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.
- 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 history, physical 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

HISTORY

- Onset
- Location
- Duration
- Intensity
- Relieving & aggravating factors
- Medication history (Med Hx)
- Family history (Family Hx)
- Surgical history (Surg Hx)
- Social history (Social Hx)
- Travel history (Travel Hx)
- Triggers & associated symptoms
- Mechanisms of Pain Transmission
  - Visceral
  - Parietal
  - Referred
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, tension
- Chemical: 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.
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
- Scaphoid
- Flat
- Rounded

SECOND - AUSCULTATE

- Auscultate in all quadrants
- Quantitative
  - Absent
  - Decreased
  - Hyperactive
- 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, SBBD, IBDD, Constipation, Intussusception)
   - GU (Renal Colic, Acute urinary retention, UTI)
   - Gyn (Acute PID, Ectopic pregnancy)
   - Vascular systems (AAA, Mesenteric Ischemia, Ischemic Colitis)

2. Extra-abdominal (less common):
   - Cardiopulmonary (AMI, etc)
   - Abdominal wall ( Hernia, Zoster, etc)
   - Toxic-metabolic (DKA, OB, head, etc)
   - Neuropathic pain (Radiculitis, etc)
   - Psychiatric (Anxiety, Depression, etc)

3. Nonspecific abdominal pain (NSAP) – not well explained or described.
Acute Abdominal Pain: Common Causes by Age

Infants
• Constipation
• Colic
• Intussusception

Childhood
•

Adolescence
• Appendicitis

Adults/Elders:
• Appendicitis
• Biliary tract disease, bowel obstruction

Diagnostic Approach

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

What are the differential diagnoses?
- Based on history and physical exam, and possibly labs
  Location of pain has strong predictive value

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

Primary Imaging for Acute Abdominal Pain:
- Radiographs Abdomen (and possibly chest)
  Free air (perforation), bowel obstruction, masses
- US Abdomen (and possibly pelvis)
  Stones (GB, CBD), masses, enlarged organs
- CT Abdomen (and possibly pelvis)
  Better at identifying site and cause of obstruction, can identify complications such as ischemia, perforation

Algorithm RUQ Pain

Acute Appendicitis

- Clinical features with some predictive value include:
  - Pain located in the RLQ (74%)
  - Pain migration from the periumbilical area to the RLQ (64%)
  - Positive psoas or obturator sign (52%)
  - Fever (51%)
  - Rebound tenderness (40%)
  - Rigidity (36%)
  - Anorexia (26%)
Appendicitis: Psoas Sign

Appendicitis: Obturator Sign

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

ACR Rating Scale:
1, 2, 3 = Usually not appropriate
4, 5, 6 = May be appropriate
7, 8, 9 = Usually appropriate
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

- Can be either large or small bowel.

- Most common causes:
  - Adhesions from prior surgery, incarcerated hernia, cancer, volvulus, mass of parasites, inflammatory bowel disease.

- CT abdomen and pelvis with IV contrast (ACR Rating 9); x-ray abdomen and pelvis (ACR Rating 5).

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, pancreatic 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

### 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)
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

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 abdomen 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
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, pleural 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.
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 gastroenteritis, 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 biliary 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
- Myocardial infarction
- Appendicitis
- Meningitis
- Subarachnoid hemorrhage
- Spinal Cord injury
- Ectopic pregnancy

**Largest Damage Awards**
- Myocardial Infarction
- Meningitis
- Fractures
- Ectopic Pregnancy
- Tendon and nerve damage associated with limb lacerations
- Foreign bodies in wounds