

Acute Abdomen Workbook



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The information contained in this presentation was obtained from multiple sources. It is the responsibility of the user to update themselves on current medical concepts and treatments as well as the current medical practices in the states where they practice as a healthcare professional.

Abdominal Pain

Parietal Pain	Visceral Pain	Hollow Organ Pain
<ul style="list-style-type: none"> • Pain is localized & intense – Irritant felt precisely where & when applied – Noxious stimuli irritate the parietal peritoneum – Pain is steady & constant – Relieved with legs up in fetal position – Aggravated by cough or movement <p>Examples:</p> <ul style="list-style-type: none"> – AAA – Appendicitis – Cholecystitis – Diverticulitis – Pancreatitis – Perforation – Splenic Rupture 	<ul style="list-style-type: none"> • Pain is poorly localized – Usually felt in the ventral midline of the abdomen – Noxious stimuli irritate an abdominal viscus – Viscera are sensitive mostly to stretch & ischemia – Visceral pain is dull, cramping, gnawing or burning sensations <p>Examples:</p> <ul style="list-style-type: none"> – Mesenteric Ischemia (initial) – Obstruction – Pancreatitis – Pregnancy, Ectopic – Splenic Rupture 	<ul style="list-style-type: none"> • Pain occurs during peristaltic activity. – Pain caused by stretching & distention of hollow organ – Intermittent muscle contractions – Intensity depends on circumference of lumen – Crescendo – Decrescendo – Colicky <p>Examples:</p> <ul style="list-style-type: none"> – GI Tract (gastroenteritis / diarrhea) – Ureters (stone) – Gallbladder / Biliary tract (stones) – Bladder (UTI) – Fallopian tubes (Ectopic pregnancy / infection)

Solid Organ Pain	Referred Pain	Helpful Hints
<ul style="list-style-type: none"> • Pain is constant – Usually solid organs are insensitive to pain – Pain occurs when the capsule surrounding the organ or an adjacent structure becomes involved <p>Examples:</p> <ul style="list-style-type: none"> – Liver <ul style="list-style-type: none"> • Hepatic congestion – Spleen <ul style="list-style-type: none"> • Trauma / inflammation – Pancreas <ul style="list-style-type: none"> • Pancreatitis – Kidney <ul style="list-style-type: none"> • Trauma / inflammation – Lungs <ul style="list-style-type: none"> • Trauma / inflammation 	<ul style="list-style-type: none"> • Referred pain has both visceral and spinal components. – These are found in the dermatome corresponding to the viscera's message entrance into the spinal cord. – Both Vague & Precise Pain can be felt by the patient <p>Examples:</p> <ul style="list-style-type: none"> – AAA <ul style="list-style-type: none"> • Back, flank, abdomen, groin – Appendicitis <ul style="list-style-type: none"> • Epigastrium, periumbilical, RLQ – Cholecystitis <ul style="list-style-type: none"> • Epigastrium, RUQ, R scapula – Pancreatitis <ul style="list-style-type: none"> • Epigastrium, abdomen, back, flanks – Perforation <ul style="list-style-type: none"> • Epigastrium, abdomen, shoulder – Pregnancy, Ectopic <ul style="list-style-type: none"> • Abdomen, shoulder – Splenic Rupture <ul style="list-style-type: none"> • RUQ, abdomen, shoulder 	<ul style="list-style-type: none"> • Eight organ systems within single cavity <ul style="list-style-type: none"> – Pain is memorable – Patient can describe onset & evolution • Pain History <ul style="list-style-type: none"> – Time of onset – Location of the pain – Radiation – Factors that lessen or increase the pain – Quality of the pain – Changes in stool frequency / character – Associated symptoms <ul style="list-style-type: none"> • Weight loss • Fever • Nausea / vomiting <ul style="list-style-type: none"> – Character of vomitus • Flatulence / Constipation / Diarrhea • Jaundice • Bloating • Medical / Surgical History <ul style="list-style-type: none"> – Hx of CAD / PAD – Prior abdominal surgeries – Family hx of abdominal pain syndromes <ul style="list-style-type: none"> • Sickle cell anemia • Mediterranean Fever • Porphyria • Medications <ul style="list-style-type: none"> – Steroids, pain meds, NSAID's, Erythromycin

Physical Exam Clues

Physical Examination Clues	Potential Diagnoses
General Appearance: Sunken eyes, rapid & shallow respirations Writhing in bed Stillness in bed	Dehydration / Bleed / Obstruction / Peritonitis GI, Stones, UTI, ectopic pregnancy / infection AAA, Appendicitis, Cholecystitis, Diverticulitis, Pancreatitis, Perforation, Splenic Rupture, Ectopic Pregnancy
HEENT / Skin Icterus Spider Nevi Blindness Sunken cheeks & hallow-eyed appearance (post repeated vomiting) Pallor of cheeks, tongue, lips & fingernails Flaring of the alae nasi Cool, moist, clammy skin	Hepatitis / Cholangitis / Choledocholithiasis Bacterial Peritonitis Aortic dissection Obstruction / Peritonitis Hemorrhage Pneumonia / Peritonitis Potential shock
Respiratory Restriction Percussion dullness, ↓ breath sounds, ↓ tactile fremitus Percussion dullness, ↓ breath sounds, crackles	Peritoneal effusion Pleural effusion Pneumonia, consolidation
CVS ↓ JVP Dysrhythmia, S4, mitral insufficiency murmur	Volume depletion (Bleed / perforation) MI
Abdomen Visible peristalsis Bulging flanks Caput Medusa Loss of liver dullness Rigid abdomen, guarding, rebound tenderness Shift dullness, fluid waves Absent bowel sounds Visible hernia Carnett's Sign († tenderness to palpation of contracted Abd) Murphy's Sign (Palpation of RUQ / pt takes deep breath) Psoas Sign (Flexion of thigh against resistance) Obturator Sign (Flexion of thigh with internal / external rotation) Fist Percussion Sign (Percussion over anterior wall of chest) Rovsing's Sign (Palpation of LLQ causes pain in RLQ) Britton's Sign (Cremasteric reflex produced by RLQ pressure) Epicritic Hyperesthesia (Skin sensitivity to pin touch) Markle Sign (Jar tenderness / heel-drop) Blumberg Sign (Rebound tenderness) Kehr's Sign (Referred pain to shoulder) Cullen's Sign (Periumbilical ecchymosis) Subcutaneous Crepitus (Small fluctuant nodules felt) CVA Tenderness (Tap over posterior diaphragm / costal margin)	Bowel obstruction Ascites Portal hypertension Perforated viscus Peritonitis Ascites Paralytic ileus / late bowel obstruction Strangulated hernia Suggests abdominal wall cause of pain Cholecystitis Retrocecal appendicitis Retrocecal appendicitis / local abscess / hematoma / inflammatory fluid in pelvis Acute inflammation in diaphragm, liver, stomach or spleen Appendicitis Appendicitis Appendicitis Peritoneal inflammation, appendicitis, cholecystitis, abscess, acute diverticulitis, abdominal organ infarction Same as above in Markle sign Cholecystitis, perforation Retroperitoneal bleed Gas gangrene, air under skin Kidney stones
Rectal Tenderness Mass Rectal Fissure Occult blood	Retrocecal or pelvic appendicitis / prostatitis diverticulitis / tubo-ovarian pathology Rectal carcinoma Crohn's Disease Ischemic colitis / peptic or duodenal ulcer
Pelvic Tenderness Mass	Ectopic pregnancy / Ovarian cyst / PID Ovarian cyst / tumor / abscess

“Signs” to look for during Abdominal Examination

- Aaron's sign:** Referred pain felt in the epigastrium upon continuous firm pressure over McBurney's point. It can indicate appendicitis. Aaron's sign is named for Charles Dettie Aaron, an American gastroenterologist.
- Allodynia (Cutaneous Hyperesthesia):** Area of hypersensitivity often found prior to perforation, e.g., appendicitis in RLQ.
- Ballance's sign:** Dullness to percussion in the left flank LUQ and shifting dullness to percussion in the right flank seen with splenic rupture/hematoma. The dullness in the left flank is due to coagulated blood, the shifting dullness on the right due to fluid blood. It is named for Charles Alfred Ballance, an English surgeon, 1856-1936.
- Bassler sign:** In chronic appendicitis, pinching the appendix between the thumb and the iliacus muscle causes sharp pain.
- Blumberg sign:** Transient abdominal wall rebound tenderness which can indicate peritoneal inflammation.
- Boas' or Boas's sign:** Hyperaesthesia below the right scapula which can be a symptom in acute cholecystitis. Its namesake is Ismar Isidor Boas (1858-1938), German physician and first licensed GI specialist in his country.
- Britton's sign:** Cremasteric reflex produced by pressure applied to the right lower quadrant can indicate appendicitis.
- Carnett's sign:** Loss of abdominal tenderness when abdominal wall muscles are contracted which can indicate an intra-abdominal source of abdominal pain.
- Castell's sign:** Castell's method involves first placing the patient in the supine position. With the patient in full inspiration and then full expiration, percuss the area of the lowest intercostal space (eighth or ninth) in the left anterior axillary line. If the note changes from resonant on full expiration to dull on full inspiration, the sign is regarded as positive. The resonant note heard upon full expiration is likely to be due to the air-filled stomach or splenic flexure of the colon. When the patient inspires, the spleen moves inferiorly along the posterolateral abdominal wall. If the spleen is enlarged enough that the inferior pole reaches the eighth or ninth intercostal space, a dull percussion note will be appreciated, indicating splenomegaly.
- Chandelier sign:** Extreme lower abdominal and pelvic pain with movement of the cervix which can indicate pelvic inflammatory disease.
- Charcot's sign:** Intermittent right upper abdominal pain, jaundice, and fever which can indicate choledocholithiasis.
- Chilaiditi syndrome:** A rare condition when pain occurs due to transposition of a loop of large intestine (usually transverse colon) in between the diaphragm and the liver, visible on plain abdominal X-ray or chest X-ray. Normally this causes no symptoms, and this is called **Chilaiditi's sign**. Chilaiditi syndrome refers only to complications in the presence of Chilaiditi's sign. These include abdominal pain, torsion of the bowel (volvulus) or shortness of breath. The sign can be permanently present, or sporadically. This anatomical variant is sometimes mistaken for the more serious condition of having air under the diaphragm (pneumoperitoneum) which is usually an indication of bowel perforation. This may lead to unnecessary surgical interventions.

- Claybrook sign:** Auscultation reveals accentuation of breath and cardiac sounds through the abdominal wall which can indicate a ruptured abdominal viscus.
- Costovertebral Angle Tenderness (CVA):** Tapping over the posterior diaphragm / costal margin can indicate kidney stones.
- Cruveilhier sign:** Varicose veins at umbilicus (caput medusae) which can indicate portal hypertension.
- Cullen's sign:** Periumbilical bruising which may indicate hemoperitoneum.
- Dance's sign:** Retraction of the right lower quadrant of the abdomen, which can indicate intussusception, i.e. those with intussusception may have retraction of the right iliac fossa. It was originally described by the French pathologist Jean Baptiste Hippolyte Dance (1797-1832).
- Danforth sign:** Shoulder pain with inspiration can indicate hemoperitoneum.
- Diastasis Recti:** When the patient lifts their head in the supine position, the abdominal rectus muscles separate.
- Epicritic Hyperesthesia:** Skin sensitivity to pin touch can indicate peritoneal inflammation, i.e., appendicitis, diverticulitis.
- Everted Umbilicus:** Seen when there is an increase in intraabdominal pressure, e.g., fluid or masses.
- Fist Percussion sign:** Pain elicited in upper abdomen when sternum tapped with fist can indicate acute inflammation of any of the following: diaphragm, liver, peritoneum, stomach, or spleen
- Fothergill's sign:** If a mass in the abdominal wall does not cross midline and does not change with flexion of the rectus muscles, this is a positive sign for a rectus sheath hematoma. It is named for John Fothergill.
- Grey Turner sign:** A local area of discoloration around the umbilicus and flanks can indicate acute hemorrhagic pancreatitis or retroperitoneal bleed.
- Hannington-Kiff sign:** There is an absent adductor reflex in the thigh in the presence of a positive patellar reflex. It occurs in patients with an obturator hernia, due to compression of the obturator nerve. The adductor reflex is elicited by tapping over either the medial epicondyle of the femur or the medial condyle of the tibia, which should cause the adductor muscles of the hip to contract, moving the leg inwards. The sign was described by John G Hannington-Kiff in 1980.
- Iliopsoas sign:** Elevation and extension of leg against resistance causes pain which can indicate appendicitis with retrocecal abscess.
- Kehr's sign:** Left shoulder pain when supine and pressure is placed on the left upper abdomen which can indicate a hemoperitoneum often from a splenic origin.
- Mannkopf's sign:** Increased pulse when the abdomen is palpated creating pain. If a patient is a malingerer there would be no increase in the person's pulse.
- Markle sign or jar tenderness:** Pain is elicited in the right lower quadrant by dropping from standing on the toes to the heels with a jarring landing or tapping the heels of a patient lying on a stretcher. It can indicate a localized peritonitis due to acute appendicitis. It is similar to rebound tenderness, but may be easier to elicit when the patient has firm abdominal wall muscles. Abdominal pain on walking or running is an equivalent sign.

- Murphy's sign:** During inspiration pain is caused while applying pressure to the right upper abdomen which can indicate cholecystitis.
- Obdurator sign:** Flexion and external rotation of the thigh while supine creates hypogastric pain which can indicate a pelvic abscess, inflammatory mass in the pelvis, appendicitis, or diverticulitis.
- Ransohoff sign:** Yellow discoloration of the umbilical region can indicate a ruptured common bile duct.
- Rosenstein's sign:** Increased tenderness in the right lower quadrant when moving from the supine position to a recumbent posture on the left side can indicate acute appendicitis.
- Rovsing's sign:** Pain produced at McBurney's point when compressing the left lower abdomen can indicate acute appendicitis.
- Scaphoid Abdomen:** The abdomen sinks in and appears depressed toward the vertebral column. The area depressed inward is from the costal angle to the ilia. Often caused by malnutrition.
- Scratch test:** If percussion of the liver is difficult, place your stethoscope over the liver and scratch lightly progressing upward. The sound intensifies over the liver.
- Subcutaneous Crepitus:** Small fluctuant nodules felt within skin can indicate gas gangrene or air under skin.
- Ten Horn sign:** Pain caused in the right testicle with gentle traction of the testicle can indicate acute appendicitis.

References:

The references for the above signs were obtained from various sources including the following:

- Adams, G.A., & Bresnick, S.D. (2006). *On Call Surgery* (3rd ed). Philadelphia: W.B. Saunders Co.
- Brunnicardi, F., Andersen, D., Billiar, T., Dunn, D., Hunter, J., & Pollock, R.E. (2004). *Principles of Surgery* (8th ed.). New York: McGraw-Hill, Inc.
- Cope, Z., & Silen, W., (2005). *Cope's diagnosis of the acute abdomen* (21st ed.). New York: Oxford University Press.
- Greenberger, N., Blumberg, R., & Burakoff, R. (2009). *Current Diagnosis and Treatment in Gastroenterology, Hepatology, and Endoscopy*. New York: McGraw-Hill, Inc.
- Heuman, D.M., Mills, A.S., & McGuire, H.H. (1997). *Gastroenterology*. Philadelphia: W.B. Saunders Co.
- Hurt, K.J., Guile, M.W., Bienstock, J.L., Fox, H.E., & Wallach, E.E. (2011). *The John Hopkins Manual of gynecology and obstetrics* (4th ed.). Philadelphia: Lippincott Williams & Wilkins.
- Spirit, M.J. (1998). *Acute care of the abdomen*. Philadelphia: Williams & Wilkins.
- Stone, C.K., & Humphries, R. (2007). *Current Emergency Diagnosis & Treatment* (6th ed.). Norwalk, CT: Appleton & Lange.
- Yeh, E.L. & McNamara, R.M. (2007). Abdominal pain. *Clinics in geriatric medicine*. 23: 255-270.

Special Populations: Points to Remember

	Important Points	Abdominal Pain Causes
<p>Geriatrics (60 & >)</p>	<ul style="list-style-type: none"> • ↓ immune function • Co-morbid conditions <ul style="list-style-type: none"> – DM, malignancy • ↓ physiologic reserve <ul style="list-style-type: none"> – CAD, pulmonary disease • ↑ asymptomatic pathologies • ↓ sensorium <ul style="list-style-type: none"> – Advanced symptoms • Poor historians (?dementia) • Previous surgeries (adhesions) • Abdominal Pain Stats <ul style="list-style-type: none"> – Appendicitis (5%) – Gallstones (10-30%) – Intestinal obstruction (25%) – Perforation: Diverticula (5-10%) – Perforation: PUD (10%) – Rupture of AAA (2%) – Strangulated hernia (20%) 	<ul style="list-style-type: none"> • Biliary tract disease (~ 30-50% >65 yrs have gallstones) <ul style="list-style-type: none"> – 25% have no significant pain / 50% have no fever, vomiting or leukocytosis • Appendicitis (initial incorrect dx occurs in 40-50%) <ul style="list-style-type: none"> – Less common (~10% >60% have acute appendicitis) – 20% present with anorexia, fever, RLQ pain & leukocytosis • Diverticulitis (Diverticula present in 50-80% >65) <ul style="list-style-type: none"> – 85% occurs in left colon – Often afebrile, <50% have ↑ WBC, & ~ 25% have guaiac positive stool • Mesenteric Ischemia (< 1% cause of abdominal pain) <ul style="list-style-type: none"> – Mortality ranges 70-90% with delay of diagnosis – Recurrent postprandial abdominal pain (intestinal angina) – Severe abdominal pain (without tenderness to palpation) & vomiting / diarrhea – Risk factors: Atrial Fibrillation, atherosclerotic disease, ↓ ejection fraction • Bowel Obstruction (Accounts for 12% of abdominal pain) <ul style="list-style-type: none"> – Distention of the colon > 9cm may cause perforation <ul style="list-style-type: none"> • Inguinal hernias most common cause of bowel obstruction • Large bowel volvulus (15%) • Small bowel obstruction 2° adhesions – Risk factors: inactivity & laxative use – Malignancies (Colon CA): 30% men & 40% women • AAA (30% of AAA patients misdiagnosed initially) <ul style="list-style-type: none"> – Patients come in with S&S of renal colic or MS back pain – Dx in stable patient – mortality 25%; Dx in shock patient – mortality 80% • Peptic Ulcer Disease (Users of NSAID's are 5-10 times more likely to develop PUD) <ul style="list-style-type: none"> – ~ 35% of patients have no pain; most common presenting symptom is melena – Perforation is often painless & free air on KUB / CXR is absent in > 60% of patients <ul style="list-style-type: none"> • 35-40% will have rigid, board-like abdomen (with or without shock) • Gastroenteritis (2/3rd of all deaths in those >70 occur from gastroenteritis) <ul style="list-style-type: none"> – Diagnosis of exclusion in patients with vomiting & diarrhea
<p>Pediatrics</p>	<ul style="list-style-type: none"> • Most common reason to bring child to ER • Infants / Young children (S&S) <ul style="list-style-type: none"> – Crying, facial expressions, curling up • Toddlers <ul style="list-style-type: none"> – Talk about their pain • Adolescents <ul style="list-style-type: none"> – May be reluctant to talk about pain • Symptoms (clues): <ul style="list-style-type: none"> – Duration of pain (simple cause <24hr) – Location of pain <ul style="list-style-type: none"> • Simple = periumbilical • Concern = Away from umbilicus – Appearance of child – Vomiting (>12-24 hrs call HCP) <ul style="list-style-type: none"> • Green / yellow call HCP • Blood / darker color to ER – Diarrhea <ul style="list-style-type: none"> • Often sign of viral cause • Blood in stool call HCP or to ER – Fever <ul style="list-style-type: none"> • May or may not be a problem – Groin pain <ul style="list-style-type: none"> • ? Testicular torsion: to ER – Urination with abdominal pain <ul style="list-style-type: none"> • ? Infection: to HCP or ER – Rash & abdominal pain <ul style="list-style-type: none"> • Contact HCP 	<ul style="list-style-type: none"> • Infections <ul style="list-style-type: none"> – Viral (stomach flu) or bacterial (gastroenteritis) <ul style="list-style-type: none"> • Viral quickly / bacterial may need AB to treat • Food Related <ul style="list-style-type: none"> – Food poisoning, food allergies, excess food ingestion, gas production • Poisoning <ul style="list-style-type: none"> – Soap, lye, medications • Surgical <ul style="list-style-type: none"> – Appendicitis, bowel obstruction • Medical <ul style="list-style-type: none"> – Diabetes, black widow spider bite

Special Populations: Points to Remember

	Important Points	Abdominal Pain Causes
<p>Pregnancy / Gynecologic pain</p>	<ul style="list-style-type: none"> • Pregnant woman & abdominal pain <ul style="list-style-type: none"> – Must evaluate mother & fetus <ul style="list-style-type: none"> • Fetal distress may suggest obstetric etiology (placental abruption, uterine rupture) • Monitor uterine contractions during exam – Physiologic changes of pregnancy <ul style="list-style-type: none"> • N/V, constipation, ↑ urination, pelvic & abdominal discomfort common in normal pregnancy (must differentiate) • Peritoneal signs often absent 2° lifting & stretching of anterior abdominal wall. Uterus can obstruct & inhibit movement of omentum (↓ or no pain) • Differentiation between extrauterine vs. uterine tenderness, examine pt in the right or left decubitus position 	<ul style="list-style-type: none"> • Appendicitis <ul style="list-style-type: none"> – First Trimester: Appendix usually located at McBurney's point – 2nd & 3rd Trimesters: Moved upward & laterally – closer to the gallbladder • Cholecystitis <ul style="list-style-type: none"> – Epigastric / RUQ pain, nausea and/or vomiting of 1-4 days duration – Usually not associated with fatty meals or symptoms found in non-pregnant women – Initial presenting symptom may be labor; 1st trimester symptoms may appear like hyperemesis, while 3rd trimester symptoms may appear as HELLP Syndrome <ul style="list-style-type: none"> • Hemolysis, Elevated Liver enzyme levels & Low Platelet count • Ectopic Pregnancy <ul style="list-style-type: none"> – Symptoms: late menses, abdominal / pelvic pain with cramping, +/- vaginal bleeding, shoulder pain, faintness, painful fetal movements – PE: Abdominal pain minimal to severe; shoulder pain 2° free peritoneal fluid; syncope; vaginal bleeding • Perforated Gastric Ulcer <ul style="list-style-type: none"> – Acute epigastric pain, shoulder pain, vomiting & shock • Pyelitis <ul style="list-style-type: none"> – Common ~ 4th month of pregnancy – Chills, fever (103°F 103°F), usually right CVA & loin pain, frequency & pain with urination; abdominal muscles are not rigid; urine +bacteria • Ovarian Cyst Torsion <ul style="list-style-type: none"> – Abdominal pain, fever, vomiting, & tender hypogastrium; rounded swelling aside of uterus • Fibroid Degeneration <ul style="list-style-type: none"> – Pain at fibroid site, slight fever, nausea and/or vomiting • Uterine Rupture <ul style="list-style-type: none"> – Rare; signs of shock & internal hemorrhage • Peritonitis <ul style="list-style-type: none"> – Hypogastric pain / tenderness, nausea and/or vomiting, bilateral tenderness of uterine fornices, fever (103°F)
<p>Trauma</p>	<ul style="list-style-type: none"> • Injuries may not manifest during initial evaluation • Common causes: MVA, pedestrian accidents, falls, industrial & recreational accidents • Caused by 2 mechanisms: <ul style="list-style-type: none"> – Compression forces <ul style="list-style-type: none"> • Direct blow / external compression against object • Usually causes tears or hematoma to subcapsular region of solid viscera • May deform hollow organs, create internal pressure, with possible rupture – Deceleration forces <ul style="list-style-type: none"> • Usually causes stretching / linear shearing of fixed organs rupturing support structures • AMPLE mnemonic for triage history <ul style="list-style-type: none"> – Allergies – Medications – Past medical history – Last meal / intake – Events leading to ER visit 	<ul style="list-style-type: none"> • Compression Forces <ul style="list-style-type: none"> – Liver & spleen most commonly injured organs – Large & small intestines are also commonly injured • Deceleration Forces <ul style="list-style-type: none"> – Hepatic tear along ligamentum teres – Intimal injuries to renal arteries – Mesenteric tears with thrombosis & splanchnic vessel injuries • Physical Examination: <ul style="list-style-type: none"> – Inspection <ul style="list-style-type: none"> • Note abrasions / ecchymotic areas, injury patterns (seat belt abrasion), respiratory pattern (abdominal breathing ? Spinal cord injury), Bradycardia (? Intra-peritoneal blood), Cullen sign [peri-umbilical ecchymosis] / flank bruising (? Retroperitoneal hemorrhage) – Auscultation <ul style="list-style-type: none"> • Abdominal bruit (? Vascular disease / traumatic AV fistula) – Palpation <ul style="list-style-type: none"> • Note masses, tenderness, deformities • Fullness & doughy consistency: Intra-abdominal hemorrhage • Crepitus: Rib fractures / splenic or hepatic injuries • Pelvic instability: GU injury / pelvic &/or retroperitoneal hematoma • Distention: Gastric dilatation • Involuntary guarding / rigidity: Peritonitis (intra-abdominal hemorrhage)

Medical Causes of Acute Abdominal Pain

Symptoms	Medical Illness	Clues
<ul style="list-style-type: none"> • Epigastric pain / upper abdominal pain, tenderness, vomiting 	Acute coronary syndrome MI / CHF/ Pericarditis	Chest pain, shoulder / neck / jaw pain, left arm pain; EKG / CXR
<ul style="list-style-type: none"> • Attacks of acute abdominal pain 	Acute porphyria	UA – dark red / brown on standing; send for porphyrins No fever, chronic constipation
<ul style="list-style-type: none"> • Abdominal pain: continuous, severe & maximal in epigastrium • Anorexia, N/V, high fever 	Adrenal Insufficiency	Soft, non-tender abdomen ↓ sodium, ↓ hydrocortisone levels, ↑ potassium Pigmentation changes / vitiligo Steroid resolve abdominal pain
<ul style="list-style-type: none"> • Generalized abdominal pain – diffuse, severe, crampy • Abdomen with severe rigidity 	Arachnidism	Spider bite (Black Widow): red spot, swelling, urticaria at bite site Outhouse, wood/junk pile, or cluttered basement Separate muscle pains in legs, chest & back
<ul style="list-style-type: none"> • Severe abdominal pain & vomiting • Abdomen may be rigid & tender 	Diabetic coma	UA for glucose, ketones
<ul style="list-style-type: none"> • Abdominal pain, recurrent fever, polyserositis 	Familial Mediterranean Fever	HA precedes pain attack Inherited disease (check family hx) Pain diffuse & may last 6-72 hrs N/V, unilateral chest pain, arthralgias & myalgias common CXR = pleural effusion KUB = signs of peritonitis
<ul style="list-style-type: none"> • Abdominal pain, vomiting, diarrhea, syncope 	Food poisoning	Symptoms start shortly after eating
<ul style="list-style-type: none"> • Acute abdominal pain, N&V, fever with tender abdomen 	Hemolytic crises	CBC
<ul style="list-style-type: none"> • Abdominal wall pain localized / segmented, pain boring & knife-like 	Herpes Zoster	With or without dermatomal rash Serum HSV IgG (PCR analysis)
<ul style="list-style-type: none"> • Abdominal pain (may be severe / colicky) & with vomiting • Malaise > fever 	Influenza	Review of history for general symptoms of influenza
<ul style="list-style-type: none"> • Abdominal tenderness, rigidity, dullness in left hypochondrium 	Leukemia	Irregular fever, anemic appearance Leukocyte count
<ul style="list-style-type: none"> • Abdominal pain localized and steady, burning, accentuated by prolonged standing or sitting in one position 	Nerve root pain	MRI / CT scan spine at level of pain
<ul style="list-style-type: none"> • Abdominal pain with rigidity 	Osteomyelitis	Tenderness over spine MRI / CT of spine
<ul style="list-style-type: none"> • Abdominal pain, N/V 	Periarteritis Nodosa	Symptoms also include: fever, malaise, loss of weight, cardiac symptoms
<ul style="list-style-type: none"> • Severe attacks of abdominal pain with vomiting / diarrhea 	Pernicious anemia	CBC
<ul style="list-style-type: none"> • Abdominal pain, rigidity with possible vomiting 	Pleurisy / Pneumonia	Accompanying chest pain CXR / CT of chest
<ul style="list-style-type: none"> • Vague abdominal pain, distention, free fluid 	Tuberculous peritonitis	Gradual onset of symptoms, no rigidity/tenderness, hx of TB; + PPD
<ul style="list-style-type: none"> • Abdominal distention & vomiting simulating intestinal obstruction 	Uremia (Kidney failure)	Flatus after enema HTN Vomiting not feculent

Abdominal Pain Differential Diagnosis by S&S / Diagnostic Data

Differential DX	Major Signs & Symptoms	Possible Diagnostic Clues	Labs	Radiology
AAA, Acute	<ul style="list-style-type: none"> • Often asymptomatic and/or sensation of pulse or mass in abdomen • Sudden onset of severe tearing pain (may radiate to back, flank, or groin) • Syncope / collapse • Severe: Frank Shock <ul style="list-style-type: none"> - Cyanosis & mottling of LE's - Altered mental status - Tachycardia & Hypotension 	<ul style="list-style-type: none"> • Triad of: <ol style="list-style-type: none"> 1. Hypotension 2. Pulsatile abdominal mass 3. Abdominal Pain • ↓ LE pulses • Imminent rupture: <ul style="list-style-type: none"> - Abdominal / back pain - Vomiting / Syncope - Claudication - Pallor / sweating 	<ul style="list-style-type: none"> • Abdominal mass with aortic pulse • Hx of PVD / COPD / HTN (smoking) • LE mottling / pulseless (blue toe syndrome) • Abdominal girth ≥ 100 cm • Previous MI / current angina • Renal disease 	<ul style="list-style-type: none"> • Ultrasound (screening tool) • CT Scan (pre-op) • MRI / MRA (dye allergy) • Aortography
Appendicitis, Acute	<ul style="list-style-type: none"> • Vague epigastric / periumbilical pain migrating to severe RLQ pain • Nausea (61-92%) Vomiting (50%) • Slight temp (one degree elevation) • Diarrhea / constipation (61-92%) 	<ul style="list-style-type: none"> • Classical presentation: <ul style="list-style-type: none"> - RLQ pain - Nausea / vomiting - Low-grade fever - Tachycardia - Guarding 	<ul style="list-style-type: none"> • Psoas • Obturator • Rovsing's • Cutaneous hyperesthesia • Rectal exam pain due to pelvic appendix 	<ul style="list-style-type: none"> • KUB • Ultrasound • CT scan (GS*)
Cholecystitis Acute	<ul style="list-style-type: none"> • Acute, sudden epigastric / RUQ pain radiating to shoulder or back • N/V • Elevated temp (32%) • RUQ fullness on palpation (20%) 	<ul style="list-style-type: none"> • Recurrent pain attacks following meals (1-6 hrs) • Biliary colic: crescendo pain 	<ul style="list-style-type: none"> • Leukocytosis (~12-15,000) • Slight ↑ ALT / AST • Slight ↑ Amylase with gangrene 	<ul style="list-style-type: none"> • US (GS*) (90-95% sensitive) • CT (GS*) for dilated CBD • Tc HIDA (GS*) during acute pain)(94% sensitive) • ERCP (CBD stones)
Diverticulitis, Acute	<ul style="list-style-type: none"> • LLQ pain (but may occur in RLQ) <ul style="list-style-type: none"> - severe, abrupt in onset - worsens over time - worse after eating - relief with BM / flatus 	<ul style="list-style-type: none"> • ↓ bowel sounds • Palpable mass LLQ • Constipation / Diarrhea • Fever & chills • Anorexia, N/V 	<ul style="list-style-type: none"> • Rebound tenderness LLQ • Rectal exam pain 	<ul style="list-style-type: none"> • CBC Leukocytosis • ESR • UA: WBC's, RBC's if fistula present • LFT's / Electrolytes (rule outs)
Ischemia, Acute Mesenteric	<ul style="list-style-type: none"> • Acute periumbilical pain not proportional to physical findings • Pain initially of visceral nature • If embolus, pain is sudden • Pain with eating (abd angina) 	<ul style="list-style-type: none"> • Absent bowel sounds in region • N/V frequent • Diarrhea • Advanced M.I. <ul style="list-style-type: none"> - Increased abd distention - Ileus - Frank peritonitis - Shock 	<ul style="list-style-type: none"> • Sine qua non of MI – nl abd exam with severe abd pain • Abdominal bruits 	<ul style="list-style-type: none"> • KUB (usually normal) • Angiography (GS*) • CT Scan of abdomen/pelvis

Abdominal Pain Differential Diagnosis by S&S / Diagnostic Data

Differential DX	Common Pain Sites		Possible Diagnostic Clues	Labs	Radiology
Obstruction, Small Bowel	Major Signs & Symptoms		<ul style="list-style-type: none"> Hyperactive BS (early) Hypoactive BS (late) Fever (>100 degrees F) Tachycardia (>100 beats/min) Peritoneal signs Occult blood in stool (strangulation / malignancy) 	<ul style="list-style-type: none"> SMAC 6 (? ↑) ↑ BUN (dehydration) ↑ Creatinine (dehydration) CBC: Mild leukocytosis 	<ul style="list-style-type: none"> KUB (flat/upright) GS* <ul style="list-style-type: none"> Dilated bowel loops Absent / minimal bowel gas CT Scan abd GS* <ul style="list-style-type: none"> If fever, tachycardia, pain, leukocytosis US (may exclude SBO)
	<ul style="list-style-type: none"> Pain crampy & intermittent <ul style="list-style-type: none"> short / colicky w bilious vomiting (proximal obstruction) progressive / abd distention (distal obstruction) Diarrhea (early) Constipation (late) 	<ul style="list-style-type: none"> Nausea / Vomiting <ul style="list-style-type: none"> Bilious / fecal Fever / Tachycardia (? Strangulation) 			
Pancreatitis, Acute	<ul style="list-style-type: none"> Sudden onset of epigastric pain radiating to back & flanks Pain constant & boring Nausea / Vomiting (75-90%) 	<ul style="list-style-type: none"> Distended abdomen Symptoms occur after heavy meal or binge of ETOH Steatorrhea 	<ul style="list-style-type: none"> Tenderness with palpation Pain worse in supine position & lessened in sitting / fetal position 	<ul style="list-style-type: none"> ↑ Amylase / Lipase Hyperglycemia Hypocalcemia CBC – Leukocytosis 	<ul style="list-style-type: none"> KUB (Ileus) CXR (pleural effusion) US/CT/MRI abdomen ERCP
Perforation, Acute Intestinal (Gastric, Duodenal, Intestine)	<ul style="list-style-type: none"> Peptic Ulcer Perforation: <ul style="list-style-type: none"> Sharp, severe, sudden-onset epigastric pain Shoulder pain Hiccup late symptom Appendix Perforation <ul style="list-style-type: none"> Illness of several hours Pain localized to RLQ Pain before vomiting by 3-4 hrs 	<ul style="list-style-type: none"> Peritonitis: <ul style="list-style-type: none"> Tachycardia Fever Generalized abd tenderness Tenderness with percussion Intra-abdominal Hemorrhage <ul style="list-style-type: none"> Abdominal fullness Doughy consistency 	<ul style="list-style-type: none"> Breathing patterns <ul style="list-style-type: none"> Note abdominal movements Examine abdomen for signs of injury, abrasion, ecchymosis Lying immobile with knees flexed, board-like abdomen 	<ul style="list-style-type: none"> CBC with leukocytosis ↑ RBC volume (bleed) LFT's / BUN/Creatinine 	<ul style="list-style-type: none"> Erect CXR's Supine / Erect KUB US of abdomen CT of abdomen Peritoneal tap
Pregnancy, Ectopic	<ul style="list-style-type: none"> Tubal: <ul style="list-style-type: none"> Abdominal tenderness, pelvic &/or shoulder pain, syncope, tenesmus, irregular vag bleed Ovarian: <ul style="list-style-type: none"> Abdominal pain & cramps, pelvic mass, vag bleeding 	<ul style="list-style-type: none"> Abdominal: <ul style="list-style-type: none"> GI symptoms, fetal mvmts marked/painful, palpation of fetal parts Cervical: <ul style="list-style-type: none"> Enlarged cervix, dark tissue seen through external os continuous vag bleeding 	<ul style="list-style-type: none"> Amenorrhea followed by vaginal bleeding <ul style="list-style-type: none"> continuous intermittent irregular 	<ul style="list-style-type: none"> β-HCG (serial quant) CBC (blood loss) Serum progesterone Urine pregnancy test 	<ul style="list-style-type: none"> US vaginal / abd / pelvic CT scan MRI Endovaginal color Doppler flow imaging
Splenic Rupture	<ul style="list-style-type: none"> Presentation highly variable <ul style="list-style-type: none"> LUQ tenderness Left shoulder pain Diffuse abdominal pain with free intraperitoneal blood 	<ul style="list-style-type: none"> Shock <ul style="list-style-type: none"> Tachycardia, tachypnea, restlessness, anxiety Pallor 	<ul style="list-style-type: none"> Hypotension is a grave sign Abdominal trauma 	<ul style="list-style-type: none"> CBC as baseline only 	<ul style="list-style-type: none"> FAST (focused abd sonographic technique) CT Scan Angiography