Physical Examination of the Abdomen

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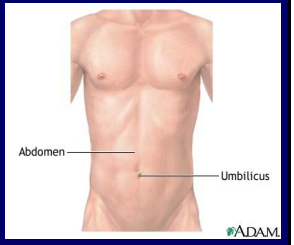
Philip Davis, DNP, MBA, ANP-BC, Melissa Baughcum, ANP – BC, for contributions

Objectives

- To discuss the elements of the general history for the abdominal examination
- To evaluate the major components of a thorough abdominal examination
- To familiarize with the "special maneuvers" relevant for the abdominal examination
- To demonstrate knowledge of the common differential diagnoses of the abdomen

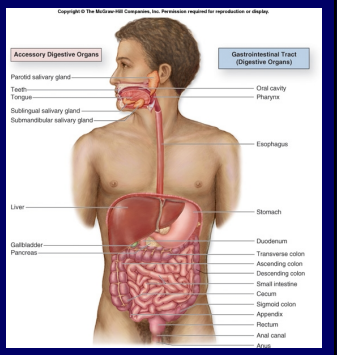
Abdomen

- What structures and organ systems are you assessing?
  - Skin
  - Musculoskeletal
  - Gastrointestinal tract
  - Genitourinary tract
  - Vasculature
  - Lymphatics



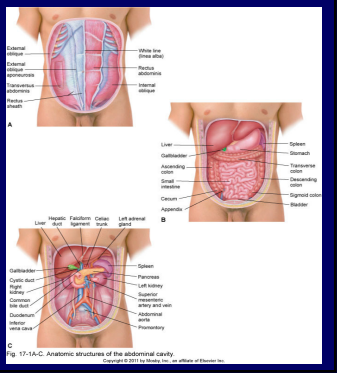
Anatomy Review

- Organs
  - Alimentary Tract
    - Mouth
    - Esophagus
    - Stomach
    - Small intestine
      - Duodenum
      - Jejunum
      - Ileum
    - Large intestine
      - Cecum
      - Ascending colon
      - Transverse colon
      - Descending colon
      - Sigmoid colon
      - Rectum
      - Anus

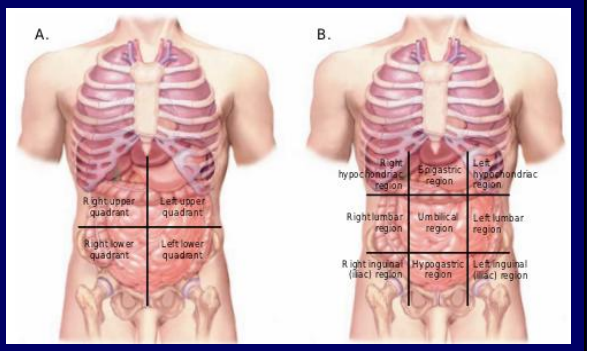


Anatomy Review

- Organs
  - Liver
  - Gallbladder
  - Pancreas
  - Spleen
  - Kidneys, Ureters, Bladder
- Musculature and Connective Tissues
- Vasculature
- Peritoneum



Landmarks



Anatomy Review

- RUQ
  - liver & gallbladder
  - pylorus & duodenum
  - head of pancreas
  - portion of right kidney
  - right adrenal gland
  - hepatic flexure of colon
  - portions of colon
- RLQ
  - lower pole of right kidney
  - cecum and appendix
  - portion of ascending colon
  - ovary and salpinx
  - right ureter
  - right spermatic cord

- LUQ
  - left lobe of liver
  - spleen and stomach
  - body of pancreas
  - portion of left kidney
  - left adrenal gland
  - splenic flexure of colon
  - portions of colon
- LLQ
  - lower pole of left kidney
  - sigmoid colon
  - portion of descending colon
  - ovary and salpinx
  - left ureter
  - left spermatic cord

Upper abdominal pain	
Acute	Chronic
Kidney stones Gallstone Pancreatitis Cholecystitis Peptic Ulcer disease Myocardial infarction AAA Costochondritis	Gastroparesis GERD Gastritis – H.pylori Irritable bowel syndrome Angina
Lower Abdominal pain	
Acute	Chronic
Appendicitis Pelvic inflammatory disease Ruptured ovarian follicle Ectopic pregnancy Cystitis Inflammatory bowel disease Diverticulitis Prostatitis	Irritable bowel syndrome Chronic cystitis Chronic prostatitis Malignancy Endometriosis

Developmental Variations
Infants and children

- By 36-38 weeks
  - GI tract capable of adapting to extrauterine life
- Normal variations
  - Small umbilical hernia common
    - Should be easily reducible
    - Closed by 1-2 years
  - Diastasis rectus abdominus
    - Separation 1-4 cm does not necessitate repair unless herniation of abdominal muscles
  - Protuberant abdomen
    - "potbellied appearance until ~ 5 years

Developmental Variations

- Pregnant Women
  - Rectus abdominis may separate (diastasis recti)
  - Umbilicus flattens/protrudes
  - Striae may form
  - Linea nigra often appears
  - Colon displaced upward & peristalsis decreases
  - Gall bladder distends
- Older Adults
  - Intestinal motility decreases
  - May be reduced circulation to the intestine
  - Decreased secretion of digestive enzymes
  - Liver size decreases
  - Hepatic blood flow decreases

History

- History of Present Illness- OLDCARTS!
  - Abdominal pain
  - Indigestion/reflux
  - Nausea and vomiting
    - Color, bilious, blood
  - Change in bowel habits
    - Diarrhea, constipation, BRB, melena
  - Jaundice
  - Urinary symptoms
    - Dysuria, urinary retention
  - Hematuria

Urinary Incontinence

see p. 463, 497, 498 Bates 12th text

- Stress incontinence- due to poor urethral sphincter tone or poor support of the bladder
- Urge incontinence- urgency is followed by immediate involuntary leakage- due to stroke, brain tumor, dementia
- Overflow incontinence- due to obstruction of bladder outlet, BPH or tumor
- Functional incontinence- due to impaired cognition, MSK problems, or immobility

History

- Past Medical History
  - Major illnesses (DM, HTN, heart disease, CVA, cancer or kidney disease)
  - GI disorders
  - Liver problems
  - UTIs
  - Surgeries/injuries
  - Blood transfusions
  - Medications
  - Allergies- and reaction!

History

- Family History
  - DM, HTN, heart disease, CVA, cancer
  - Gallbladder or kidney disease
  - Malabsorption syndromes
  - Colorectal cancer

- Social History
  - Alcohol intake, tobacco abuse, recreational drug use
  - Nutrition (24 hour dietary recall); caffeine intake
  - Employment, living situation, sexual history
  - Physical or emotional stress
  - Recent travel
  - Exposure to infectious diseases

History

ROS:

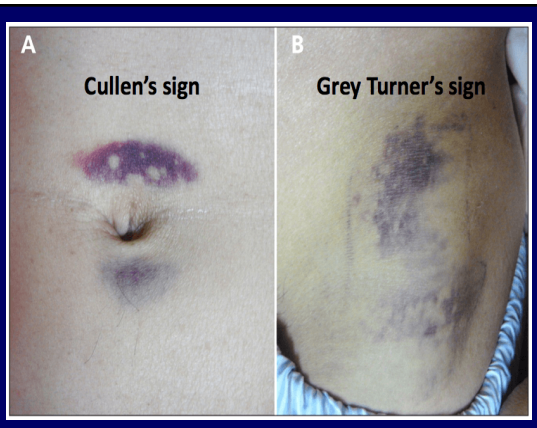
- General
- CV
- Pulmonary
- GI
- GU
- Possibly other systems

Examination Techniques

- General Considerations
  - Good light and adequate exposure
  - Empty bladder
  - Provider stands at patient's RIGHT side
  - Patient supine, arms at side, knees slightly flexed
  - Examine non-painful side first
  - "Visualize" underlying anatomy
  - Watch patient's face for signs of discomfort during the exam
    - Voluntary vs involuntary

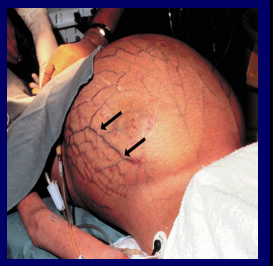
Physical Examination: Inspection

- Skin characteristics
  - Color
    - General (jaundice)
    - Grey Turner sign
  - Scars
  - Rashes
  - Lesions
  - Striae
  - Birth marks
- Contour
  - General
    - Flat, rounded, concave (scaphoid)
  - Symmetry
    - Distention, bulges, hernia
  - Umbilicus
    - Location
    - Color (Cullen sign)
- Movement
  - Surface motion (peristalsis)
  - Pulsations



Concerning findings:

- Rash
  - Papules, vesicles, and macules
- Dilated veins
  - Caput medusae
- Abdominal asymmetry
  - Mass lesion
  - Swelling
  - Herniation
- Large Pulsations



Physical Assessment

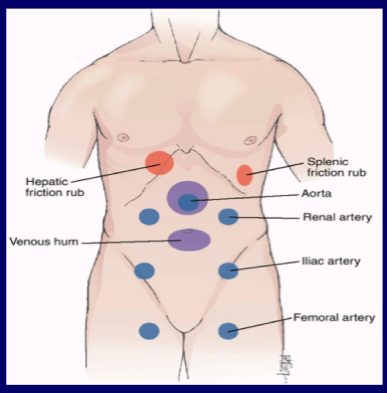
- After inspecting the abdomen, what is the next step in the physical assessment??

Physical Assessment: Auscultation

- Bowel Sounds
  - Use warmed diaphragm and light pressure
  - Listen in all four quadrants
  - Note frequency and character
    - Normal
      - Clicks or gurgles
      - Irregularly, 5-35 per minute
      - Borborygmi- "stomach growling"
      - "Normoactive x 4"
    - Abnormal
      - Hyperactive- gastroenteritis, early intestinal obstruction or hunger
      - Hypoactive- peritonitis, paralytic ileus
      - Absent- inability to hear after 5 continuous minutes- EMERGENCY!!

Physical Assessment: Auscultation

- Other
  - Bruit
    - Use bell of stethoscope
    - Arteries
      - Aorta
      - Renal
      - Iliac
      - Femoral
  - Friction Rub
    - Use diaphragm of stethoscope
    - Listen over liver and spleen
    - Indicates inflammation
  - Venous Hum
    - Use bell of stethoscope
    - Soft, low pitched, continuous 'hum'
    - Epigastric area and umbilicus
    - Indicates increased collateral circulation between portal and systemic venous systems



Physical Examination: Percussion

- Why?: Assessment of organ size or identification of a possible mass
- General
  - Tympany
    - Stomach
    - Intestines
  - Dullness
    - Organs
    - Solid masses
    - Distended bladder

Percussion

How?

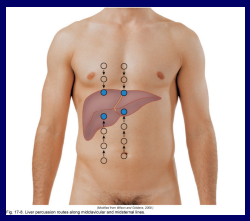
- Flat hand placed on relaxed abdomen
- Tap third digit on the middle phalange
- Fist percussion for CVA tenderness

Why?

- Assessment of organ size
- Identification of possible mass lesion

Physical Examination: Percussion

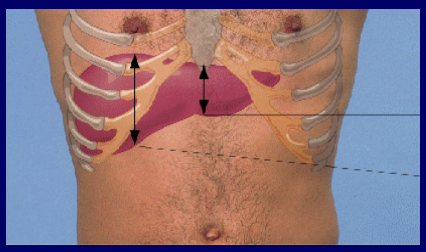
- Liver
  - Right MCL
    - Lower Boarder
      - Go up from area of tympany to area of dullness
    - Upper Boarder
      - Go down from area of resonance MCL at the nipple line to area of dullness
    - Normal vertical span = 6–12cm



- Midsternal
  - Same Procedures
  - Normal midsternal span = 4-8cm

Percussion – Liver

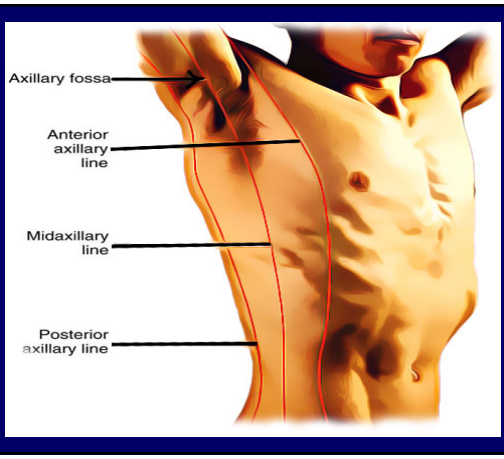
Liver Percussion



- 4-8 cm
- 6-12 cm

Physical Examination: Percussion

- Spleen
  - Posterior to left MAL
    - Small area of dullness may be heard from 6th to 10th rib
  - Lowest ICS in left AAL
    - Before and after a deep breath by the patient
    - Area should remain tympanic
- Video:



Physical Examination: Percussion

- Kidneys
  - Have patient sitting
    - Costovertebral Angle Tenderness (CVA tenderness)
      - Place palm of hand over the right costovertebral angle
      - Strike hand with the ulnar surface of the first of other hand.
      - Repeat measure for other side
      - Patient should feel a thud but no pain

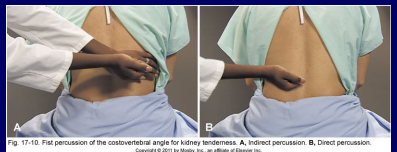
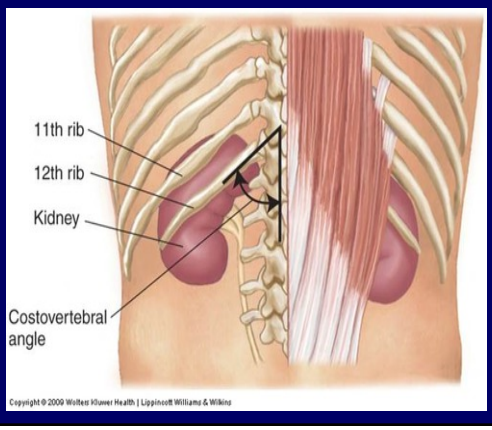


Fig. 17-10. Flat percussion of the costovertebral angle for kidney tenderness. **A,** Indirect percussion. **B,** Direct percussion.



Physical Examination: Palpation

- Done to assess masses, fluid, areas of tenderness
  - Light palpation
    - All 4 quadrants
    - ≤ 1 cm deep
    - Identify muscular resistance, tenderness, masses
  - Deep palpation
    - All 4 quadrants
    - 5 to 8 cm deep
    - Delineates organs, detects deeper masses

Peritoneal Inflammation

- Pain with:
  - Cough
  - Light percussion
  - Rebound tenderness
  - Rigidity
  - Guarding

Identification of Abdominal Masses

- Characterize masses by
  - Location
  - Size
  - Shape
  - Consistency
  - Tenderness
  - Pulsation
  - Mobility
  - Movement with respiration
  - Superficial vs. intraabdominal

Palpation- Liver

- Liver
  - Place one hand under patient, "lifting" the liver towards the abdominal wall
  - Feel for lower border at right costal margin when pt takes deep breath
  - If felt, should be smooth, firm, even and nontender

Liver Palpation

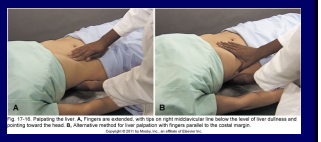


Fig. 17-16. Palpating the liver. **A.** Fingers are extended, with tips on right midclavicular line below the level of liver dullness and pointing toward the head. **B.** Alternative method for liver palpation with fingers parallel to the costal margin.

Palpation- Liver

- Liver
  - Alternative Techniques
    - "Hooking"
      - Stand on patients right side, facing his/her feet.
      - Have patient take deep breath as you press in an up toward the costal margin.
      - Try to feel liver edge as it meets your fingers.
    - Scratch Test
      - With stethoscope over liver, lightly scratch the abdominal surface, moving toward the liver.
      - Sound intensifies over the liver.

Fig. 17-17. Palpating the liver with fingers hooked over the costal margin.

Fig. 17-18. Scratch technique for evaluating the liver. With stethoscope over the liver, lightly scratch the abdominal surface, moving toward the liver. The sound will be intensified over the liver.

Palpation:

- Umbilical ring
  - Bulges or masses

Murphy's Sign Video

- Gallbladder
  - RUQ below liver margin at lateral border of the rectus abdominis muscle
  - Usually nonpalpable
    - Tender and palpable – suspect cholecystitis
    - Nontender and enlarged- suspect common bile duct obstruction
    - Murphy's sign- Have pt take deep breath….if inflamed gallbladder is palpated, patient will experience pain and abruptly halt inspiration

Palpation- Spleen

- Spleen
  - Stand on patient's right side
  - Reach across, have left hand "lift" the spleen towards abdominal wall
  - Feel below the left costal margin with right hand
  - Usually nonpalpable in adults
  - Be gentle!

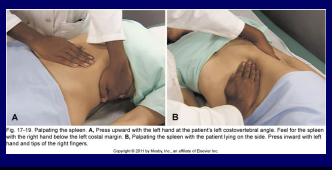


Fig. 17-19. Palpating the spleen. **A**, Press upward with the left hand at the patient's left costovertebral angle. Feel for the spleen with the right hand below the left costal margin. **B**, Palpating the spleen with the patient lying on the side. Press inward with left hand and tips of the right fingers.

Physical Examination: Palpation

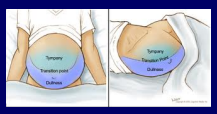
- Kidneys
  - Same procedure as for spleen, except "lift" flank
  - Left kidney usually not palpable
  - Right kidney normally palpated in thin women
  - Bilateral kidney enlargement suggests polycystic kidney disease
- Aorta
  - Place thumb on one side and fingers on the other side
  - Pulsation should be slightly left of the midline and no more than 3.0 cm wide
- Urinary Bladder
  - Palpable in healthy patient only when distended with urine
  - Suprapubic tenderness may indicate cystitis

Special Tests/Techniques:

Ascites Assessment:

Neither of these are specific or completely reliable

Shifting Dullness:



Fluid Wave:

Abdominal Tests

- Rebound Tenderness (Blumberg sign)
  - Used to determine peritoneal irritation
  - Perform at end of examination
  - Hold hand at 90 degree angle to abdomen, press gently and deeply into remote area away from discomfort, then rapidly withdraw hand
  - Positive test creates sharp, stabbing pain at site of peritoneal irritation on the “rebound” of structures that were compressed

Abdominal Tests

- Iliopsoas Muscle Test (AKA: Psoas Sign)
  - Performed when suspect appendicitis
  - Patient raises leg off table while examiner applies resistance
  - Positive sign, patient will experience lower quadrant pain

  Psoas Sign
- Obturator Muscle Test
  - Performed when suspect ruptured appendix or pelvic abscess
  - Patient flexes R leg at hip and knee to 90 degrees, examiner rotates the leg laterally and medially
  - Positive sign, patient will experience pain in the hypogastric (pubic) area

  Obturator Sign

Abdominal Signs

- McBurney
  - Rebound tenderness and sharp pain when McBurney's point is palpated — Mcburney's Point
    - Appendicitis
- Rovsing
  - Press deeply and evenly in the LLQ, then quickly withdraw your fingers. Positive if pain is felt in the RLQ. — Rovsing
    - Peritoneal irritation
    - Appendicitis
  - Markle (heel jar) - Pt raises up on toes and then allows heels to hit the floor, thus jarring the body. Action will cause abdominal pain if positive
    - Peritoneal irritation
    - Appendicitis

Abdominal Signs

- Cullen
  - Ecchymosis around umbilicus
    - Hemoperitoneum
    - Pancreatitis
    - Ectopic pregnancy
- Kehr
  - Abdominal pain radiating to left shoulder
    - Spleen rupture
    - Renal calculi
    - Ectopic pregnancy
- Grey-Turner
  - Ecchymosis of flanks
    - Hemoperitoneum
    - Pancreatitis
- Murphy
  - Abrupt cessation of inspiration on palpation of gallbladder
    - Cholecystitis

Cullen Sign vs. Grey Turner

Grey-Turner's Sign

What are 5 tests that should be done when appendicitis is suspected?

1. **Rebound tenderness/ McBurney sign**
2. **Rovsing sign**
2. **Psoas sign**
3. **Obturator sign**
5. **Markle (heel jar) sign**

References

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