# Evaluation and Management of Acute Abdominal Pain in Primary Care

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#### **Objectives**

- Discuss the symptoms of acute abdominal pain in relationship to the patient's history and clinical presentation.
- Review the etiology of acute abdominal pain in relationship to anatomic location and the patient's age.
- Review diagnostic testing to evaluate acute abdominal pain and discuss appropriate treatment plans.

#### **Epidemiology**

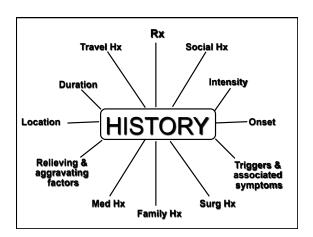
- Abdominal Pain (AP) is a common reason for patients to seek primary care.
- Acute AP is defined in terms of symptoms lasting <1 wk.</p>
- Admission rates for patients with acute AP range from 20-40% (and even higher in the elderly population).
- The diagnosis is undetermined in at least 50% of patients at the time of discharge.
- Initial diagnosis is accurate in only 50-65% of cases.

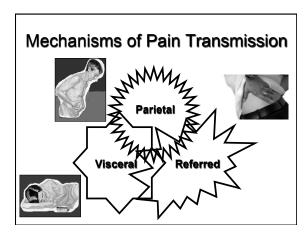
#### **Abdominal Pain**



#### ■ Differential very broad

- Work-up based on symptoms, medical histophysical exam, lab, and location (RUQ, RLQ, LUQ, LLQ, Epigastric, Flank)
- Determine which patients can be safely observed or treated symptomatically and which require further investigation and/or referral





#### **Parietal Pain**

- Caused by stimuli to nociceptors in parietal peritoneum/abdominal wall
- Sharp, discrete pain which is worsened by coughing, moving, sudden jolts
  - Patient lies still, scared to move



#### Visceral Pain

Caused by irritation of pain receptors in abdomen by mechanical and chemical stimuli

- Mechanical: distention, contraction, compression, torsion
- Chernical: serotonin, bradykinin, prostaglandins released in response to inflammation or ischemia
- Autonomic symptoms frequently present (N&V, sweating, pallor)
- Dull, colicky pain that is poorly localized
- Patient is restless, can't get comfortable

#### Referred Pain

- Pain is felt at a site away from the pathological organ
- Pain is usually located in the cutaneous dermatomes sharing the same spinal cord level as the visceral inputs,
  - spinal cord at T5 to T10. Thus, pain from an inflamed gallbladder may be perceived in the right scapula area.

# Patterns of referred abdominal pain Pain from abdominal viscera often (but not always) localizes according to the structure's embryologic origin, with foregut structures (mouth to proximal half of duodenum) presenting with upper abdominal pain, indigut structures (stath half of the painternation of the painternation of the painternation of the painternation of half optimized the painternation of the painternation of the painternation of presenting with lower abdominal paint, hadation of pain may provide niaght into the diagnosis. As examples, pain from pancreatitis may radiate to the back while pain from gallbladder disease may radiate to the right shoulder or subscapular region.

#### FIRST - ASSESS

- ☐ Patient's overall demeanor
- □Skin/Eyes for jaundice
- □Vital Signs
- □Expose the entire abdomen
  - Xiphoid to pubis
- Observe for pulsations
- Description of abdomen
  - ScaphoidFlat

  - Rounded



#### **SECOND - AUSCULTATE**

- Auscultate in all quadrants
- Quantitative

  - Absent
  - DecreasedHyperactive
- Qualitative
  - Normal
  - High-pitched
- Additional Arterial bruits



#### THIRD - PALPATE

- Observe nonverbal signs as you palpate

  - Begin in quadrant opposite the suspected pathology
- Palpate Softly at first
  - Then Deeper

    RUQ note liver edge
    Rebound tenderness



#### **FOURTH - PERCUSS**

- Abdomen

  - Tympany over air ≈ bowel obstruction
     Dullness over organs and fluid (ascites or blood)
- Liver Span
- Bladder, Uterus
  - Rising out of the pelvis

Percussion is very sensitive peritoneal sign



#### Adjuvant Exams

- Lung Exam (basilar pneumonia)
- Cardiac Exam
- **CVA Tenderness**
- Digital Rectal Exam
- Pelvic Exam

### Peritoneal Signs of the Acute Abdomen

- Constant tenderness and guarding
- Involuntary rigidity of abdominal muscles
- Reduced or absent bowel sounds
- Positive Heel-Jar test stand on toes/fall on heels; hop (Markle sign)
- Rebound tenderness -worsens on release of hand after deep palpation (McBurney sign)
- Referred pain deep palpation of LLQ causes pain in RLQ (Rovsing sign)

## Classification of Acute Abdominal Pain

- Three main categories of acute abdominal pain:
  - 1. Intra-abdominal (arising from within the abdominal cavity/retroperitoneum):
    - ■GI (Biliary Tract Disease, Appendicitis, Diverticulitis, Pancreatitis, SBO, IBS, Constipation, Intussusception)
    - ■GU (Renal Colic, Acute urinary retention, UTI)
    - ■Gyn (Acute PID, Ectopic pregnancy)
    - Vascular systems (AAA, Mesenteric Ischemia, Ischemic Colitis)

#### Classification of Abdominal Pain

- 2. Extra-abdominal (less common):
  - Cardiopulmonary (AMI, etc)
  - ■Abdominal wall (Hernia, Zoster etc.)
  - ■Toxic-metabolic (DKA, OD, lead, etc)
  - ■Neurogenic pain (Zoster, etc)
  - ■Psychic (Anxiety, Depression, etc)
- 3. Nonspecific abdominal pain (NSAP) not well explained or described.

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Right upper quadrant	Left upper quadrant
Hepatitis	Splenic abscess
Cholecystitis	Splenic infanct
Cholangitis	Gastritis
Biliary colic	Gastric ulcer
Pancreatitis	Pancreatitis
Budd-Chiari syndrome	Left lower quadrant
Pneumonia/empyema pleurisy	Diverticultis
Subdiaphragmatic abscess	Salpingitis
Right lower quadrant	Ectopic pregnancy
Appendicitis	Inquinal hernia
Salpingitis	Nephrolithiasis
Ectopic pregnancy	Irritable bowel syndrome
Inguinal hernia	Inflammatory bowel disease
Nephrolithiasis	Diffuse
Inflammatory bowel disease	Gastroenteritis
Mesenteric adenitis (yersina)	Mesenteric ischemia
Epigastric	Metabolic (eg. DKA, porphyria)
Peptic ulcer disease	Malaria
Gastroesophageal reflux disease	Familial Mediterranean fever
Gastritis	Bowel obstruction
Pancreatitis	Peritonitis
Myocardial infarction	Irritable bowel syndrome
Pericarditis	
Ruptured aortic aneurysm	
Periumbilical	
Early appendicitis	
Gastroenteritis	
Bowel obstruction	
Rustured aortic aneurysm	

	Causes by Age
Infants	
Constipation     Colic     Intussusception	
Childhood	
Adolescence	
<ul> <li>Appendicitis</li> </ul>	
Adults/Elders:	

# Diagnostic Approach Essential Questions: Stable or Unstable? Vital Signs Is surgical referral needed? Peritonitis Vascular Or is watchful waiting okay?

#### **Diagnostic Approach**

- What are the differential diagnoses?
  - Based on history and physical exam, and possibly labs
- Work up in stable, less obvious cases may include:

  - CBC with differential
     Electrolytes, BUN, creatinine, and glucose
  - Amylase, lipase
  - Bilirubin
  - LFTs UA

  - Pregnancy test in women of childbearing potential
  - Imaging

#### **Diagnostic Approach**

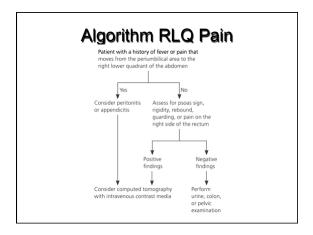
- Primary Imaging for Acute Abdominal Pain:
  - Radiographs Abdomen (and possibly chest)
     Free air (perforation), bowel obstruction, masses

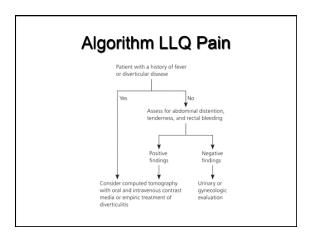
  - US Abdomen (and possibly pelvis)
     Us Stones (GB, CBD), masses, enlarged organizations.

  - CT Abdomen (and possibly pelvis)
     Better at identifying site and cause of obstruction, can identify complications such as ischemia, perforation

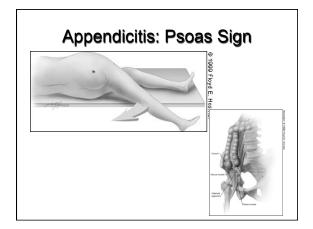
# Algorithm RUQ Pain

Reference: Cartwright, S.L., & Knudson, M.P. (2008). Evaluation of acute abdominal pain in adults. *American Family Physician*, (77)7, 971-978.

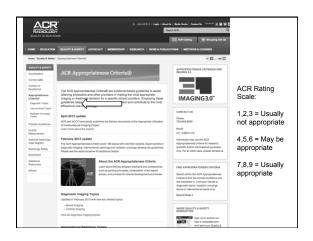




# Acute Appendicitis Clinical features with some predictive value include: Pain located in the RLQ (74%) Pain migration from the periumbilical area to the RLQ (54%) Positive psoas or obturator sign (52%) Fever (51%) Rebound tenderness (40%) Rigidity (38%) Anorexia (26%)

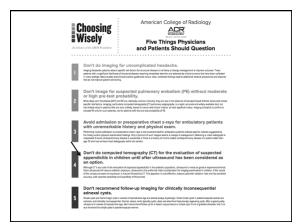


# Passively flex right hip and knee then internally rotate the hip



#### **Acute Appendicitis**

- Ultrasound abdomen is usually used for detection (ACR Rating 9)
- CT abdomen may be ordered in adults and non-pregnant women (ACR Rating 6).
- Ultrasound preferred in children.



#### **Biliary Tract Disease**

- Most common diagnosis of pts > 50 years.
- Generally associated with RUQ pain
  - Composed of:
    - ■Acute Cholecystitis (acalculus/calculus)
    - ■Biliary Colic
    - ■Common Bile Duct Obstruction
- Of those patients found to have acute cholecystitis, the majority lack fever and 40% lack leukocytosis.
- Abdominal US is the test of choice for patients with suspected biliary tract disease (ACR Rating 9), as compared to CT scan with contrast (ACR Rating 6).

#### **Bowel Obstruction**

YCan be either large or small bowel

ÿMost common causes:

Ÿ Adhesions from prior surgery, incarcerated hernia, cancer, volvulus, mass of parasites, inflammatory bowel disease

ŸCT abdomen and pelvis with IV contrast (ACR Rating 9); x-ray abdomen and pelvis (ACR Rating

#### **Acute Pancreatitis**

- 80% of cases are due to ETOH abuse or gallstones in CBD.
- Other common causes:
  - Drugs (Valproic acid, Tetracycline, Hydrochlorothiazide, Furosemide)
     Pancreatic cancer
     Abdominal trauma/surgery

  - Ulcer with pancreatic involvement
  - Familial pancreatitis (Hypertriglycerides / Hypercalcemia)

#### ■ Definition :

Inflammation of the pancreas associated with edema, pancrea autodigestion, necrosis and possible hemorrhage

#### **Acute Pancreatitis**

- Only a minority number of pts present with pain and tenderness limited to the anatomic area of the pancreas in the upper half of the abdomen.
- 50% of pts present with c/o pain extending well beyond the upper abdomen to cause generalized tenderness.

#### **Acute Pancreatitis**

- The inflammatory process around the pancreas may cause other signs and symptoms such as:
  - Pleural effusion
  - Grey Turner's sign (flank discoloration)
  - Cullen's sign ( discoloration around the umbilicus)
  - Ascites
  - Jaundice

0 hours	
Age	>55
White blood cell count	>16,000/mm3
Blood glucose	>200 mg/dL (11.1 mmol/L)
Lactate dehydrogenase	>350 U/L
Aspartate aminotransferase (AST)	>250 U/L
48 hours	
Hematocrit	Fall by ≥10 percent

Ranson criteria to predict severity of acute

Fluid sequestation >6000 mL

The presence of 1 to 3 criteria represents mild pancreatitis; the mortality rate rises significantly with four or more criteria. Adapted from Ranson, HC, Rifnind, RM, Roses, DF, et al, Surg Gynecol Ostet 1974; 139:69.

<8 mg/dL (2 mmol/L)

<60 mmHg

UpToDate°

#### **Acute Pancreatitis**

#### Radiological study:

Ultrasound abdomen – Indicated if increased amylase and lipase with high clinical certainty of diagnosis; with < 48-72 hours after onset of symptoms; Commonly ordered to evaluate for CBD obstruction. (ACR Rating 9)

CT abdomen with contrast – Indicated with high index of severity score and > 48-72 hours after onset of symptoms

(ACR Appropriateness Criteria)

pO2

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#### **Acute Diverticulitis**

- 1/3 of pts present with pain to the lower half of the abdomen.
- 20% of elderly pts with operatively confirmed diverticulitis lacked abdominal tenderness.
- Elderly pts are at risk for a severe and often fatal complication of diverticulitis (perforation of the colon)

#### **Diverticulitis**

- CT abdomen and pelvis with contrast to confirm diagnosis, determine extent of disease and evaluate for complications: perforation, abscess, fistulas, or bowel obstruction
  - Perforated colon CA can mimic acute diverticulitis


#### **Renal Colic**

- Pts may present with abrupt, colicky, unilateral flank pain that radiates to the groin, testicle, or labia.
- Hematuria and plain abd films can be helpful however do not provide a strong support in the diagnostic evaluation of suspected renal colic.
- CT (with and without contrast): masses and stones well seen (ACR Rating 9)
- US: Pregnancy, pediatric age group

#### Hematuria

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#### Acute Pelvic Inflammatory Disease

- Patient may complain of pain/tenderness in lower abdomen, adnexa or cervix.
- Most importantly patient may complain of abnormal vaginal discharge (most common finding).
- Fever, palpable mass, ↑WBC have been inconsistently associated with PID.
- The best noninvasive test is transvaginal ultrasound.

#### **Ectopic Pregnancy**

- Symptoms include lower abdominal pain (most common) and vaginal bleeding (maybe the only complaint).
- Female pts (child bearing age) that present with these symptoms automatically get a urine pregnancy test and HCG quantitative level.
- If the pt is pregnant, then order a transvaginal US to evaluate for ectopic pregnancy (ACR Rating 9).
- Clear view of an IUP in 2 perpendicular views essentially excludes an ectopic pregnancy.

#### **Abdominal Aortic Aneurysm**

- Dissections produce chest or upper back pain that often migrates to abdomen as the dissection extends distally.
- AAA rather than dissect, it often enlarges, leaks, and then ruptures.
- Approx. 50% of pts with AAA present with hypotension, abdominal/back pain, and/or pulsatile abd mass. Sxs often similar to renal colic.
- Neither the presence or the absence of femoral pulse or an abdominal bruit are helpful clinically.

#### **Abdominal Aortic Aneurysm**

- Palpation is an important part of physical exam. May be able to detect an enlarged aorta.
- Pt > 50 yrs old presenting with recent onset of abd/ flank/low back pain should have either US abdomen (ACR Rating 9) or CT scan abdomen without contrast (ACR Rating 8) to confirm/exclude AAA from the differential diagnosis.
  - Smoking history significantly increases risk

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### Extrabdominal Diagnoses of Acute Abdominal Pain: Cardiopulmonary

- Pain is usually in upper half of abdomen.
- A chest film should be done to look for pneumonia, pulmonary infarction, pleura effusion, and/or pneumothorax.
- A neg. film plus pleuritic pain could mean PE.
- If epigastric pain is present one should inquire about cardiac history, get an ECG, and consider further cardiac evaluation.

### Extrabdominal Diagnoses of Acute Abdominal Pain: Hernias

- Characterized by a defect through which intraabdominal contents protrude during increases in the intraabdominal pressure
- Several types exist: inguinal, incisional, periumbilical, and femoral (common in female).
- Uncomplicated hernias can be asymptomatic, aching/uncomfortable, and reducible on exam.
- Significant pain could mean strangulation (blood supply is compromised)/incarceration (not reducible).

### Nonspecific Abdominal Pain (NSAP)

- A good portion of patients will have nonspecific abdominal pain.
- Patients may have nausea, midepigastric pain, or RLQ tenderness.
- The lab workup is usually normal.
- WBC may be elevated.
- If NSAP is the working diagnosis, patients must be re-examined in 24 hours.

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#### **Abdominal Pain Clinical Pearls**

- Do not restrict the diagnosis solely by the location of the pain.
   Consider appendicitis in all patients with abdominal pain who have an appendix, especially in patients with the presumed diagnosis of gastreenteritis, PID or UTI.
   Any woman with childbearing potential and abdominal pain has an ectopic pregnancy until her pregnancy test comes back negative.
   Obtain an ECG in patients with cardiac risk factors presenting with abdominal pain.
   Pain almost always precedes vomiting in surgical causes; converse is true for most gastroenteritis and NSAP.
   Acute cholecystitis is the most common surgical emergency in the elderly.
   If the pain of billiary colic lasts more than 6 hours, suspect early cholecystitis.

#### Medical-Legal Risk

#### Successful Lawsuits

- -Fractures and dislocations
- -Foreign bodies in wound
- -Tendon and nerve damage associated with limb lacerations -Fractures
- -Myocardial Infarction
- -Appendicitis
- -Meningitis
- -Subarachnoid hemorrhage
- -Spinal Cord injury
- -Ectopic pregnancy

#### Largest Damage Awards

- -Myocardial Infarction
- -Meningitis
- -Ectopic Pregnancy
- -Tendon and nerve damage associated with limb lacerations
- -Foreign bodies in wounds

