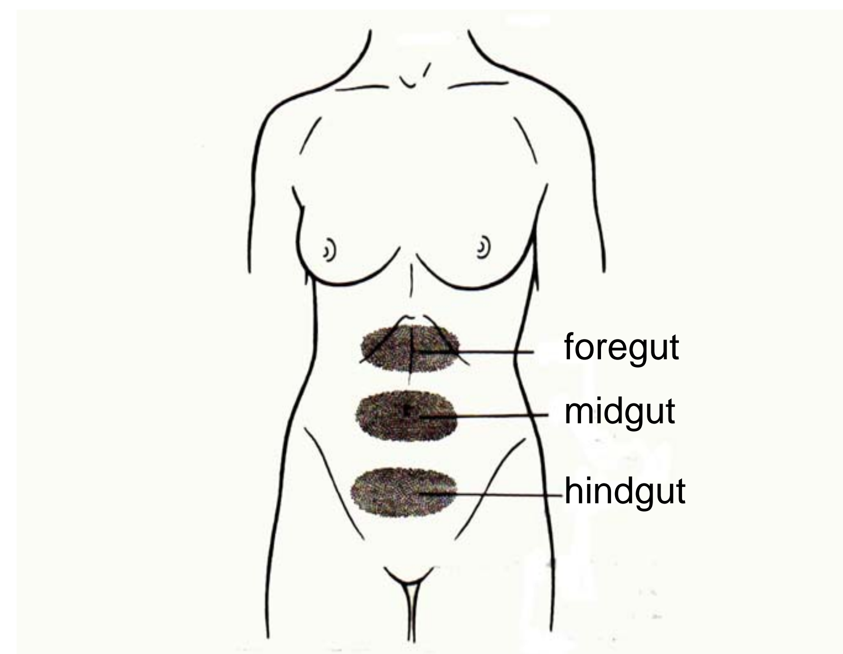
- **SYMPTOMS** reflect a subjective change from normal function
  - *Pain*
  - *Appetite:* anorexia, nausea, vomiting, dysphagia, weight loss
  - *Bowel habits:* bloating, diarrhea, constipation, flatulence

The Physiology of Abdominal Pain

- Abdominal pain from any cause is mediated by either *visceral* or *somatic* afferent nerves
- Several factors can modify expression of pain
  - Age extremes
  - Vascular compromise (pain ‘out of proportion’)
  - Pregnancy
  - CNS pathology
  - Neutropenia

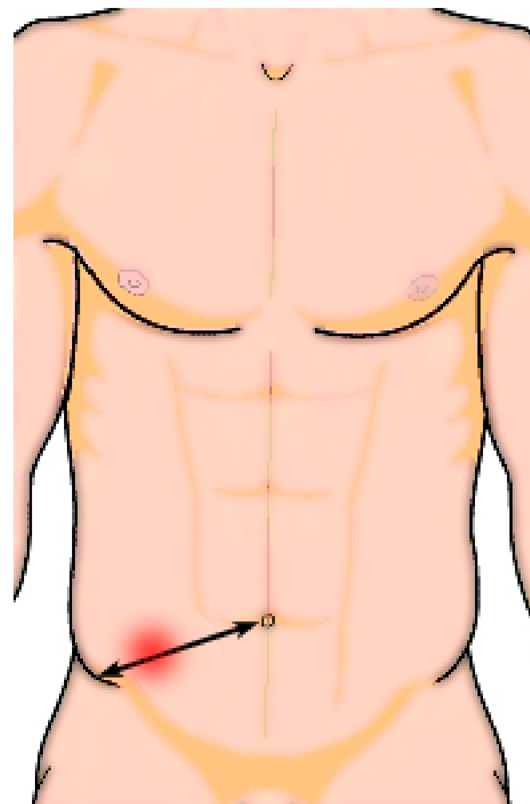
Visceral Pain

- Stimuli
  - Distention of the gut or other hollow abdominal organ
  - Traction on the bowel mesentery
  - Inflammation
  - Ischemia
- Sensation
  - Corresponds to the embryologic origin of the diseased organ (foregut, midgut, hindgut)



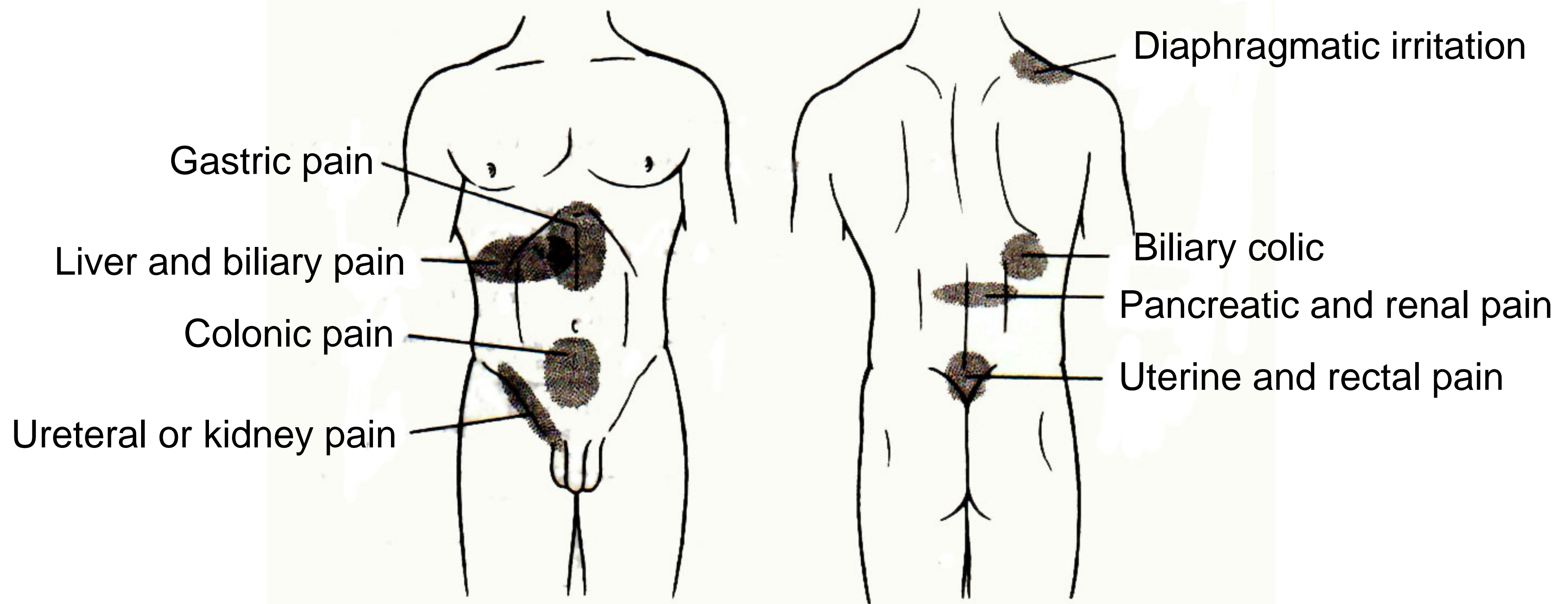
Somatic Pain

- Stimuli
  - Irritation of the peritoneum
- Sensation
  - Sharp, localized pain
  - Easily described
- Cardinal signs
  - Pain
  - Guarding
  - Rebound
  - Absent bowel sounds



Example: McBurney's point in late appendicitis

Patterns of Referred Pain



History

- Pain
  - When? Where? How?
    - Abrupt, gradual
  - Character
    - Sharp, burning, steady, intermittent
  - Referral?
  - Previous occurrence?
- Vomiting
  - Relationship to pain
  - How often? How much?

History

- Nausea? Anorexia?
- Bowel movements
  - *Number*
  - *Character*
  - *Bloody?*
- Past Medical and Surgical History
- Travel History
- Last meal
- Systemic Review

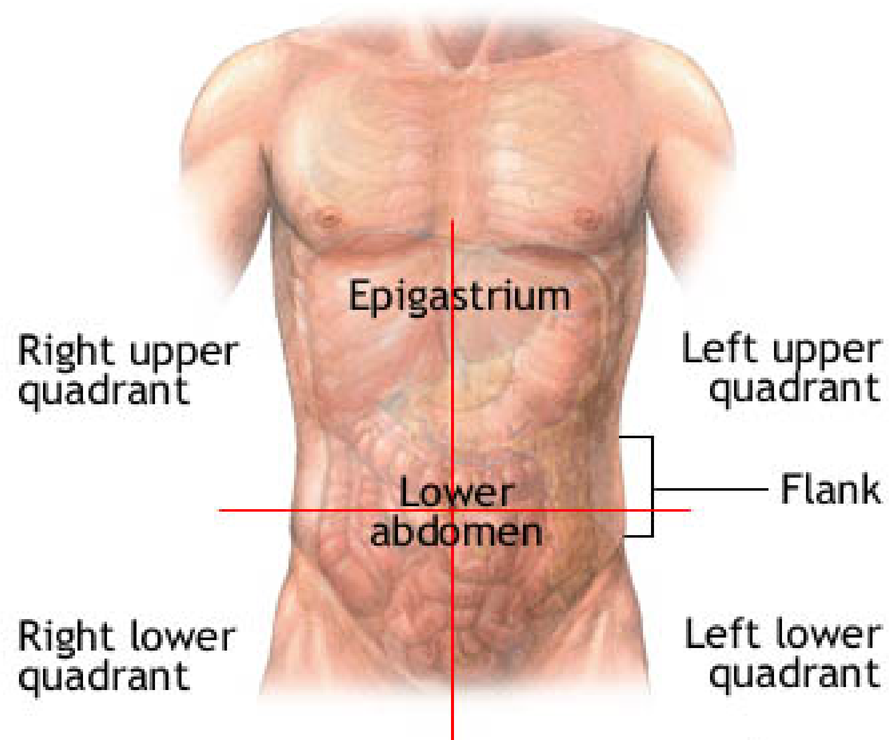
Physical Examination

- Appearance and position of patient
- Vital signs
- Appearance of abdomen
  - Distention
  - Hernia
  - Scars

Physical Examination

- Tenderness
  - Rigidity
  - Masses
- Bowel sounds
- Rectal and Pelvic Examination
- Careful exam of heart, lungs and skin

Physical Examination: The Quadrants



Diagnosis: Right Upper Quadrant (RUQ) Pain

- Investigations
  - XRay
    - Upright chest
    - Upright and supine abdominal
  - Complete Blood count
  - Urinalysis
  - Amylase, Creatinine, BUN, Electrolytes

Differential Diagnosis: RUQ Pain

CONDITION	CLUES
Biliary colic, acute cholecystitis	Recurrent attacks, tender over gall bladder area
Acute hepatitis	Alcohol history, jaundice, medications
Right pyelonephritis	Dysuria, fever, costovertebral angle tenderness
Congestive heart failure	Edema, dyspnea, elevated JVP
Retrocecal appendicitis	Shift of pain, tenderness
Right lower lobe pneumonia	Fever, tachypnea, bronchial breathing

Diagnosis: Left Upper Quadrant (LUQ) and Epigastric Pain

- Investigations
  - Upright chest XR
  - Upright and supine abdominal XR
  - CBC
  - Amylase and lipase (if available)

Differential Diagnosis: LUQ and Epigastric Pain

CONDITION	CLUES
Splenic rupture	History of trauma or splenic disease
Fractured ribs	History of trauma, gross deformity, extreme tenderness on palpation
Pancreatitis	History of alcohol consumption, history of similar event, elevated labs
Gastritis / Peptic ulcer disease	Recurrent, relationship to meals, relationship to posture
Pneumonia	Fever, XR findings, bronchial breathing

Diagnosis: Right Lower Quadrant (RLQ) Pain

- Investigations
  - Urinalysis (to exclude obvious urinary causes)
  - Pregnancy test
  - Ultrasound
  - Complete blood count

Differential Diagnosis: RLQ Pain

CONDITION	CLUES
Acute appendicitis	Shift of pain, anorexia, localized tenderness
Mesenteric adenitis	Fever, inconstant signs
Right renal colic	Colicky pain, hematuria
Torsed right testis	Tender swollen testis, usually young age
Crohn’s disease	Recurrent, several days history
Gynecologic causes	…see next

Gynecologic Causes of RLQ Pain

CONDITION	CLUES
Ruptured follicle	Fever, cervical excitation, discharge
Torsion of ovary	Midcycle, sudden onset
Ruptured ectopic pregnancy	Severe pain, vomiting
Pelvic inflammatory disease	Sudden onset, amenorrhea, shock

Diagnosis: Left Lower Quadrant (LLQ) Pain

- Pregnancy test
- Urinalysis to exclude unsuspected urinary source
- Ultrasound
- Complete blood count
- Upright and supine abdominal XR
- CT scan if diverticular disease is suspected

Differential Diagnosis: LLQ Pain

CONDITION	CLUES
Diverticular disease	Elderly patient, recurrent
Acute urinary retention	Palpable bladder, difficulty passing urine
Urinary tract infection	Dysuria, frequency
Inflammatory bowel disease	Recurrent attacks, diarrhea (+/- mucus, blood)
Large bowel obstruction	Colicky pain, obstipation
Left renal colic	Colicky pain, hematuria
Torsion of testis	Tender, swollen testis, young age
Gynecologic causes as for RLQ pain	

Diagnosis: Periumbilical Pain

- Investigations
  - CBC
  - Amylase and lipase, if available
  - If severe, unrelenting pain → urgent surgical referral
  - If pain colicky and no flatus → erect and supine abdominal XR
  - If diarrhea and vomiting → stool tests

Differential Diagnosis: Periumbilical Pain

CONDITION	CLUES
Gastroenteritis	Vomiting and diarrhea
Constipation	Colicky pain, hard stool
Inflammatory bowel disease	Recurrent diarrhea, +/- mucus and blood
Early appendicitis	Nausea, short history
Small bowel obstruction	Colicky pain, vomiting, no flatus
Ischemic bowel	Severe pain, tenderness less marked, rectal bleeding

Common Gastrointestinal Causes of the Acute Abdomen

- Appendicitis
- Perforated peptic ulcer
- Intestinal perforation
- Meckel's diverticulum
- Diverticulitis
- Chronic irritable bowel disease
- Gastroenteritis

Common Visceral Causes of the Acute Abdomen

- Acute pancreatitis
- Acute calculous cholecystitis
- Acalculous cholecystitis
- Hepatic abscess
- Ruptured hepatic tumor
- Acute hepatitis
- Splenic rupture

Common Gynecologic Causes of the Acute Abdomen

- Ruptured ovarian cyst
- Ovarian torsion
- Ectopic pregnancy
- Acute salpingitis
- Pyosalpinx
- Endometritis
- Uterine rupture

Extra-Abdominal Causes of the Acute Abdomen

- Supradiaphragmatic
  - Myocardial infarction
  - Pericarditis
  - Left lower lobe pneumonia
  - Pneumothorax
  - Pulmonary infarction
- Hematologic
  - Sickle cell disease
  - Acute leukemia
- Drugs
- Metabolic
- Nervous System
  - Herpes Zoster
  - Tabes dorsalis
  - Nerve root compression
- Endocrine
  - Diabetic ketoacidosis
  - Addisonian crisis

Immediate Treatment of the Acute Abdomen

1. Start large bore IV with either saline or lactated Ringer's solution
2. IV pain medication
3. Nasogastric tube if vomiting or concerned about obstruction
4. Foley catheter to follow hydration status and to obtain urinalysis
5. Antibiotic administration if suspicious of inflammation or perforation
6. Definitive therapy or procedure will vary with diagnosis

Remember to reassess patient on a regular basis.