Evaluation of the adult with abdominal pain

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INTRODUCTION

Abdominal pain can be a challenging complaint for both primary care and specialist clinicians because it is frequently a benign complaint, but it can also herald serious acute pathology.

Clinicians are responsible for trying to determine which patients can be safely observed or treated symptomatically and which require further investigation or specialist referral. This task is complicated by the fact that abdominal pain is often a nonspecific complaint that presents with other symptoms [1].

This topic reviews a diagnostic approach to nontraumatic abdominal pain in adults. The causes of abdominal pain and its pathophysiology, the evaluation of the adult with abdominal pain in the emergency department, and the evaluation of abdominal pain related to trauma is discussed elsewhere. (See "Causes of abdominal pain in adults" and "Evaluation of the adult with abdominal pain in the emergency department" and "Traumatic gastrointestinal injury in the adult patient".)

EVALUATION

Abdominal pain is a common problem. Most patients have a benign and/or self-limited etiology, and the initial goal of evaluation is to identify those patients with a serious etiology that may require urgent intervention. A history and focused physical examination will lead to a differential diagnosis of abdominal pain, which will then inform further evaluation with laboratory evaluation and/or imaging.

History — The history of a patient with abdominal pain includes determining whether the pain is acute or chronic and a detailed description of the pain and associated symptoms, which should be interpreted with other aspects of the medical history.

The overall sensitivity and specificity of the history and physical examination in diagnosing the different causes of abdominal pain is poor [2], particularly for benign conditions [3,4]. Fortunately, studies of the accuracy of history and physical examination for the more serious causes of abdominal pain (eg, acute appendicitis), alone or in combination with focused investigations, have yielded better results [5-7].

Acute versus chronic — There is no strict time period that will classify the differential diagnosis unfailingly. A clinical judgment must be made that considers whether this is an accelerating process, one that has reached a plateau, or one that is longstanding but intermittent. Patients with chronic abdominal pain may present with an acute exacerbation of a chronic problem or a new and unrelated problem.

Pain of less than a few days' duration that has worsened progressively until the time of presentation is clearly "acute." Pain that has remained unchanged for months or years can be safely classified as chronic. Pain that does not clearly fit either category might be called subacute and requires consideration of a broader differential than acute and chronic pain.

Description — Pain should be characterized according to location, chronology, severity, aggravating and alleviating factors, and associated symptoms. It is also important to note if the patient has recurring episodes of similar pain as this may narrow the differential.

- **Location and radiation** – The location of abdominal pain helps narrow the differential diagnosis as different pain syndromes typically have characteristic locations (table 1A-D). For example, pain involving the liver or biliary tree is generally located in the right upper quadrant, but it may radiate to the back or epigastrium. Because hepatic pain only results when the capsule of the liver is "stretched," most pain in the right upper quadrant is related to the biliary tree. Pain radiation is also important: the pain of pancreatitis classically bores to the back, while renal colic radiates to the groin.

- **Temporal elements** – The onset, frequency, and duration of the pain are helpful features. The pain of pancreatitis may be gradual and steady, while perforation and resultant peritonitis begins suddenly and is maximal from the onset.

- **Quality** – The quality of the pain includes determining whether the pain is burning or gnawing, as is typical of gastroesophageal reflux and peptic ulcer disease, or colicky, as in the cramping pain of gastroenteritis or intestinal obstruction.

- **Severity** – The severity of the pain generally is related to the severity of the disorder, especially if acute in onset. For example, the pain of biliary or renal colic or acute mesenteric ischemia is of high intensity, while the pain of gastroenteritis is less marked. Age and general health may affect the patient's clinical presentation. A patient taking corticosteroids may have significant masking of pain, and older adult patients often present with less intense pain.

- **Precipitants or palliation** – Determining what precipitates or palliates the pain can help narrow the differential. The pain of chronic mesenteric ischemia usually starts within one hour of eating, while the pain of duodenal ulcers may be relieved by eating and recur several hours after a meal. The pain of pancreatitis is classically relieved by sitting up and leaning forward. Peritonitis often causes patients to lie motionless on their backs because any motion causes pain. Obtaining a history of pain occurring in relationship to eating lactose- or gluten-containing foods may be helpful in identifying sensitivities to these food constituents. Patients with foodborne illness may become ill after eating certain foods (table 2).

Associated symptoms — Symptoms that occur in relation to abdominal pain may give important information.

- **Other gastrointestinal symptoms** – We ask about associated nausea, vomiting, diarrhea, constipation, hematochezia, melena, and changes in stool (eg, change in caliber). For patients with right upper quadrant pain or concern for liver disease, we also ask about jaundice and changes in the color of urine and stool. The bowel habit is an important part of the history for chronic abdominal pain. While many organic lesions can result in chronic diarrhea, irritable bowel syndrome (IBS) often presents with swings between diarrhea and constipation, a pattern that is much less likely with organic disease.

- **Genitourinary symptoms** – Patients with symptoms such as dysuria, frequency, and hematuria are more likely to have a genitourinary cause for their abdominal pain.

- **Constitutional symptoms** – Symptoms such as fevers, chills, fatigue, weight loss, and anorexia would be concerning for infection, malignancy, or systemic illnesses (eg, inflammatory bowel disease [IBD]).

- **Cardiopulmonary symptoms** – Symptoms such as cough, shortness of breath, orthopnea, and exertional dyspnea suggest a pulmonary or cardiac etiology. Orthostatic hypotension may indicate early shock or be associated with adrenal insufficiency.

- **Other** – Patients with diabetic ketoacidosis will have symptoms of polyuria and thirst. Patients with suspected IBD should be asked about extraintestinal manifestations (table 3).

Other medical history — Other aspects of the history help narrow the differential.

- **Specific questions for women** – Women should be screened for sexually transmitted diseases and risks for pelvic inflammatory disease (eg, new or multiple partners). (See "Screening for sexually transmitted infections", section on 'Assessing risk'.)

  Premenopausal women should be asked about their menstrual history (last menstrual period, last normal menstrual period, previous menstrual period, cycle length) and use of contraception. They should also be asked about vaginal discharge or bleeding, dyspareunia or dysmenorrhea, as these symptoms suggest a pelvic pathology. (See "Prenatal care: Initial assessment" and "Evaluation of acute pelvic pain in nonpregnant adult women" and "Evaluation of chronic pelvic pain in females".)

- **Past medical history** – A history of surgeries and procedures should be obtained to assess risk for differing etiologies (eg, a history of abdominal surgery is a risk factor for obstruction). A history of cardiovascular disease (CVD) or multiple risk factors for CVD in a patient with epigastric pain raises concern for a myocardial ischemia. (See "Outpatient evaluation of the adult with chest pain", section on 'Differential Diagnosis'.)

- **Medications** – A comprehensive medication list (including over the counter medications and medications that cause constipation (table 4)) should be elicited as this can inform the differential. For example, patients taking high doses of nonsteroidal antiinflammatory drugs (NSAIDs) are at risk for gastropathy and peptic ulcer disease. Patients with recent antibiotics use or hospitalization are at risk for *Clostridioides* (formerly *Clostridium*) *difficile*. Patients on chronic steroids are at risk for adrenal insufficiency and may be immunosuppressed with atypical presentations of abdominal pain. (See "Peptic ulcer disease: Epidemiology, etiology, and pathogenesis", section on 'NSAIDs, including aspirin' and "Peptic ulcer disease: Clinical manifestations and diagnosis", section on 'Evaluate nonsteroidal anti-inflammatory drug (NSAID) use' and "Clostridioides (formerly Clostridium) difficile infection in adults: Epidemiology, microbiology, and pathophysiology", section on 'Risk factors'.)

- **Other history**

  - **Alcohol** – It is important to ask about alcohol intake to assess for the possibility of liver disease and pancreatitis.

  - **Family history** – Family history should be asked as appropriate based on other history. For example, patients with history concerning for IBD or cancer should also be asked about family history. (See "Definitions, epidemiology, and risk factors for inflammatory bowel disease in adults".)

  - **Travel history** – A travel history is important to elicit in patients with symptoms consistent with gastroenteritis or colitis (eg, nausea, vomiting, and diarrhea) to consider infectious etiologies [8].

- **Sick contacts** – Often patients are in contact with someone with gastroenteritis before having similar symptoms. Patients with foodborne illness may also have close contacts with similar illness.

Physical examination — All patients should have vital signs and an abdominal examination. Other physical examination will depend on the history. Patients with chronic abdominal pain should have a thorough physical examination.

- **Vital signs** – Unstable vital signs are an indication for immediate referral to the emergency department. (See "Evaluation of the adult with abdominal pain in the emergency department".)

  Vital signs may inform further evaluation. Weight and any changes should be noted for patients seen over multiple visits. Patients with hypoxemia should be evaluated for pulmonary etiologies of abdominal pain. Fever raises suspicion for infectious disease. Orthostatic vital signs may be indicative of dehydration or a sign of adrenal insufficiency.

- **Abdominal examination** – The abdominal examination includes inspection, auscultation, percussion, and palpation. In patients with suspected psychogenic abdominal pain, it is important to perform the abdominal examination while the patient is distracted.

  - **Inspection** – The general appearance and level of comfort or discomfort should be noted. Inspection of the abdomen should include attention to the position assumed by the patient when in pain; strict immobility is typical of a patient with peritonitis, while patients with biliary or renal colic writhe in agony. Patients with peritonitis will have worsening pain when the examiner lightly bumps the stretcher.

  - **Auscultation** – The abdomen should be auscultated for bowel sounds. Auscultation is a useful physical finding, particularly in detecting ileus [9,10]. Abnormal bowel sounds are highly predictive of a small bowel obstruction in patients with acute abdominal pain. Abnormally active, high-pitched bowel sounds are a feature of early bowel obstruction, while a friction rub in the appropriate area might be heard in a patient with a splenic infarct.

  - **Percussion** – We start with gentle percussion (rather than palpation). Patients with peritonitis will have pain with gentle percussion. Percussion is also used to identify ascites and hepatomegaly. Tympany signifies a distended bowel, while dullness may signify a mass. Shifting dullness is a reliable and fairly accurate sign for the detection of ascites.

  - **Palpation** – Palpation is used to evaluate tenderness of the abdomen and for enlarged organs (eg, hepatomegaly or splenomegaly) or masses. We start by examining the quadrant of the abdomen where the patient is experiencing the least pain.

    Muscular rigidity or "guarding" is an important and early sign of peritoneal inflammation; it can be unilateral in a patient with a focal inflammatory mass such as a diverticular abscess or diffuse in peritonitis. Guarding is typically absent with deeper sources of pain such as renal colic and pancreatitis.

    Rebound tenderness may reflect peritonitis. If testing for rebound tenderness is appropriate, we begin with gentle palpation and release. If the patient has no rebound tenderness with gentle palpation, we then proceed to deeper palpation and release.

    The patient should be examined for signs of nerve and muscle wall injury and hernia. Pain in a dermatomal distribution and hyperesthesia are both signs of nerve involvement as in herpes zoster or nerve root impingement. Abdominal wall pathology may be found by palpation or by noting exacerbation of the pain when using the abdominal wall muscles (eg, sitting up).

- **Rectal examination** – Most patients with abdominal pain should have a rectal examination. Fecal impaction might be the explanation for signs and symptoms of obstruction in older adults, while tenderness on rectal examination may be the only abnormal finding in a patient with retrocecal appendicitis. However, some patients with localized upper abdominal pain (eg, right upper quadrant pain) or abdominal pain that is likely from a non-gastrointestinal cause (eg, suspected cystitis) may not require a rectal examination.

- **Pelvic examination** – A pelvic examination should be done whenever pelvic pathology is in the differential diagnosis. Unless the patient has another etiology of abdominal pain, all women with acute lower abdominal pain should have a pelvic examination. (See "The gynecologic history and pelvic examination" and "Causes of abdominal pain in adults", section on 'Women'.)

- **Other** – The eyes should be examined for scleral icterus and the skin for jaundice. Patients with pulmonary or cardiac symptoms should have pulmonary and cardiac exams. Patients with history concerning for IBD should be examined for extraintestinal manifestations of IBD (table 3). (See "Auscultation of cardiac murmurs in adults" and "Auscultation of heart sounds".)

Studies — Laboratory studies are determined by the history and physical and will vary depending on the suspected etiology. Pregnancy should be excluded in all women of childbearing age with abdominal pain. (See 'Diagnostic approach to acute abdominal pain' below and 'Diagnostic approach to chronic abdominal pain' below.)

Patients with abdominal pain will often have imaging as part of their evaluation. The imaging modality chosen will depend on suspected etiologies. Imaging modalities that may be used to evaluate abdominal pain include ultrasound, computed tomography (CT) scan, magnetic resonance imaging (MRI; including magnetic resonance cholangiopancreatography), endoscopy, and endoscopic retrograde cholangiopancreatography. (See "Overview

of upper gastrointestinal endoscopy (esophagogastroduodenoscopy)" and "Endoscopic retrograde cholangiopancreatography: Indications, patient preparation, and complications".)

DIAGNOSTIC APPROACH TO ACUTE ABDOMINAL PAIN

The diagnostic approach to acute abdominal pain will depend on whether or not the pain is localized. The location of abdominal pain helps narrow the differential diagnosis as different pain syndromes typically have characteristic locations (table 1A-C, 1E). Some patients with acute abdominal pain will need urgent or emergency evaluation.

Urgent/emergent evaluation and/or surgical abdomen — Patients in whom there are concerns for life-threatening causes of abdominal pain should be referred to the emergency department. (See "Evaluation of the adult with abdominal pain in the emergency department".)

These include those with:

- Unstable vital signs
- Signs of peritonitis on abdominal exam (eg, abdominal rigidity, rebound tenderness, and/or pain that worsens when the examiner lightly bumps the stretcher)
- Concern that the abdominal pain is from a life-threatening condition (eg, acute bowel obstruction, acute mesenteric ischemia, perforation, acute myocardial infarction, ectopic pregnancy)

These patients may require analgesics, which can be administered without compromising their assessment. (See "Evaluation of the adult with abdominal pain in the emergency department", section on 'Analgesia'.)

Patients with concern for infection on initial evaluation (eg, fever, jaundice, and right upper quadrant pain) should also be evaluated promptly, often requiring referral to the emergency department for expedited evaluation. (See "Acute cholangitis: Clinical manifestations, diagnosis, and management".)

Patients with less acute illnesses may require consultation or referral for further management following a more detailed history and initial assessment, as described below.

Nonurgent evaluation — In patients with localized pain, the differential diagnosis can be considered in terms of "symptom clusters" in order to guide further management and investigation. Patients with diffuse abdominal pain may need a broader evaluation.

Right upper quadrant pain — Pain involving the liver or biliary tree is generally located in the right upper quadrant, but it may radiate to the back or epigastrium (table 1C). Because hepatic pain only results when the capsule of the liver is "stretched," most pain in the right upper quadrant is related to the biliary tree. Patients with right upper quadrant pain should have the following laboratory studies:

- Complete blood count with differential
- Electrolytes, blood urea nitrogen (BUN), creatinine, and glucose
- Aminotransferases, alkaline phosphatase, and bilirubin
- Lipase and/or amylase

Patients should also have an abdominal ultrasound to evaluate for hepatobiliary etiologies.

Further evaluation will depend on the results of laboratory studies and ultrasound results. Patients in whom there is concern for hepatobiliary infection, particularly acute cholangitis and acute cholecystitis, should be referred for prompt evaluation. (See "Acute cholangitis: Clinical manifestations, diagnosis, and management" and "Acute calculous cholecystitis: Clinical features and diagnosis".)

Epigastric pain — Patients with epigastric pain and cardiac risk factors and/or other symptoms concerning for angina (eg, shortness of breath, exertional symptoms) should have appropriate cardiac evaluation. (See "Angina pectoris: Chest pain caused by fixed epicardial coronary artery obstruction", section on 'Diagnosis'.)

Other patients with epigastric pain should be evaluated for pancreatitis as well as gastric etiologies (table 1B). Patients should have the following laboratory studies:

- Complete blood count with differential
- Electrolytes, BUN, creatinine, and glucose
- Aminotransferases, alkaline phosphatase, and bilirubin
- Lipase and/or amylase

If there is concern for hepatobiliary pain (table 1C), patients should have an abdominal ultrasound for evaluation. Patients with concern for other etiologies should have appropriate evaluation (eg, if concern for peptic ulcer disease, endoscopy may be indicated). (See "Peptic ulcer disease: Clinical manifestations and diagnosis", section on 'Upper endoscopy'.)

Pain limited to the epigastrium, which may be associated with bloating, abdominal fullness, heartburn, or nausea can be classified as dyspepsia (table 5). The evaluation of dyspepsia is discussed in detail elsewhere. (See "Approach to the adult with dyspepsia", section on 'Initial evaluation'.)

Left upper quadrant pain — Left upper quadrant pain can be caused by splenic etiologies (table 1A). Patients with left upper quadrant pain should therefore be evaluated for splenomegaly and other disorders of the spleen. Most patients will have imaging with either ultrasound or computed tomography (CT) scan.

However, the causes of epigastric abdominal pain are more common than splenic etiologies (table 1B), and pain from these disorders may atypically present as left upper quadrant pain.

The evaluation of patients with splenomegaly is discussed separately. (See "Evaluation of splenomegaly and other splenic disorders in adults", section on 'Evaluation (splenomegaly)'.)

Lower abdominal pain — Pain in the lower abdomen can be associated with the distal intestinal tract, but it may also radiate down from upper abdominal structures or up from the pelvis (table 1E). Diagnostic evaluation will depend on suspected etiologies based on the history and physical examination.

Women of childbearing age should have a pregnancy test. Women with suspected pelvic etiologies (table 6 and table 7) should have appropriate evaluation, which is discussed elsewhere. (See "Evaluation of acute pelvic pain in nonpregnant adult women".)

Patients with suspected genitourinary etiologies should have appropriate evaluation (eg, patients with lower abdominal pain and concern for cystitis or pyelonephritis should have a urinalysis and culture). (See "Acute simple cystitis in women", section on 'Diagnostic approach' and "Acute simple cystitis in men", section on 'Diagnostic approach' and "Acute complicated urinary tract infection (including pyelonephritis) in adults", section on 'Diagnostic approach'.)

Patients thought to have lower abdominal pain from gastrointestinal causes should have a complete blood count with differential. Further diagnostic testing will depend on suspected etiology. As examples:

- Patients with lower abdominal pain and acute diarrhea may have self-limited presentations and can be managed expectantly depending on severity of illness and other risk factors (algorithm 1). This is discussed in detail elsewhere. (See "Approach to the adult with acute diarrhea in resource-rich settings".)
- Subacute right lower quadrant pain with diarrhea is the most characteristic presentation of ileal Crohn disease, although the presentation of inflammatory bowel disease (IBD) can be highly variable. (See "Approach to the adult with chronic diarrhea in resource-rich settings", section on 'Initial evaluation'.)
- Acute left lower quadrant pain with fever and elevated white blood cell count is suggestive of diverticulitis. (See "Clinical manifestations and diagnosis of acute diverticulitis in adults", section on 'Diagnosis'.)
- Patients with anemia should have evaluation for iron deficiency anemia. In older patients, iron deficiency anemia is concerning for colorectal cancer. (See "Causes and diagnosis of iron deficiency and iron deficiency anemia in adults" and "Clinical presentation, diagnosis, and staging of colorectal cancer", section on 'Symptoms from the local tumor'.)
- In older patients, abdominal pain and a change in bowel habits can be the first sign of colon cancer. Presentations of colonic neoplasia are highly variable, so risk factors for colon cancer (particularly age and family history) should be considered in patients with lower abdominal pain. (See "Clinical presentation, diagnosis, and staging of colorectal cancer".)

Diffuse abdominal pain — Patients with diffuse or nonspecific abdominal pain may have pain from etiologies that lead to diffuse abdominal pain (table 8) or those that tend to be more localized (table 1A-C, 1E). Diagnostic evaluation will depend on suspected etiologies based on the history and physical examination.

Patients with suspected acute infectious gastroenteritis or toxin-mediated food poisoning may not need further evaluation. The most useful diagnostic tool will often be watchful waiting for spontaneous recovery. Multisystem symptoms, such as upper respiratory tract involvement or myalgias, may suggest a viral etiology. A history of family members or other contacts developing a similar illness is valuable, not only because it points towards a likely diagnosis, but because the patient's illness is likely to mimic the course of their contact's illness. Depending on their degree of systemic illness, patients with self-limited symptoms may need only reassurance or may require significant supportive care. (See "Acute viral gastroenteritis in adults", section on 'Treatment'.)

Patients with diffuse upper abdominal pain may have pleural or pulmonary pathology, particularly when the patient also had associated pulmonary symptoms (eg, cough, shortness of breath). Lower lobe pulmonary pathologies (eg, pneumonia, pulmonary embolism) or inflammatory pleural effusions (eg, empyema, pulmonary infarction) can present with what appears to be abdominal pain because they occur at the threshold of the abdomen. In patients with diffuse upper abdominal pain and associated pulmonary symptoms, chest imaging should be done to evaluate for thoracic etiologies. The modality will depend on suspected etiology. For example, patients with suspected pneumonia should have chest radiography, while

patients with suspected pulmonary embolism should have a chest CT scan. (See "Diagnostic approach to community-acquired pneumonia in adults", section on 'Radiologic evaluation' and "Overview of acute pulmonary embolism in adults", section on 'Diagnostic approach to patients with suspected PE'.)

In patients with diffuse or nonspecific abdominal pain with unknown etiology, we check the following laboratory studies:

- Electrolytes, with calculation of an anion gap
- BUN, creatinine, blood glucose
- Calcium
- Complete blood count with differential
- Lipase and/or amylase
- Pregnancy test in women of childbearing age
- In older adult or immunosuppressed patients who may have atypical presentations of biliary tree infection, we also check aminotransferases, alkaline phosphatase, and bilirubin

Further evaluation will depend on results from the initial evaluation. As examples:

- Patients with history concerning for IBD with extraintestinal manifestations (table 3) and/or family history should be evaluated as appropriate. (See "Clinical manifestations, diagnosis, and prognosis of ulcerative colitis in adults", section on 'Diagnosis' and "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults", section on 'Diagnostic evaluation'.)

- The combination of metabolic acidosis and an elevated blood glucose strongly suggests diabetic ketoacidosis (DKA) as the etiology of the symptoms. It is important to keep in mind that an intraabdominal infection could precipitate DKA in a patient with diabetes. (See "Diabetic ketoacidosis and hyperosmolar hyperglycemic state in adults: Clinical features, evaluation, and diagnosis".)

- Patients with hyponatremia or hyperkalemia and symptoms of fatigue, malaise, nausea and vomiting, and symptoms of hypotension may have adrenal insufficiency. (See "Clinical manifestations of adrenal insufficiency in adults".)

- Hypercalcemia can cause abdominal pain, either directly or as an etiology for pancreatitis or constipation. (See "Clinical manifestations of hypercalcemia", section on 'Gastrointestinal abnormalities'.)

DIAGNOSTIC APPROACH TO CHRONIC ABDOMINAL PAIN

Chronic abdominal pain is a common complaint, and the vast majority of patients will have a functional disorder, most commonly irritable bowel syndrome (IBS) [11,12]. The evaluation of chronic lower abdominal pain (pelvic pain) in women is discussed separately. (See "Clinical manifestations and diagnosis of irritable bowel syndrome in adults", section on 'Chronic abdominal pain' and "Causes of chronic pelvic pain in nonpregnant women".)

Initial workup — Initial workup is focused on differentiating benign functional illness from organic pathology. Features that suggest organic illness include weight loss, fever, hypovolemia, electrolyte abnormalities, symptoms or signs of gastrointestinal blood loss, anemia, or signs of malnutrition. Laboratory studies should be normal in patients with functional abdominal pain.

The following laboratory measurements should be performed in most patients with chronic abdominal pain:

- Complete blood count with differential
- Electrolytes, blood urea nitrogen (BUN), creatinine, and glucose
- Calcium
- Aminotransferases, alkaline phosphatase, and bilirubin
- Lipase and/or amylase
- Serum iron, total iron binding capacity, and ferritin
- Anti-tissue transglutaminase

Further evaluation with imaging will depend on the differential diagnosis based on the history, physical, and laboratory studies. For example:

- Laboratory studies suggestive of iron deficiency should raise the suspicion of celiac disease, inflammatory bowel disease (IBD), or malignancy (eg, colorectal cancer). (See "Causes and diagnosis of iron deficiency and iron deficiency anemia in adults" and "Clinical manifestations, diagnosis, and prognosis of Crohn disease in adults", section on 'Clinical features' and "Clinical manifestations, diagnosis, and prognosis of ulcerative colitis in adults", section on 'Clinical manifestations' and "Clinical presentation, diagnosis, and staging of colorectal cancer".)

- In patients where IBD remains in the differential diagnosis but index of suspicion is low, fecal calprotectin, which is sensitive for detection of intestinal inflammation, may be used to select patients for colonoscopy. (See "Approach to the adult with chronic diarrhea in resource-rich settings", section on 'General laboratory tests'.)

- A history of recurrent pancreatitis or excessive alcohol intake should raise suspicion for chronic pancreatitis. (See "Chronic pancreatitis: Clinical manifestations and diagnosis in adults".)

- Abdominal pain is not a common presentation of hypothyroidism, but when additional symptoms (table 9) suggest abnormalities of thyroid function, a thyroid-stimulating hormone should be measured. Hypothyroidism can occasionally cause abdominal pain in the setting of constipation and ileus. (See "Diagnosis of and screening for hypothyroidism in nonpregnant adults", section on 'Clinical features'.)

- While the hallmark of IBS is pain associated with changes in bowel habit, other related functional disorders may present with isolated pain (such as functional abdominal pain syndrome) or with pain mimicking upper gastrointestinal organic pathology (such as functional dyspepsia). (See "Clinical manifestations and diagnosis of irritable bowel syndrome in adults" and "Functional dyspepsia in adults".)

Subsequent workup — At the conclusion of the initial workup, young patients with no evidence of organic disease can be treated symptomatically. The use of further invasive testing should be directed at ruling in or out specific diseases and not as a general screen.

However, a diagnosis of new-onset functional illness should be made only with great caution in patients over 50 years of age. These patients, by virtue of their increased risk of malignancy, will likely require abdominal imaging as their symptoms and signs dictate.

Some patients have a history of pain that is likely organic, based on historical features or laboratory abnormalities, but may be difficult to definitively diagnose because the symptoms are intermittent. Less common causes of abdominal pain (table 1D) should be considered in patients with repeated visits for the same complaint without a definite diagnosis, in an ill-appearing patient with minimal or nonspecific findings, in patients with pain out of proportion to clinical findings, and in immunocompromised patients. Examples of such cases include:

- Right upper quadrant pain after cholecystectomy that mimics biliary colic and could be functional biliary pain; it could also arise from intermittent passage of stones that have formed in the bile ducts, passage of sludge, or sphincter of Oddi dysfunction. (See "Clinical manifestations and diagnosis of sphincter of Oddi dysfunction".)

- Chronic, partial small bowel obstruction may occur in some patients. Patients usually present with chronic postprandial abdominal discomfort and variable nausea. Abdominal distention and tympany may be present, but usually without any fluid or electrolyte derangements. (See "Etiologies, clinical manifestations, and diagnosis of mechanical small bowel obstruction in adults", section on 'Chronic partial obstruction'.)

- Very rare causes of intermittent acute severe abdominal pain should be considered in the setting of a positive family history (eg, familial Mediterranean fever, hereditary angioedema, acute intermittent porphyria [AIP]); in the case of AIP, the diagnosis may be considered even without a family history of the disease. (See "Clinical manifestations and diagnosis of familial Mediterranean fever" and "Hereditary angioedema: Epidemiology, clinical manifestations, exacerbating factors, and prognosis" and "Acute intermittent porphyria: Pathogenesis, clinical features, and diagnosis".)

SPECIAL POPULATIONS

Pelvic etiologies of abdominal pain (table 6) should be considered in women. Other populations of patients, including older adults [13], and patients with human immunodeficiency virus (HIV) [14] may present with unusual causes of abdominal pain or may have unusual presentations of common disorders.

Women — Lower abdominal pain in women must be considered as a spectrum with causes of pelvic pain (table 6). The evaluation of pelvic pain in women is discussed separately. (See "Evaluation of acute pelvic pain in nonpregnant adult women" and "Evaluation of chronic pelvic pain in females".)

Acute abdominal pain in pregnant and postpartum women may or may not be related to pregnancy. (See "Approach to acute abdominal pain in pregnant and postpartum women".)

Older adults — Older adult patients often do not present with the same signs and symptoms of disease characteristic of younger individuals. Older patients may not have fever or abnormal laboratory values with infectious etiologies for abdominal pain [15]. The frequency of misdiagnosis of the acute abdomen in older patients is high and associated with higher mortality rates than in younger patients [16].

A particularly high level of suspicion should be maintained for severe pathology in immunosuppressed patients (including those taking immunosuppressive agents or having comorbidities affecting immune function, such as diabetes or renal failure) and older adults, where classic signs of peritoneal inflammation may be attenuated.

Sickle cell — Patients with sickle cell may have right upper quadrant pain in the setting of hepatic involvement. The liver can be affected by a number of complications due to the disease itself and its treatment. (See "Hepatic manifestations of sickle cell disease", section on 'Disorders associated with the sickling process' and "Hepatic manifestations of sickle cell disease", section on 'Disorders related to coexisting conditions'.)

HIV-infected patients — Diagnostic evaluation of abdominal pain in the HIV-infected patient is similar to that in the general population, but it is also

guided by the immunologic function as represented by the CD4 cell count. The differential diagnosis includes common etiologies seen in the general population (eg, appendicitis, diverticulitis) but also opportunistic infections (eg, cytomegalovirus [CMV], *Mycobacterium avium* complex [MAC], cryptosporidium) and neoplasms (eg, Kaposi sarcoma, lymphoma) if there is evidence of advanced immunodeficiency (CD4 cell count <100 cells/microL). In this context, there should be a lower threshold for radiologic imaging and obtaining tissue culture and/or biopsy where appropriate. (See "AIDS-related cytomegalovirus gastrointestinal disease" and "Mycobacterium avium complex (MAC) infections in persons with HIV" and "Cryptosporidiosis: Epidemiology, clinical manifestations, and diagnosis" and "AIDS-related Kaposi sarcoma: Clinical manifestations and diagnosis" and "HIV-related lymphomas: Clinical manifestations and diagnosis".)

Evaluation of odynophagia and dysphagia and diarrhea in the HIV-infected patient are discussed elsewhere. (See "Evaluation of the HIV-infected patient with odynophagia and dysphagia" and "Evaluation of the HIV-infected patient with diarrhea".)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Nontraumatic abdominal pain in adults".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Stomach ache and stomach upset (The Basics)" and "Patient education: Chronic pelvic pain in women (The Basics)" and "Patient education: Upper endoscopy (The Basics)" and "Patient education: Severe abdominal pain (The Basics)")
- Beyond the Basics topics (see "Patient education: Upset stomach (functional dyspepsia) in adults (Beyond the Basics)" and "Patient education: Chronic pelvic pain in women (Beyond the Basics)" and "Patient education: Upper endoscopy (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- Abdominal pain is a common problem. Most patients have a benign and/or self-limited etiology, and the initial goal of evaluation is to identify those patients with a serious etiology for their symptoms that may require urgent intervention. (See 'Evaluation' above.)

  The history of a patient with abdominal pain includes determining whether the pain is acute or chronic and a detailed description of the pain and associated symptoms. (See 'History' above.)

  All patients should have vital signs and an abdominal examination. Other physical examination will depend on the history. Patients with chronic abdominal pain should have a thorough physical examination. (See 'Physical examination' above.)

- Patients with unstable vital signs, signs of peritonitis on abdominal exam, or in whom there are concerns for life-threatening causes of abdominal pain (eg, acute bowel obstruction, acute mesenteric ischemia, perforation, acute myocardial infarction, ectopic pregnancy) should be referred to the emergency department. Patients with concern for infection on initial evaluation (eg, fever, jaundice, and right upper quadrant pain) should also be evaluated promptly, often requiring referral to the emergency department for expedited evaluation. (See 'Urgent/emergent evaluation and/or surgical abdomen' above.)

- In patients with acute localized abdominal pain, the differential diagnosis can be considered in terms of "symptom clusters" (table 1A-C, 1E) in order to guide further management and investigation. Patients with diffuse or nonspecific abdominal pain may have pain from etiologies that lead to diffuse abdominal pain (table 8) or those that tend to be more localized. Pelvic etiologies of abdominal pain (table 6) should be considered in women with lower abdominal pain. (See 'Nonurgent evaluation' above and 'Women' above.)

- Most patients with chronic abdominal pain have a benign functional disorder such as irritable bowel syndrome (IBS) or functional dyspepsia. Initial workup is focused on differentiating benign functional illness from organic pathology. (See 'Initial workup' above.)

  At the conclusion of the initial workup, young patients with no evidence of organic disease can be treated symptomatically. However, a diagnosis of new-onset functional illness should be made only with great caution in patients over 50 years of age. These patients, by virtue of their

increased risk of malignancy, will likely require abdominal imaging as their symptoms and signs dictate. (See 'Subsequent workup' above.)

- Specific populations of patients, including older adults and patients with human immunodeficiency virus (HIV) may present with unusual causes of abdominal pain or may have unusual presentations of common disorders. (See "Evaluation of acute pelvic pain in nonpregnant adult women" and "Evaluation of chronic pelvic pain in females" and 'Special populations' above.)

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Topic 6862 Version 54.0

GRAPHICS

Causes of left upper quadrant (LUQ) abdominal pain

LUQ	Clinical features	Comments
Splenomegaly	Pain or discomfort in LUQ, left shoulder pain, and/or early satiety.	Multiple etiologies.
Splenic infarct	Severe LUQ pain.	Atypical presentations common. Associated with a variety of underlying conditions (eg, hypercoagulable state, atrial fibrillation, and splenomegaly).
Splenic abscess	Associated with fever and LUQ tenderness.	Uncommon. May also be associated with splenic infarction.
Splenic rupture	May complain of LUQ, left chest wall, or left shoulder pain that is worse with inspiration.	Most often associated with trauma.

Graphic 106201 Version 2.0

Causes of epigastric abdominal pain

Epigastric	Clinical features	Comments
Acute myocardial infarction	May be associated with shortness of breath and exertional symptoms.	Consider particularly in patients with risk factors for coronary artery disease.
Acute pancreatitis	Acute-onset, persistent upper abdominal pain radiating to the back.	
Chronic pancreatitis	Epigastric pain radiating to the back.	Associated with pancreatic insufficiency.
Peptic ulcer disease	Epigastric pain or discomfort is the most prominent symptom.	Occasionally, discomfort localizes to one side.
Gastroesophageal reflux disease	Associated with heartburn, regurgitation, and dysphagia.	
Gastritis/gastropathy	Abdominal discomfort/pain, heartburn, nausea, vomiting, and hematemesis.	Variety of etiologies including alcohol and nonsteroidal antiinflammatory drugs (NSAIDs).
Functional dyspepsia	The presence of one or more of the following: postprandial fullness, early satiation, epigastric pain, or burning.	Patients have no evidence of structural disease.
Gastroparesis	Nausea, vomiting, abdominal pain, early satiety, postprandial fullness, and bloating.	Most causes are idiopathic, diabetic, or postsurgical.

Graphic 106200 Version 2.0

Causes of right upper quadrant (RUQ) abdominal pain

RUQ	Clinical features	Comments
Biliary		
Biliary colic	Intense, dull discomfort located in the RUQ or epigastrium. Associated with nausea, vomiting, and diaphoresis. Generally lasts at least 30 minutes, plateauing within one hour. Benign abdominal examination.	Patients are generally well-appearing.
Acute cholecystitis	Prolonged (>4 to 6 hours) RUQ or epigastric pain, fever. Patients will have abdominal guarding and Murphy's sign.	
Acute cholangitis	Fever, jaundice, RUQ pain.	May have atypical presentation in older adults or immunosuppressed patients.
Sphincter of Oddi dysfunction	RUQ pain similar to other biliary pain.	Biliary type pain without other apparent causes.
Hepatic		
Acute hepatitis	RUQ pain with fatigue, malaise, nausea, vomiting, and anorexia. Patients may also have jaundice, dark urine, and light-colored stools.	Variety of etiologies include hepatitis A, alcohol, and drug-induced.
Perihepatitis (Fitz-Hugh-Curtis syndrome)	RUQ pain with a pleuritic component, pain is sometimes referred to the right shoulder.	Aminotransferases are usually normal or only slightly elevated.
Liver abscess	Fever and abdominal pain are the most common symptoms.	Risk factors include diabetes, underlying hepatobiliary or pancreatic disease, or liver transplant.
Budd-Chiari syndrome	Symptoms include fever, abdominal pain, abdominal distention (from ascites), lower extremity edema, jaundice, gastrointestinal bleeding, and/or hepatic encephalopathy.	Variety of causes.
Portal vein thrombosis	Symptoms include abdominal pain, dyspepsia, or gastrointestinal bleeding.	Clinical manifestations depend on extent of obstruction and speed of development. Most commonly associated with cirrhosis.

Graphic 106199 Version 3.0

Less common causes of abdominal pain

Abdominal aortic aneurysm
Abdominal compartment syndrome
Abdominal migraine
Acute intermittent porphyria
Angioedema (either hereditary or angiotensin-converting enzyme [ACE] inhibitor-related)
Celiac artery compression syndrome
Chronic abdominal wall pain
Colonic pseudo-obstruction (acute or chronic)
Eosinophilic gastroenteritis
Epiploic appendagitis
Familial Mediterranean fever
Helminthic infections
Herpes zoster
Hypercalcemia
Hypothyroidism
Lead poisoning
Meckel's diverticulum
Narcotic bowel syndrome
Paroxysmal nocturnal hemoglobinuria
Pseudoappendicitis
Pulmonary etiologies
Rectus sheath hematoma
Renal infarction
Rib pain
Sclerosing mesenteritis
Somatization
Wandering spleen

Graphic 106205 Version 5.0

Differential diagnosis of foodborne disease by item consumed

Item	Commonly associated microbes*
Raw seafood	Norwalk-like virus, *Vibrio* spp, hepatitis A
Raw eggs	*Salmonella* spp
Undercooked meat or poultry	*Salmonella* spp, *Campylobacter* spp, STEC, *Clostridium perfringens*
Unpasteurized milk or juice	*Salmonella* spp, *Campylobacter* spp, STEC, *Yersinia enterocolitica*
Unpasteurized soft cheeses	*Salmonella* spp, *Campylobacter* spp, STEC, *Y. enterocolitica*, *Listeria monocytogenes*
Homemade canned goods	*Clostridium botulinum*
Raw hot dogs, deli meat	*L. monocytogenes*

STEC: shiga toxin-producing *Escherichia coli*.
* This association lists the commonly associated organisms and is not fully comprehensive.

Graphic 58714 Version 3.0

Extraintestinal manifestations of inflammatory bowel disease

Common extraintestinal manifestations
Musculoskeletal
Arthritis – Colitic type, ankylosing spondylitis, isolated joint involvement such as sacroiliitis.
Hypertrophic osteoarthropathy – Clubbing, periostitis, metastatic Crohn disease.
Miscellaneous – Osteoporosis, aseptic necrosis, polymyositis, osteomalacia.
Skin and mouth
Reactive lesions – Erythema nodosum, pyoderma gangrenosum, aphthous ulcers, vesiculopustular eruption, cutaneous vasculitis, neutrophilic dermatosis, metastatic Crohn disease, epidermolysis bullosa acquisita.
Specific lesions – Fissures and fistulas, oral Crohn disease, drug rashes.
Nutritional deficiency – Acrodermatitis enteropathica (zinc), purpura (vitamins C and K), glossitis (vitamin B), hair loss and brittle nail (protein).
Associated diseases – Vitiligo, psoriasis, amyloidosis, epidermolysis bullosa acquisita.
Hepatobiliary
Specific complications – PSC and bile duct carcinoma, small duct PSC, cholelithiasis.
Associated inflammation – Autoimmune chronic active hepatitis, pericholangitis, portal fibrosis and cirrhosis, granuloma in Crohn disease.
Metabolic – Fatty liver, gallstones associated with ileal Crohn disease.
Ocular
Uveitis iritis, episcleritis, scleromalacia, corneal ulcers, retinal vascular disease, retrobulbar neuritis, Crohn keratopathy.
Metabolic
Growth retardation in children and adolescents, delayed sexual maturation.
Less common extraintestinal manifestations
Blood and vascular
Anemia due to iron, folate, or vitamin B12 deficiency or autoimmune hemolytic anemia, anemia of chronic disease, thrombocytopenic purpura; leukocytosis and thrombocytosis; thrombophlebitis and thromboembolism, arteritis and arterial occlusion, polyarteritis nodosa, Takayasu arteritis, cutaneous vasculitis, anticardiolipin antibody, hyposplenism.
Renal and genitourinary tract
Urinary calculi (oxalate stones in ileal disease), local extension of Crohn disease involving ureter or bladder, amyloidosis, drug-related nephrotoxicity.
Renal tubular damage with increased urinary excretion of various enzymes (eg, beta N-acetyl-D-glucosaminidase).
Neurologic
Up to 3% of patients may have non-iatrogenic neurologic involvement, including peripheral neuropathy, myelopathy, vestibular dysfunction, pseudotumor cerebri, myasthenia gravis, and cerebrovascular disorders. Incidence equal in ulcerative colitis and Crohn disease. These disorders usually appear 5 to 6 years after the onset of inflammatory bowel disease and are frequently associated with other extraintestinal manifestations.
Airway and parenchymal lung disease
Pulmonary fibrosis, vasculitis, bronchitis, necrobiotic nodules, acute laryngotracheitis, interstitial lung disease, sarcoidosis. Abnormal pulmonary function tests without clinical symptoms are common (up to 50% of cases).
Cardiac
Pericarditis, myocarditis, endocarditis, and heart block – More common in ulcerative colitis than in Crohn disease; cardiomyopathy, cardiac failure due to anti-TNF therapy.
Pericarditis may also occur from sulfasalazine/5-aminosalicylates.
Pancreas
Acute pancreatitis – More common in Crohn disease than in ulcerative colitis. Risk factors include 6-mercaptopurine and 5-aminosalicylate therapy, duodenal Crohn disease.
Autoimmune
Drug-induced lupus and autoimmune diseases secondary to anti-TNF-alpha therapy.
Positive ANA, anti-double-stranded DNA, cutaneous and systemic manifestations of lupus.

PSC: primary sclerosing cholangitis; TNF: tumor necrosis factor; ANA: antinuclear antibody.

Modified from: Das KM. Relationship of extraintestinal involvements in inflammatory bowel disease: New insights into autoimmune pathogenesis. Dig Dis Sci 1999; 44:1.

Graphic 81867 Version 11.0

Drugs associated with constipation

Analgesics
Anticholinergics
Antihistamines
Antispasmodics
Antidepressants
Antipsychotics
Cation-containing agents
Iron supplements
Aluminum (antacids, sucralfate)
Barium
Neurally active agents
Opiates
Antihypertensives
Ganglionic blockers
Vinca alkaloids
Calcium channel blockers
5HT3 antagonists

Graphic 62307 Version 2.0

Causes of lower abdominal pain

Lower abdomen	Localization	Clinical features	Comments
Appendicitis	Generally right lower quadrant	Periumbilical pain initially that radiates to the right lower quadrant. Associated with anorexia, nausea, and vomiting.	Occasional patients present with epigastric or generalized abdominal pain.
Diverticulitis	Generally left lower quadrant; right lower quadrant more common in Asian patients	Pain usually constant and present for several days prior to presentation. May have associated nausea and vomiting.	Clinical presentation depends on severity of underlying inflammatory process and whether or not complications are present.
Nephrolithiasis	Either	Pain most common symptom, varies from mild to severe. Generally flank pain, but may have back or abdominal pain.	Cause symptoms as stone passes from renal pelvis to ureter.
Pyelonephritis	Either	Associated with dysuria, frequency, urgency, hematuria, fever, chills, flank pain, and costovertebral angle tenderness.	
Acute urinary retention	Suprapubic	Present with lower abdominal pain and discomfort; inability to urinate.	
Cystitis	Suprapubic	Associated with dysuria, frequency, urgency, and hematuria.	
Infectious colitis	Either	Diarrhea as the predominant symptom, but may also have associated abdominal pain, which may be severe.	Patients with *Clostridioides* (formerly *Clostridium*) *difficile* infection can present with an acute abdomen and peritoneal signs in the setting of perforation and fulminant colitis.

Graphic 106202 Version 3.0

Differential diagnosis of dyspepsia

Diagnosis
Functional dyspepsia
Dyspepsia caused by structural or biochemical disease
Peptic ulcer disease
Gastroesophageal reflux disease (GERD)
Biliary pain
Chronic abdominal wall pain
Gastric or esophageal cancer
Gastroparesis
Pancreatitis
Carbohydrate malabsorption
Medications (including potassium supplements, digitalis, iron, theophylline, oral antibiotics [especially ampicillin and erythromycin], nonsteroidal antiinflammatory drugs [NSAIDs], glucocorticoids, niacin, gemfibrozil, narcotics, colchicine, quinidine, estrogens, levodopa)
Infiltrative diseases of the stomach (eg, Crohn disease, sarcoidosis)
Metabolic disturbances (hypercalcemia, hyperkalemia)
Hepatocellular carcinoma
Ischemic bowel disease, celiac artery compression syndrome, superior mesenteric artery syndrome
Systemic disorders (diabetes mellitus, thyroid and parathyroid disorders, connective tissue disease)
Intestinal parasites (*Giardia*, *Strongyloides*)
Abdominal cancer, especially pancreatic cancer

Adapted from:

1. *Talley NJ, Silverstein MD, Agreus L, et al. American Gastroenterological Association (AGA) technical review: evaluation of dyspepsia. Gastroenterology 1998; 114:582.*
2. *Fisher RS, Parkman HP. Management of nonulcer dyspepsia. N Engl J Med 1998; 339:1376.*

Graphic 90590 Version 10.0

Pelvic causes of abdominal pain in women

Pelvic causes of abdominal pain in women	Lateralization	Clinical features	Comments
Ectopic pregnancy	Either side or diffuse abdominal pain	Vaginal bleeding with abdominal pain, typically six to eight weeks after last menstrual period.	Patients can present with life-threatening hemorrhage if ruptured.
Pelvic inflammatory disease	Lateralization uncommon	Characterized by the acute onset of lower abdominal or pelvic pain, pelvic organ tenderness, and evidence of inflammation of the genital tract. Often associated with cervical discharge.	Wide spectrum of clinical presentations.
Ovarian torsion	Localized to one side	Acute onset of moderate-to-severe pelvic pain, often with nausea and possibly vomiting, in a woman with an adnexal mass.	Generally not associated with vaginal discharge.
Ruptured ovarian cyst	Localized to one side	Sudden-onset unilateral lower abdominal pain. The classic presentation is sudden onset of severe focal lower quadrant pain following sexual intercourse.	Generally not associated with vaginal discharge.
Endometriosis		Associated with dysmenorrhea, pelvic pain, dyspareunia, and/or infertility, but other symptoms may also be present (eg, bowel or bladder symptoms).	Patients may present with one symptom or a combination of symptoms.
Acute endometritis		Most often preceded by pelvic inflammatory disease.	Diagnostic criteria the same as pelvic inflammatory disease.
Chronic endometritis		Present with abnormal uterine bleeding, which may consist of intermenstrual bleeding, spotting, postcoital bleeding, menorrhagia, or amenorrhea. Vague, crampy lower abdominal pain accompanies the bleeding or may occur alone.	
Leiomyomas (fibroids)		Symptoms related to bulk or infrequently acute pain from degeneration or torsion of pedunculate tumor. Pain may be associated with a low-grade fever, uterine tenderness on palpation, elevated white blood cell count, or peritoneal signs.	
Ovarian hyperstimulation		Abdominal distention/discomfort, nausea/vomiting, and diarrhea. More severe cases can have severe abdominal pain, ascites, intractable nausea, and vomiting.	Women undergoing fertility treatment.
Ovarian cancer		Abdominal or pelvic pain. May have associated symptoms of bloating, urinary urgency or frequency, or difficulty eating/feeling full quickly.	
Ovulatory pain (Mittelsmerz)		Occurs mid-cycle, coinciding with timing of ovulation.	May be right- or left-sided, depending on site of ovulation during that cycle.
Pregnancy and related complications*			

* Refer to the UpToDate topics on abdominal pain.

Graphic 106204 Version 3.0

Causes of acute pelvic pain in adult women by organ system

Reproductive tract
Gynecologic: Infectious
▪ Pelvic inflammatory disease
▪ Endometritis
▪ Salpingitis
▪ Tubo-ovarian abscess
Gynecologic: Noninfectious
▪ Dysmenorrhea
▪ Ovarian cyst (ruptured or intact)
▪ Endometriosis
▪ Uterine leiomyoma (fibroid): Degenerating or not
▪ Adenomyosis
▪ Mittelschmerz (midcycle ovulatory pain)
▪ Adnexal torsion (ovary and/or fallopian tube)
▪ Ovarian hyperstimulation syndrome
▪ Endosalpingiosis
▪ Uterine perforation (in women who have undergone a uterine procedure)
▪ Asherman's syndrome
▪ Neoplasm
Pregnancy-related
First trimester
▪ Threatened abortion
▪ Ectopic pregnancy, including heterotopic pregnancy
▪ Corpus luteum hematoma
▪ Incomplete abortion
▪ Septic abortion
▪ Uterine impaction
Second and third trimesters
▪ Preterm labor
▪ Chorioamnionitis
▪ Placental abruption
▪ Degenerating uterine leiomyoma (fibroid)
▪ Medical complications during pregnancy, such as appendicitis
▪ Round ligament stretch
Postpartum
▪ Endometritis
▪ Wound infection (cesarean section, laceration, or episiotomy repair)
▪ Ovarian vein thrombosis or septic pelvic thrombophlebitis

Gastrointestinal
Appendicitis
Irritable bowel syndrome
Diverticulitis
Inflammatory bowel disease
Fecal impaction or constipation
Gastroenteritis
Mesenteric lymphadenitis
Abdominopelvic adhesions
Perforated viscus
Bowel obstruction
Incarcerated or strangulated hernia
Ischemic bowel
Hirschsprung disease[1]
Intussusception[2]
Meckel's diverticulum[3]
Volvulus[4]
Urinary tract
Cystitis
Pyelonephritis
Painful bladder syndrome
Kidney stones
Urinary retention
Malignancy (bladder cancer)
Vascular
Abdominal aortic aneurysm and dissection
Sickle cell disease crisis
Septic pelvic thrombophlebitis
Ovarian vein thrombosis
Pelvic congestion syndrome
Musculoskeletal
Muscular strain or sprain
Abdominal wall hematoma or infection
Hernia (inguinal or femoral)
Pelvic fracture
Myofascial pain
Neurologic
Herpes zoster
Anterior cutaneous nerve entrapment syndrome
Abdominal epilepsy[5]
Abdominal migraine[6]
Psychiatric
Depression
Somatization disorder
Narcotic seeking
Sexual and interpersonal
Domestic violence
Sexual abuse
Other
Familial Mediterranean Fever
Porphyria[7]
Lead poisoning
TNF receptor-associated periodic syndrome (ie, TRAPS)

This table presents common etiologies but is not meant to be exhaustive.

TNF: tumor necrosis factor; TRAPS: tumor necrosis factor receptor-associated periodic syndrome.

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1. *Qiu JF, Shi YJ, Hu L, et al. Adult Hirschsprung's disease: report of four cases. Int J Clin Exp Pathol 2013; 6:1624.*
2. *Lu T. Adult Intussusception. Perm J 2015; 19:79.*
3. *Dumper J, Mackenzie S, Mitchell P, et al. Complications of Meckel's diverticula in adults. Can J Surg 2006; 49:353.*
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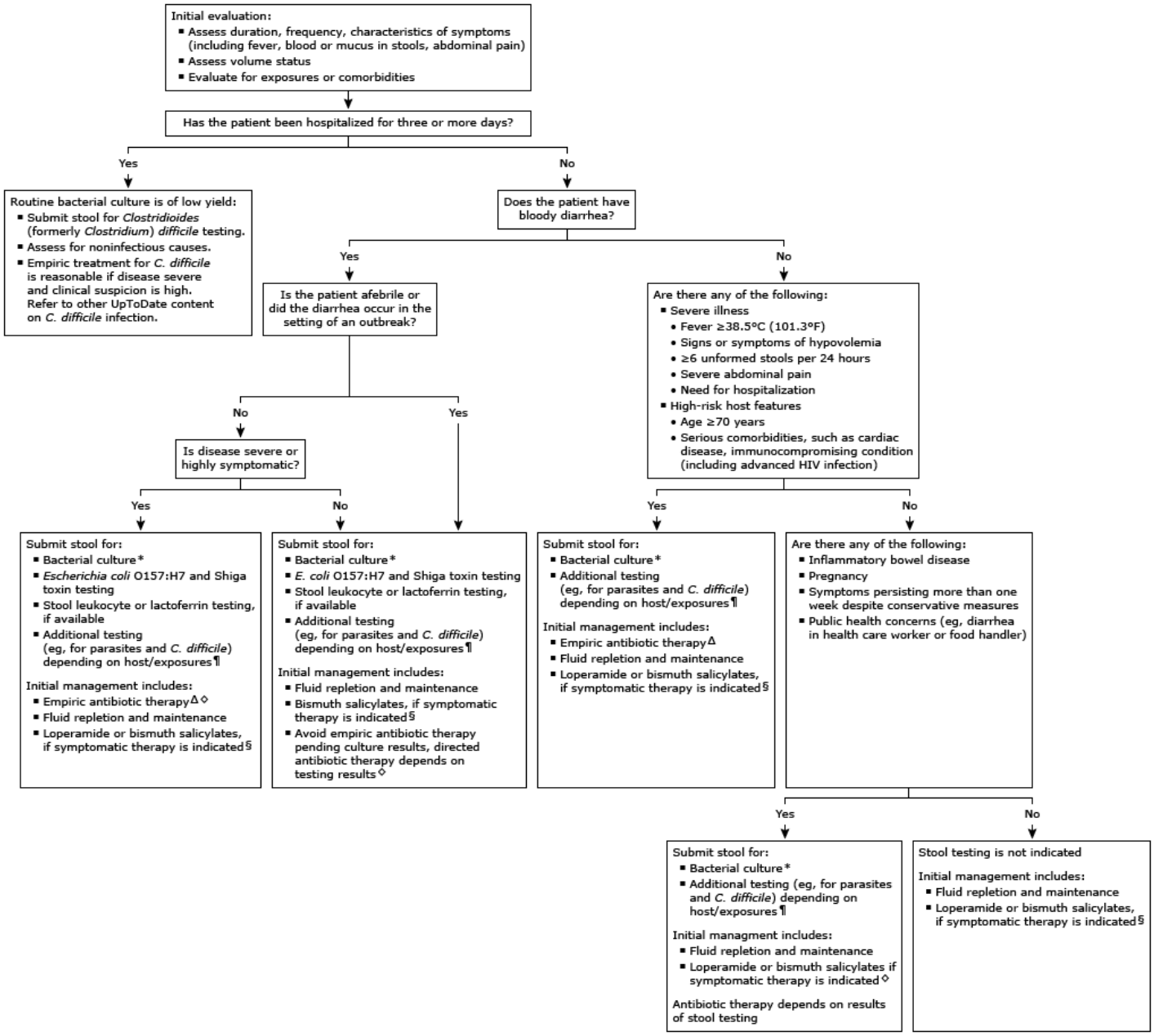
Adapted from: Lipsky AM, Hart D. Acute pelvic pain. In: Rosen's Emergency Medicine: Concepts and Clinical Practice, 9th ed, Walls RM, Hockberger RS, Gausche M, et al (Eds), Elsevier, Philadelphia 2018.

Graphic 120867 Version 1.0

Evaluation of acute diarrhea in adults



This algorithm outlines an approach to the work-up and initial management of adults with acute diarrhea acquired in resource-rich settings, with a focus on infectious etiologies, which are the most common causes. Refer to UpToDate content on acute diarrhea in resource-rich settings for more detail.

STEC: Shiga toxin-producing *Escherichia coli*; HIV: human immunodeficiency virus.

* Routine stool culture will identify *Salmonella*, *Campylobacter*, and *Shigella*. If other bacterial organisms (eg, *Vibrio*, *Listeria*, *Yersinia*, *Aeromonas*) are suspected based on exposures, the laboratory should be notified for specific plating of the specimen. Some laboratories perform multiplex molecular testing of stool to test for multiple organisms simultaneously; the indications for such testing are similar to those for stool cultures.

¶ Individuals who have had antibiotic use or hospitalization within the prior three months should be tested for *C. difficile*. Testing for *C. difficile* is also often performed in patients with inflammatory bowel disease. Testing for parasites (microscopy, antigen testing, molecular testing) is generally not warranted for acute diarrhea but is appropriate in patients with persistent diarrhea (>7 days), in patients with advanced HIV infection (CD4 cell count <200 cells/microL), in men who have sex with men, in the setting of a community waterborne outbreak, and if stool leukocytes/lactoferrin is negative in patients with bloody diarrhea.

Δ Empiric antibiotic therapy can reduce the duration of diarrhea and other symptoms by several days, but the benefits of antibiotics do not outweigh potential drawbacks in most patients with acute diarrhea. For these select patients (with or at high risk for severe disease, with dysentery, or with persistent disease) empiric antibiotic treatment is reasonable, as symptom reduction may have a greater relative benefit in such patients. When indicated, azithromycin or a fluoroquinolone is used for empiric antibiotic therapy. In particular, azithromycin is preferred for patients with fever, dysentery, or risk factors for fluoroquinolone-resistant infection. Empiric antibiotic therapy should be tailored to results of stool testing, if appropriate.

◇ We withhold empiric antibiotic therapy until stool testing has ruled out STEC or Shiga toxin production in stable patients when the likelihood of STEC is higher (eg, bloody diarrhea in the setting of an outbreak or in an afebrile patient). However, for adults with highly symptomatic or severe bloody diarrhea, the benefits of antibiotic therapy may outweigh the low risk of potential complications from treating STEC.

§ Loperamide and bismuth salicylates are both effective in reducing the duration and frequency of diarrhea, but loperamide is somewhat more effective. However, we avoid loperamide in patients with evidence of dysentery (fever, bloody or mucous stools) unless antibiotics are also given because of concern for exacerbation of disease. Loperamide is also often avoided when *C. difficile* is suspected. Patients taking loperamide should be cautioned not to exceed the maximum daily dose.

Graphic 68348 Version 12.0

Causes of diffuse abdominal pain

Diffuse/poorly characterized	Clinical features	Comments
Bowel obstruction	Most common symptoms are nausea, vomiting, crampy abdominal pain, and obstipation. Distended, tympanic abdomen with high-pitched or absent bowel sounds.	Multiple etiologies.
Perforation of the gastrointestinal tract	Severe abdominal pain, particularly following procedures.	Can present acutely or in an indolent manner, particularly in immunosuppressed patients.
Acute mesenteric ischemia	Acute and severe onset of diffuse and persistent abdominal pain, often described as pain out of proportion to examination.	May occur from either arterial or venous disease. Patients with aortic dissection can have abdominal pain related to mesenteric ischemia.
Chronic mesenteric ischemia	Abdominal pain after eating ("intestinal angina"), weight loss, nausea, vomiting, and diarrhea.	May occur from either arterial or venous disease.
Inflammatory bowel disease (ulcerative colitis/Crohn disease)	Associated with bloody diarrhea, urgency, tenesmus, bowel incontinence, weight loss, and fevers.	May have symptoms for years before diagnosis. Associated extraintestinal manifestations (eg, arthritis, uveitis).
Viral gastroenteritis	Diarrhea accompanied by nausea, vomiting, and abdominal pain.	
Spontaneous bacterial peritonitis	Fever, abdominal pain, and/or altered mental status.	Most often in cirrhotic patients with advanced liver disease and ascites.
Dialysis-related peritonitis	Abdominal pain and cloudy peritoneal effluent. Other symptoms and signs include fever, nausea, diarrhea, abdominal tenderness, and rebound tenderness.	Only in peritoneal dialysis patients.
Colorectal cancer	Variable presentation, including obstruction and perforation.	
Other malignancy	Vary depending on malignancy.	
Celiac disease	Abdominal pain in addition to including diarrhea with bulky, foul-smelling, floating stools due to steatorrhea and flatulence.	
Ketoacidosis	Diffuse abdominal pain and nausea and vomiting.	
Adrenal insufficiency	Diffuse abdominal pain and nausea and vomiting.	Patients with adrenal crisis may present with shock and hypotension.
Foodborne illness	Mixture of nausea, vomiting, fever, abdominal pain and diarrhea.	
Irritable bowel syndrome	Chronic abdominal pain with altered bowel habits.	
Constipation		Associated with a variety of neurologic and metabolic disorders, obstruction lesions of the gastrointestinal tract, endocrine disorders, psychiatric disorders, and side effect of medications.
Diverticulosis	May have symptoms of abdominal pain and constipation.	Often an asymptomatic and incidental finding on colonoscopy or sigmoidoscopy.
Lactose intolerance	Associated with abdominal pain, bloating, flatulence, and diarrhea. Abdominal pain may be cramping in nature.	

Graphic 106203 Version 3.0

Major symptoms and signs of hypothyroidism

Mechanism	Symptoms	Signs
Slowing of metabolic processes	Fatigue and weakness Cold intolerance Dyspnea on exertion Weight gain Cognitive dysfunction Mental retardation (infantile onset) Constipation Growth failure	Slow movement and slow speech Delayed relaxation of tendon reflexes Bradycardia Carotenemia
Accumulation of matrix substances	Dry skin Hoarseness Edema	Coarse skin Puffy facies and loss of eyebrows Periorbital edema Enlargement of the tongue
Other	Decreased hearing Myalgia and paresthesia Depression Menorrhagia Arthralgia Pubertal delay	Diastolic hypertension Pleural and pericardial effusions Ascites Galactorrhea

Graphic 62676 Version 4.0

Contributor Disclosures

Robert M Penner, BSc, MD, FRCPC, MSc Speaker's Bureau: AbbVie [Inflammatory bowel disease (Adalimumab)]; Janssen [Inflammatory bowel disease (Infliximab, ustekinumab, golimumab)]; Takeda [Inflammatory bowel disease (Vedolizumab)]. Consultant/Advisory Boards: AbbVie [Inflammatory bowel disease (Adalimumab)]; Janssen [Inflammatory bowel disease (Infliximab, ustekinumab, golimumab)]; Takeda [Inflammatory bowel disease (Vedolizumab)] **Mary B Fishman, MD** Nothing to disclose **Andrew D Auerbach, MD, MPH** Nothing to disclose **Mark D Aronson, MD** Nothing to disclose **Lisa Kunins, MD** Nothing to disclose

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