Learning Objectives

• Label a diagram of the abdominal organs.
• Describe the function of the abdominal organs.
• Outline prehospital assessment of a patient who is complaining of abdominal pain.

Learning Objectives

• Distinguish between pain characteristics in abdominal pain.
• Describe general prehospital management techniques for a patient who is complaining of abdominal pain.

Gastrointestinal Anatomy

• Provides body with water, electrolytes, other nutrients used by cells
  – Major organs
    • Esophagus
    • Stomach
    • Small and large intestines
    • Liver
    • Gallbladder
    • Pancreas
Acute Abdominal Pain

• When abdominal pain is present, begin primary survey by ensuring scene is safe
  – Initial scene size up
  – Determine if abdominal pain is result of trauma or medical condition
    • May be evident from initial scene survey

Acute Abdominal Pain

• Nature of pain may become evident by obtaining information from patient, family, or bystanders
• Inspect nearby area for medication bottles and signs of alcohol or other drug use
  – May offer clues about cause of patient’s condition
  – If alcohol or other drug use is suspected, any containers of emesis should be transported with patient for laboratory analysis
Acute Abdominal Pain

- After primary survey to ensure adequacy of airway, breathing, and circulation, assessment of patient begins with thorough history focused on chief complaint
  - Assess and document baseline vital signs and perform systematic physical examination
    - Helps identify abdominal emergencies
    - May indicate development of shock or need for immediate transport for surgical intervention

History

- When obtaining history of abdominal pain, attempt to identify
  - Location
  - Type of pain
  - Associated signs and symptoms
- Using mnemonic OPQRST or similar method can help organize this information

History

- OPQRST evaluation
  - O (Onset)
    - Was the onset of the pain sudden?
    - What were you doing when it started?
  - P (Provocative/palliative)
    - What makes the pain better?
    - What makes the pain worse?
    - Does a sitting or lying position affect your discomfort?
    - Does a deep breath increase the pain?
    - Does the pain change after you eat or drink?
History

• OPQRST evaluation
  – Q (Quality)
    • What does the pain feel like?
    • Is it sharp, dull, burning, tearing?
  – R (Region)
    • Where is the pain located?
    • Does it travel (radiate) to another area of the body, or does it stay in the same place?

• OPQRST evaluation
  – S (Severity)
    • Is the pain mild, moderate, or severe?
    • What is the degree of discomfort on a scale of 0 to 10 (with 10 being the worst)?
  – T (Time)
    • When did the pain begin?
    • Is it constant or intermittent?
    • If intermittent, how long does the pain episode last?

• Can use SAMPLE history
  – Signs and symptoms
  – Allergies
  – Medications
  – Past medical history
  – Last meal or oral intake
  – Events before the emergency
History

• Can use SAMPLE history
  – Helps identify
    • Symptoms
    • Allergies
    • Medical history
    • Last oral intake
    • Events that preceded patient’s chief complaint

• Other important elements: recent illness and past significant medical history
  – Hypertension or cardiac or respiratory disease that may manifest in abdominal pain
  – Medication use
  – Alcohol or other drug use
  – Last bowel movement and any significant changes in patient’s bowel habits

• Other important elements: recent illness and past significant medical history
  – Previous abdominal surgeries
  – Women of childbearing age also should be questioned about menstrual periods
    • Regularity
    • Date of last menstrual period
  – Possibility of pregnancy
What factors can influence a patient’s perception and description of pain?

Abdominal Pain Location and Type
- To assess specific disorder, use method that relates to anatomical location of and structures to origin
- Types of abdominal pain that may result from chronic or acute episodes may be classified as visceral, somatic, and referred

Visceral Pain
- Organ pain
  - Caused by stimulation of autonomic nerve fibers that surround an organ
  - Can be caused by compression and inflammation of solid organs and by distention or stretching of hollow organs or ligaments
  - Patient usually describes pain as cramping or gas-type pain
Visceral Pain

• Organ pain
  – Patients often describe pain as
    • Varying in intensity
    • Increasing to high degree of severity, then subsiding
  – Generally diffuse
  – Difficult to localize

Visceral Pain

• Often pain is centered at umbilicus or lower in midline
• Often associated with other symptoms of autonomic nerve involvement such as
  – Tachycardia
  – Diaphoresis
  – Nausea
  – Vomiting

Visceral Pain

• Common causes
  – Early appendicitis
  – Pancreatitis
  – Cholecystitis
  – Intestinal obstruction
Somatic Pain

- Produced by bacterial or chemical irritation of nerve fibers in peritoneum (peritonitis)
  - Usually constant
  - Localized to specific area
  - Described as sharp or stabbing
  - Patient is hesitant to move about
    - May lie on back or side with legs flexed to prevent additional pain from stimulation of peritoneal area

Somatic Pain

- Often exhibit involuntary guarding of abdomen during physical examination and rebound tenderness (signs of peritoneal inflammation)
- Common causes
  - Appendicitis
  - Inflamed or perforated viscus (ulcer, gallbladder, or small or large intestine)

Referred Pain

- Pain in part of body considerably removed from tissues that cause pain
  - Results from branches of visceral fibers that synapse in spinal cord with same second-order neurons that receive pain fibers from skin
  - When pain fibers are stimulated intensely, pain sensations spread
  - Pain in areas distant from original source
Referral Pain

- Knowledge is important because many visceral ailments cause no other symptoms except referred pain
  - Example:
    - Cardiac pain may be referred to neck and jaw, shoulders, pectoral muscles, and down arms
    - Biliary pain to right subcapular area
    - Renal colic to genitalia and flank area
    - Uterine and rectal pain to lower back
    - Leaking aortic aneurysm to lower back or buttocks

Acute Abdominal Pain

- Signs and symptoms
  - Nausea, vomiting, anorexia
  - Appendicitis
  - Biliary tract disease
  - Gastritis
  - High intestinal obstruction
  - Pancreatitis
  - Diarrhea
  - Inflammatory process (gastroenteritis, ulcerative colitis)
Acute Abdominal Pain

- Signs and symptoms
  - Constipation
  - Dehydration, obstruction, medication-induced decreased intestinal motility (codeine, morphine)
  - Change in stool color
  - Biliary tract obstruction (clay-colored stools)
  - Lower intestinal bleeding (black, tarry stools)
  - Chills and fever
  - Appendicitis
  - Bacterial infection
  - Cholecystitis
  - Pyelonephritis

Vital Signs

- Should include evaluation and documentation of
  - BP
  - Pulse rate (including ECG assessment)
  - Respiratory rate
  - Skin color, moisture, temperature, and turgor
  - Presence/absence of orthostatic pulse and BP changes

Vital Signs

- Rise from recumbent position to sitting or standing position associated with fall in systolic pressure (after 1 minute) of 10 to 15 mm Hg and/or a concurrent rise in pulse rate (after 1 minute) of 10 to 15 beats/minute
  - Indicates significant volume depletion and decrease in perfusion status
- Perform assessment of BP, pulses, and capillary refill in each extremity as consideration for aortic dissection
Physical Examination

• Includes
  – Skills of inspection
  – Auscultation
  – Percussion
  – Palpation
• If life-threatening illness suspected, rapid stabilization and transportation is the first priority
  – Further examination completed en route

Inspection

• In initial patient encounter, paramedic should note position in which the patient is lying
  – Abdominal peritoneal irritation: lie on their sides
    • Often have knees flexed and pulled in toward chests
• Other visual clues of abdominal pain
  – Skin color
  – Facial expressions such as grimacing
  – Presence/absence of voluntary movement

Inspection

• Remove patient’s clothing (ensure privacy), inspect abdominal wall for
  – Bruises
  – Scars
  – Ascites
  – Abdominal distention
  – Abdominal masses
Auscultation

- Determining presence/absence of bowel sounds by auscultation usually reserved for assessment in emergency department
  - If performed, should be done for about 2 minutes in each quadrant before determining absent bowel sounds
- Auscultation should always precede palpation and percussion because these procedures may alter intensity of bowel sounds

Auscultation

- Bowel sounds increased in number, duration, or intensity indicate possibility of gastroenteritis or intestinal obstruction
- Bowel sounds considerably decreased in number and intensity (or their absence) may indicate peritonitis or ileus (obstruction of intestine)
Palpation

- Begin palpation of abdomen gently and avoid painful area until remainder of abdomen is examined, note
  - Signs of rigidity or spasm
  - Tenderness or masses
  - Patient’s facial expressions
  - May provide clues about severity of pain
  - Identify abdomen as soft or rigid

Percussion

- If time permits, general assessment of tympany and dullness by percussion may be performed
  - Detects presence of fluid, air, or solid masses in abdomen
  - Use systematic approach and move from side to side or clockwise
  - Note tenderness and abdominal skin temperature and color
  - Tympany is major sound that should be noted during percussion because of normal presence of air in stomach and intestines
  - Dullness should be heard over organs and solid masses

Abdominal Emergency Management

- Patients with acute abdominal pain or GI bleeding cannot be managed effectively in prehospital setting
  - Majority require extensive evaluation in emergency department
    - Laboratory analysis
    - Radiological imaging
    - Fluid and medication therapy
    - Surgical intervention
Abdominal Emergency Management

- Goals
  - Support patient’s airway and ventilatory status
  - Perform and document initial patient assessment, including thorough history
  - Monitor vital signs and cardiac rhythm
  - Initiate IV therapy for fluid replacement or fluid resuscitation
  - Administer analgesics and antiemetics per protocol
  - Transport patient rapidly for physician evaluation

Specific Abdominal Emergencies

- Can result from inflammation, infection, and obstruction
- Some disorders may be associated with upper GI bleeding
  - Lesions
  - Peptic ulceration
  - Esophagogastric varices
Specific Abdominal Emergencies

- Associated with lower GI bleeding
  - Colonic lesions
  - Diverticulosis
  - Hemorrhoids

- Other disorders more often associated with acute abdominal pain in absence of bleeding
  - Pancreatitis
  - Cholecystitis

Lesson 29.2
Specific Abdominal and Gastrointestinal Disorders

Learning Objective

- Describe signs and symptoms, complications, and prehospital management for the following abdominal and gastrointestinal (GI) disorders: gastrointestinal bleeding, acute and chronic gastroenteritis, ulcerative colitis, diverticulosis, appendicitis, peptic ulcer disease, bowel obstruction, Crohn’s disease, pancreatitis, esophagogastric varices, hemorrhoids, cholecystitis, acute hepatitis, and hereditary hemochromatosis.
Gastrointestinal Bleeding

• Common clinical problem seen by paramedics
  – Often requires hospitalization
• Can vary from chronic blood loss to a massive, life-threatening hemorrhage
  – Massive hemorrhage may be difficult to control

Gastrointestinal Bleeding

• Many bleeding episodes resolve spontaneously
  – Physician evaluation to identify bleeding site is crucial to help prevent recurrence
  – Bleeding from the GI tract can be classified by site of origin as upper or lower GI bleeding

Gastrointestinal Bleeding

• Causes
  – Peptic ulcer disease
  – Variceal rupture
  – Mallory-Weiss syndrome
  – Cancers of esophagus or stomach
Gastrointestinal Bleeding

- Factors that may aggravate upper GI bleeding
  - Use of nonsteroidal anti-inflammatory drugs such as aspirin, other antiarthritic drugs
  - Chronic liver disease
  - Blood-thinning medications (e.g., warfarin)
  - Underlying medical conditions such as renal disease, hypertension, and cardiorespiratory diseases

Gastrointestinal Bleeding

- Upper GI bleeding: more than 300,000 hospitalizations/year, mortality rate of about 10 percent
- Risk factors
  - Increasing age
  - Alcohol and tobacco use
  - Coexisting illness such as
    - Hypertension
    - Diabetes
    - Cardiorespiratory disease

Gastrointestinal Bleeding

- Lower gastrointestinal (colon) bleeding causes
  - Diverticulosis
  - Colon cancers
  - Colon polyps
  - Inflammatory bowel disorders such as
    - Ulcerative colitis
    - Crohn's disease
Gastrointestinal Bleeding

• Lower GI bleeding may be mild or brisk and difficult to control
  – Common complaints
    • Cramping abdominal pain
    • Diarrhea (which may be bloody)
    • Nausea
    • Vomiting
    • Changes in patient’s stool and bowel habits

Gastrointestinal Bleeding

• Seriousness of GI bleeding depends on acuteness and source of blood loss
  – Mild chronic GI blood loss may present without any noticeable bleeding
  – Can result in iron deficiency anemia
    • Patients often are unaware

Gastrointestinal Bleeding

• Patients with severe cases of chronic or acute bleeding can have signs of anemia
  – Weakness
  – Pallor
  – Dizziness
  – Shortness of breath
  – Angina
Gastrointestinal Bleeding

- More serious GI bleeding may occur with hematemesis (bloody vomitus)
  - Vomit may be red or have dark, coffee ground-like appearance
  - Blood in stool could present as bright red, dark and clotted, or black and tarry
  - Presentation depends on location of bleeding source
    - Black, tarry stool (melena) often indicates upper GI source of bleeding where blood has been partially digested

Gastrointestinal Bleeding

- Bleeding also could originate from small intestine or right colon
  - Bright, red blood from rectum (hematochezia) after bowel movement usually signifies bleeding source close to rectal opening.
  - Such bleeding often results from hemorrhoid
  - Other causes
    - Rectal cancers
    - Polyps
    - Ulcerations or infections

Gastrointestinal Bleeding

- Any source of active GI bleeding requires hospitalization
  - Hypovolemia can be managed with IV fluids or blood transfusions if needed
- Attempts to identify and stop source of hemorrhage may include the use of
  - Medications
Gastrointestinal Bleeding

- Diagnostic tests
  - Barium GI studies
  - Nuclear scans
  - Angiography
  - Endoscopy
  - Colonoscopy
  - Gastric lavage
  - Placement of Sengstaken-Blakemore tube (to tamponade bleeding in esophagus)
  - Surgery

Gastrointestinal Bleeding

- Prehospital care for patients with active and severe GI bleeding
  - Emotional support
  - Administration of high-concentration O₂
  - Airway and ventilatory management
  - IV fluid resuscitation should begin with 2-liter fluid bolus in adults (20 mL/kg in children) to maintain BP
  - Pneumatic antishock garment should be considered (per protocol)
  - Rapid transport

Acute Gastroenteritis

- Inflammation of stomach and intestines with an associated sudden onset of vomiting, diarrhea, or both
- Common problem worldwide
  - Responsible for more than 4 million deaths per year in developing countries
Acute Gastroenteritis

• May be caused by
  – Bacterial or viral infection
  – Parasites
  – Chemical toxins
  – Allergies
  – Lactose intolerance
  – Immune disorders
• Inflammation causes hemorrhage and erosion of mucosal layers of GI tract
  – Can affect way in which water and nutrients are absorbed

Acute Gastroenteritis

• Infectious forms usually caused by exposure to
  – Rotavirus
  – Adenovirus
  – Astrovirus
  – Norwalk virus
  – Group of Noroviruses

Acute Gastroenteritis

• Often called “stomach flu,” not caused by influenza viruses
  – Children under 5 years of age are most vulnerable to rotaviruses
    • Most common cause of watery diarrhea in children
  – Adenoviruses and astroviruses cause diarrhea mostly in young children
    • Older children and adults also can be affected
Acute Gastroenteritis

• Norwalk virus and Noroviruses more likely to cause diarrhea in older children and adults
• Infectious acute gastroenteritis usually transmitted through fecal-oral route and by ingestion of infected food or contaminated water
• Common in institutional settings, group settings

Acute Gastroenteritis

• Infectious acute gastroenteritis
  – Arise among travelers in endemic areas
  – Can arise in populations in disaster areas where water supplies contaminated
  – Bacteria
    • Salmonella
    • Escherichia coli
    • Campylobacter
    • Staphylococcus

Acute Gastroenteritis

• Infectious acute gastroenteritis
  – Contamination results from
  • Poor sanitation
  • Lack of safe drinking water
  • Contaminated food
Acute Gastroenteritis
• Often abrupt and violent
  – Rapid loss of fluids and electrolytes from constant vomiting and diarrhea
  – Fluid loss and dehydration may be severe in pediatric patients, elderly, immunosuppressed
  – Possible developments
    • Hypokalemia
    • Hyponatremia
    • Acidosis (from prolonged diarrhea)
    • Alkalosis (from prolonged vomiting)

Acute Gastroenteritis
• Treatment
  – Mainly supportive
  – IV fluid replacement
  – Sedation
  – Bed rest
  – Medications to control vomiting and diarrhea
  – Bacterial causes treated with antibiotic therapy

Acute Gastroenteritis
• EMS personnel in disaster areas guidelines
  – Avoid patient contact if you are ill
  – Know source of water supplies
    • Drink hot beverages that have been boiled or disinfected
  – Avoid habits that aid fecal-oral/mucous membrane transmission
  – Observe body substance isolation precautions
  – Observe good hand-washing procedures
What would be your primary concern for the patient with a history of severe gastroenteritis?

**Chronic Gastroenteritis**

- Results from inflammation of stomach and intestines
  - Can produce long-term changes or damage to gastric mucosa
- Usually due to
  - Microbial infection
  - Hyperacidity
  - Chronic use of alcohol, aspirin, and other nonsteroidal anti-inflammatory medications

**Chronic Gastroenteritis**

- Results from
  - *Helicobacter pylori* infection
  - *E. coli*
  - *Klebsiella pneumoniae*
  - *Enterobacter*
  - *Campylobacter jejuni*
  - *Vibrio cholerae*
  - *Shigella*
  - *Salmonella*
Chronic Gastroenteritis

- Many bacteria responsible are part of normal intestinal flora
  - Precludes effective vaccination against these strains
- Other causes
  - Norwalk virus
  - Rotavirus
  - Parasitic infection from protozoa such as Giardia and Cryptosporidium parvum

Chronic Gastroenteritis

- Pathogenic agents responsible for disease
  - May be contracted via fecal-oral transmission
  - May be contracted by contaminated food and water
- Follow guidelines for personal safety

Chronic Gastroenteritis

- Signs and symptoms
  - Epigastric pain
  - Nausea and vomiting (which may be severe)
  - Fever
  - Anorexia
  - Mucosal bleeding (erosive gastritis)
  - Epigastric tenderness on palpation
  - In severe cases, hypovolemia and shock
Chronic Gastroenteritis

- Treatment
  - Diet regulation
  - Medications (antibiotics, antacids)
  - Fluid replacement or fluid resuscitation if hypovolemia or dehydration occurs

Ulcerative Colitis

- Colitis or proctitis
  - Inflammatory condition of large intestine
  - Classified as inflammatory bowel disease
  - Characterized by ulceration of mucosa of intestine
    - Occurs in rectum and lower part of colon but may affect entire colon
    - Inflammation makes colon empty often (causing diarrhea)
    - Ulceration causes bleeding and produces pus

Ulcerative Colitis

- Can occur at any age
  - Most often starts between ages 15 and 30, less often between ages 50 and 70
  - Affects men and women equally
  - Family history present in 10 to 15 percent of cases
  - Cause unknown
    - May be related to immune system and way it reacts to virus or bacterium that causes chronic inflammation in intestinal wall
    - Allergies to certain foods (e.g., lactose intolerance)
    - Environmental and psychological factors
Ulcerative Colitis

• Most common signs and symptoms
  – Fatigue
  – Weight loss
  – Anorexia
  – Rectal bleeding
  – Loss of body fluids and nutrients

Ulcerative Colitis

• Some have only mild symptoms
  – Others experience
    • Frequent fever
    • Bloody diarrhea
    • Nausea
    • Severe abdominal cramping
  – Some have remissions that last for months or years
    – Most patients’ symptoms eventually return

Ulcerative Colitis

• After physician evaluation and stabilization, usually managed with
  – Steroids
  – Electrolytes
  – Antibiotics
  – Diet regulation
  – Few require surgery to manage ulcerative colitis
    • Surgical removal of diseased colon may be indicated in severe cases
Ulcerative Colitis

• Prehospital care
  – Dictated by severity of condition
  – Care may vary from providing only emotional support, transportation for physician evaluation to providing airway, ventilatory, and circulatory support to manage hypovolemia and shock

Diverticulosis

• Diverticulum
  – Sac or pouch that develops in wall of colon
  – Common development with advancing years
  – Associated with diets low in fiber
  – Diverticular outpouchings
    • Known as diverticulosis
    • Tend to develop because of high pressure within contracting sigmoid colon that regulates movement of stool into rectum
Diverticulosis

• Outpouchings are most common at weakest point in colon wall
  – On left side just above rectum
  – As diverticulum expands, develops thin wall compared to rest of colon
    • Thin wall may allow bacteria to seep through and cause infection
    • Often there is small artery or arteriole in neck of diverticulum from which subsequent bleeding may occur

• Most patients are completely symptom free
  – Up to 30 percent of these patients experience diverticulitis when one or more diverticula become obstructed with fecal matter
  – Mild complications
    • Irregular bowel habits (alternating constipation and diarrhea)
    • Fever
    • Lower left quadrant pain

• Diverticulitis tends to reoccur within first 5 years after onset of symptoms
• Definitive care
  – Diet regulation
  – High-fiber diet to stimulate daily bowel movements
  – Antibiotic therapy
  – Surgical repair
**Diverticulosis**

- Serious complications associated with perforation of bowel
  - Massive bright red rectal bleeding
  - Or dark stools if bleeding is from diverticulum in right colon
  - Hemorrhage can occur rapidly, often painless, most common cause of massive rectal bleeding in older adults
    - If bacteria escape into abdomen, peritonitis or abscess may develop
    - Hemorrhage often ceases spontaneously
    - If bleeding does not stop, emergency surgery may be necessary

**Appendicitis**

- Common abdominal emergency
  - Occurs in 7 to 10 percent of U.S. population
  - May present at any age, but most patients are 8 to 25 years old
  - Rarely seen in children under 2 years of age

- Occurs when passageway between appendix and cecum is obstructed by fecal matter (fecalith)
- May be due to inflammation of area from viral or bacterial infection
- Obstruction of passageway leads to distention of appendix
Appendicitis

• Poor lymphatic and venous drainage allows bacterial infection to develop
  – If condition continues, inflamed organ eventually becomes gangrenous
  – Then appendix ruptures into peritoneal cavity
    • Results in peritonitis (which may progress to shock) or development of abscesses

Appendicitis

• Clinical presentation of appendicitis often inconsistent because of variations in
  – Position of appendix
  – Age of patient
  – Degree of inflammation
• Young children and older adults may have atypical illness because of reduced inflammatory response associated with extremes of age
  – Makes appendicitis more difficult to diagnose in these age groups

Appendicitis

• Classic presentation
  – Abdominal pain or cramping
  – Nausea
  – Vomiting
  – Chills
  – Low-grade fever
  – Anorexia
Appendicitis

• At first, pain is periumbilical and diffuse
  – Later pain becomes intense and localized to right lower quadrant just medial to iliac crest (McBurney point)
  – If appendix ruptures, patient’s pain diminishes before development of peritoneal signs
  – Goal of definitive care for appendicitis is surgical appendectomy before rupture

What other illnesses may be indicated by the signs and symptoms similar to those of appendicitis?

Peptic Ulcer Disease

• Results from complex pathological interaction among acidic gastric secretions and proteolytic enzymes and mucosal barrier
  – Digestion occurs as food passes through GI tract
  – Stomach produces hydrochloric acid and enzyme called pepsin to digest food
  – From stomach, food passes into duodenum
    • In duodenum, digestion and nutrient absorption continue
**Peptic Ulcer Disease**

- **Stomach**
  - Normally protects itself from digestive fluids by producing mucus to shield stomach tissues
  - Produces bicarbonate to neutralize and break down digestive fluids into substances less harmful to stomach tissue
  - Protection for stomach
    - Blood circulation to stomach lining
    - Cell renewal
    - Cell repair

**Causes:**
1. High acid and peptic content
2. Irritation
3. Poor blood supply
4. Poor secretion of mucus
5. Infection, *H. pylori*

**Peptic Ulcer Disease**

- Ulcers can form in stomach lining or duodenum where acid and pepsin are present
  - Sores cause disintegration and death of tissue as they erode mucosal layers in affected areas
    - If left untreated, massive hemorrhage or perforation may result
- Two main causes
  - *H. pylori* infection
  - Nonsteroidal anti-inflammatory drug use
Peptic Ulcer Disease

• Less common cause
  – Increased circulatory gastrin from gastrin-secreting tumors (Zollinger-Ellison syndrome)
  • Can cause defense mechanisms of stomach to fail
  • Ulcers can develop at any age
  • Rare among teenagers and even more uncommon in children
  – Duodenal ulcers occur for first time usually between the ages 30 and 50
  • More frequent in men than women

Peptic Ulcer Disease

• Patient usually is aware of condition
  – Uses over-the-counter antacids
• Pain
  – Burning or gnawing discomfort in epigastric region or left upper quadrant (in case of gastric ulcer)
  – Develops before meals (classically, early morning) or during stressful periods, when production of gastric acids increases
  – Usually sudden in onset
  – Often relieved by food intake, antacids, or vomiting

Peptic Ulcer Disease

• Patient may experience melena as result of blood passing through GI tract
• Prehospital care
  – Obtain pertinent history
  – Evaluate for hypotension
  – Provide circulatory support as needed
Peptic Ulcer Disease

- Definitive care
  - Antibiotics
  - Antacids
  - H2 receptor antagonists
  - Other medications
  - Diet regulation (benefit of which is controversial)
  - Some require hospitalization for fluid or blood replacement or for surgery if medications are not effective or blood loss is ongoing

Bowel Obstruction

- Occlusion of intestinal lumen
  - Results in blockage of normal flow of intestinal contents
- May be caused by ileus in which bowel does not work properly
  - More commonly results from mechanical obstruction such as
    - Adhesions
    - Hernia
    - Fecal impaction
    - Polyps
    - Tumors

- Other causes
  - Intussusception
    - Telescoping of one portion of intestine into another, which results in decreased blood supply of involved segment
  - Volvulus
    - Twisting of intestines
  - Ingested foreign bodies
Bowel Obstruction

• Other causes
  – Foreign bodies introduced from anus
    • Sexual or intentional insertion
  – Most occur in small bowel (accounting for 20 percent of all hospital admissions for abdominal complaints)
    • Usually caused by adhesions or herniae
    • Large bowel obstructions most often result from tumors or fecal impactions

Bowel Obstruction

• Signs and symptoms
  – Nausea and vomiting
  – Abdominal pain
  – Diarrhea
  – Constipation (late finding)
  – Abdominal distention

Bowel Obstruction

• Speed of onset and degree of symptoms depend on anatomical site of obstruction (small versus large bowel)
  – Most significant danger is perforation of bowel with generalized peritonitis and sepsis
Bowel Obstruction

• Abdominal pain
  – Dehydration may result from vomiting, decreased intestinal absorption, fluid loss into lumen and interstitium (bowel wall edema)
  – As affected portion of bowel distends, its blood supply is decreased and segment becomes ischemic
  – Wall is weakened and perforates, producing peritonitis
  – If intestine becomes strangulated, blood or plasma also may be lost from affected intestinal segment

Bowel Obstruction

• Definitive care
  – Fluid replacement
  – Antibiotics
  – Placement of a nasogastric tube for decompression
  – Frequently surgery to correct obstructing lesion

Have you ever responded to a call for “constipation”? Did the paramedics consider this diagnosis a possibility? What was the attitude toward the patient?
Crohn’s Disease

- Chronic, inflammatory bowel disease that usually affects ileum, colon, or both structures
  - May occur in persons of all ages, primarily in young adult
  - Autoimmune origin
  - Tends to run in families and in certain ethnic groups
  - Over 20,000 cases reported annually in U.S.

Crohn’s Disease

- Inflammation may cause blockage of intestine
- Blockage occurs because disease tends to thicken intestinal wall with swelling and scar tissue, narrowing passage
- May cause ulcers that tunnel through affected area into surrounding tissues such as bladder, vagina, or skin

Crohn’s Disease

- Areas around anus and rectum often involved
- Complications
  - Tunnels, called fistulae, often become infected
  - Arthritis
  - Skin problems
  - Inflammation in eyes or mouth
  - Kidney stones
  - Gallstones
  - Other diseases of liver and biliary system
Crohn’s Disease

- Characterized by
  - Frequent attacks of diarrhea
  - Severe abdominal pain
  - Nausea
  - Fever
  - Chills
  - Weakness
  - Anorexia
  - Weight loss

Crohn’s Disease

- Suspect disease in any patient with chronic inflammatory colitis and history of rectal fistulae or abscesses
  - Patients frequently hospitalized
  - Once patients are stabilized, condition may be managed with antibiotics, steroids, anti-motility agents to attempt to induce remission, diet regulation

Pancreatitis

- Pancreas lies behind stomach
  - Secretes digestive enzymes into duodenum to help break down food into small molecules
  - Small molecules can be absorbed by body
  - Secretes insulin and glucagon into bloodstream
    - Hormones help to maintain adequate glucose concentration
Pancreatitis

- Pancreas lies behind stomach
  - When pancreas becomes inflamed (pancreatitis), releases pancreatic enzymes into blood, pancreatic duct, and pancreas itself
  - Causes further inflammation and autodigestion of gland
  - Pancreatitis occurs in two stages: acute and chronic

Pancreatitis

- Acute pancreatitis occurs suddenly
  - Soon after pancreas becomes damaged or irritated by its own enzymes
  - Usually results from obstruction by gallstones in bile duct or by alcohol abuse
  - Less common causes
    - Acute pancreatitis include elevated serum lipids
    - Thromboembolism
    - Drug toxicity
    - Infection
    - Some surgeries

Pancreatitis

- Chronic pancreatitis begins as acute pancreatitis
  - Becomes chronic when pancreas becomes scarred
    - Usually results from long-term and excessive alcohol consumption
  - May develop from other causes of pancreatitis
  - Can lead to exocrine and endocrine failure
  - Rarely pancreatitis leads to pancreatic cancer
Pancreatitis

- Symptoms
  - Nausea, vomiting
  - Abdominal tenderness and distention
  - Abdominal pain described as severe, radiating from midumbilicus to patient's back and shoulders
  - In severe cases
    - Fever
    - Tachycardia
    - Signs of generalized sepsis and shock
    - Hospitalization

Pancreatitis

- Treatment
  - IV fluids
  - Pain medication
  - Placement of nasogastric tube if patient is vomiting

Esophagogastric Varices

- Complex of longitudinal, tortuous veins at lower end of esophagus that become large and swollen as result of portal hypertension
  - Common in patients with liver disease and often result from portal hypertension caused by cirrhosis of liver
  - Obstruction to blood flow in liver, produced by fibrosis in liver, increases pressure
  - Obstruction also dilates vessels that drain into liver
Esophagogastric Varices

- Subsequent dilation of thin-walled veins around lower esophagus and upper end of stomach produces esophagogastric varices
  - Varices can rupture
    - Results in life-threatening hemorrhage

Esophagogastric Varices

- Esophageal bleeding causes
  - Esophagitis
    - Associated with chronic use of alcohol and anti-inflammatory nonsteroidal medications
  - Malignancy
  - Episodes of prolonged, violent vomiting that produces tear or laceration in mucosa of upper esophagus (Mallory-Weiss syndrome)
Esophagogastric Varices

• Clinically, patient with esophageal bleeding has bright red hematemesis
  – May be severe
  – If bleeding profuse, melena may be evident
  – Patient may manifest classic signs of shock
  – Variceal bleeding usually is massive and difficult to control
  – Therapeutic intervention includes ensuring patent airway and fluid resuscitation
    • Placement of nasogastric tube for gastric lavage is controversial

Esophagogastric Varices

• Definitive care
  – Placement of Sengstaken-Blakemore tube to tamponade bleeding vessels
  – Surgical ligation of bleeding varices
  – Transendoscopic injection of sclerosing agent into bleeding vessels

Hemorrhoids

• Swollen, distended veins inside anus (internal) or under skin around anus (external)
  – Common during pregnancy (result from fetal pressure in abdomen and hormonal changes that cause hemorrhoidal vessels to enlarge)
  – Present in 50 percent of all persons by age 50
  – Irritation of distended veins made worse by straining during bowel movements and by rubbing or cleaning around anus, which may produce itching, bleeding, or both
  – Symptoms subside within few days
Hemorrhoids

• Pain infrequent unless thrombosis, ulceration, or infection is present
  – Slight bleeding is most common symptom
  • Usually occurs during or after defecation
  • Blood dripping into toilet after defecation or blood-streaked toilet tissue after wiping are common indications
  • Blood loss usually slight
  • Recurrent episodes of bleeding may be significant enough to produce anemia

Hemorrhoids

• Definitive care
  – Diet modification
  – Stool softeners
  – Tissue fixation techniques
  – Operative hemorrhoidectomy for severe cases

Cholecystitis

• Inflammation of gallbladder
  – Disease is common in U.S.
  – Occurs in 15 to 20 percent of population
  – More common in women 30 to 50 years of age than in men
  – Becomes more common with age in both sexes
Cholecystitis

• Risk factors
  – Female sex
  – Oral contraceptive use
  – Increasing age
  – Obesity
  – Diabetes mellitus
  – Chronic alcohol ingestion
  – African American or Asian ethnicity
  – May be chronic with recurrent subacute symptoms or acute because of gallstone obstruction

Cholecystitis

• In 90 percent of cases, caused by gallstones (composed mainly of cholesterol) in gallbladder
  – On occasion totally obstruct neck or cystic duct of gallbladder
    • Leads to common bile duct that empties into small intestine
  – Trapped bile becomes concentrated
    • Causes irritation and pressure buildup in gallbladder
    • Can lead to bacterial infection and perforation

Cholecystitis

• Increased pressure causes sudden onset of pain (biliary colic)
  – Radiates to right upper quadrant or right scapula
  – Commonly have pain episodes at night
  – Associated with recent ingestion of fried or fatty foods
  – Other causes
    • Severe illness
    • Alcohol abuse
    • Tumors of gallbladder
Cholecystitis

• Other associated hallmarks
  - Previous episodes
  - Family history of gallbladder disease
  - Low-grade fever
  - Nausea
  - Vomiting that may be bile stained and described as bitter (variable)
  - Pain and tenderness on palpation in right upper quadrant

Cholecystitis

• Passage of stones into common bile duct with subsequent obstruction may cause
  - Shaking chills
  - High fever
  - Jaundice
  - Acute pancreatitis

Cholecystitis

• Treatment
  - Hospitalization
  - IV fluid therapy
  - Antibiotics
  - Placement of a nasogastric tube
• Definitive treatment
  - Surgical removal of gallbladder
Acute Hepatitis

- Inflammation of liver
- Single most important cause of liver disease in
- Acute hepatitis
  - Associated with
    - Sudden onset of malaise
    - Weakness
    - Anorexia
    - Intermittent nausea and vomiting
    - Dull right upper quadrant pain

Acute Hepatitis

- Three classes of viruses that are of main concern as causes of acute infectious hepatitis
  - Hepatitis A virus
  - Hepatitis B virus
  - Hepatitis C virus, formerly known as non-A/non-B hepatitis virus

Acute Hepatitis

- All types produce similar pathological changes in liver
  - Stimulate antibody response specific to type of virus causing disease
- Many hepatitis infections are subclinical
  - Often present as influenza-like symptoms
Acute Hepatitis

• Serious condition
  – Cirrhosis (scarring of liver)
  – Hepatic encephalopathy (brain and nervous system damage that occurs as a complication of liver disease)
  – Liver cancer

• Inflammation of hepatitis causes
  – Alcohol or other drug use
  – Autoimmune disorders
  – Toxic bacterial, fungal, parasitic, and viral infections
• Require physician’s evaluation and care
Acute Hepatitis

• Proper immunization of paramedics against hepatitis A and B is important
• Observation of body substance isolation procedures also crucial when paramedics are caring for these patients

Hereditary Hemochromatosis

• One of most common genetic disorders in U.S.
  – Inherited condition in which body absorbs and stores too much iron
  • Extra iron accumulates in several organs, especially the liver, heart, pancreas
  – Many people have no symptoms, even in advanced stages
  • Joint pain is most common complaint

Hereditary Hemochromatosis

• Common symptoms
  – Fatigue
  – Abdominal pain
  – Decreased libido
  – Heart problems
Hereditary Hemochromatosis

• Symptoms tend to occur in men between the ages of 30 and 50 and women over age 50
• If not detected early and treated by ridding body of excess iron with regular phlebotomy, serious illness (including death) may result

Hereditary Hemochromatosis

• Systemic illnesses that develop from hemochromatosis include
  – Arthritis
  – Liver disease, including an enlarged liver, cirrhosis, cancer, liver failure
  – Damage to pancreas, possibly causing diabetes
  – Heart abnormalities, such as irregular heart rhythms or congestive heart failure
  – Impotence

Hereditary Hemochromatosis

• Systemic illnesses that develop from hemochromatosis include
  – Early menopause
  – Abnormal pigmentation of skin, making it look gray or bronze
  – Pituitary damage
  – Damage to the adrenal gland
Hereditary Hemochromatosis

- Defective gene must be inherited from both parents in order to develop disease
  - Those who inherit defective gene from only one parent usually do not develop it
  - Siblings of people who have disease should have their blood tested to see if they have disease or are carriers
  - Parents, children, other close relatives of people who have disease should consider being tested

Age-Related Variations in Abdominal Pain

- Many physiological and anatomical differences between infant, child, and adult patients
  - Abdominal pain may also be quite different
  - Example
    - Causes of abdominal pain in elderly are more likely to require surgical treatment
    - Infants and young children are unable to communicate their history or degree of pain
    - As result, can become dehydrated and septic more quickly than adults
    - Vital signs in these groups often do not accurately reflect their degree of illness

Why do you think someone would refuse the opportunity to be vaccinated against this deadly disease (hepatitis)?
Summary

• Major organs associated with the GI system include the esophagus, stomach, small and large intestines, liver, gallbladder, and pancreas
• After scene survey and primary assessment of patient with abdominal pain, obtain a thorough history
  – Physical examination may help to determine whether pain is visceral, somatic, or referred

Summary

• Type and location of pain may help to narrow differential diagnosis
• Important signs and symptoms associated with abdominal pain include nausea, vomiting and anorexia, diarrhea, constipation, stool color and fever

Summary

• Most common treatment for abdominal pain occurs at the hospital
  – Paramedic should provide supportive treatment, manage life threats, and transport the patient to an appropriate facility
Summary

- Gastrointestinal bleeding can be slow and chronic or rapid and life-threatening
  - Causes of GI bleeding include esophagogastric varices, Mallory-Weiss syndrome, cancer, medication use, and other systemic disease
- Gastroenteritis is inflammation of the stomach and intestines caused by infectious agents, chemicals, or other conditions

Summary

- Gastritis is acute or chronic inflammation of gastric mucosa
  - Commonly results from hyperacidity, alcohol or other drug ingestion, bile reflux, and H. pylori infection
- Ulcerative colitis is an inflammatory condition of the large intestine
  - Colitis is characterized by severe diarrhea and ulceration of the mucosa of the intestine (ulcerative colitis)

Summary

- Diverticulosis may result in bright red rectal bleeding if perforation occurs
- Diverticulitis results when a diverticulum becomes obstructed with fecal matter
- Appendicitis occurs when passageway between appendix and cecum is obstructed by fecal material or by inflammation caused by infection
Summary

• Peptic ulcer disease occurs when open wounds or sores develop in stomach or duodenum
• Bowel obstruction is an occlusion of the intestinal lumen
  — Results in blockage of normal flow of intestinal contents
• Crohn’s disease is a chronic, inflammatory bowel disease
  — Unknown origin

Summary

• Inflammation of pancreas is called pancreatitis
  — It causes severe abdominal pain
• Esophagogastric varices result from obstruction of blood flow to the liver as a result of liver disease
  — Rupture of varices can cause hemorrhage and death
• Hemorrhoids are distended veins in rectoanal area

Summary

• Cholecystitis is inflammation of gallbladder
  — It most often is associated with presence of gallstones
• Hepatitis is characterized by sudden onset of malaise, weakness, anorexia, intermittent nausea and vomiting, and dull right upper quadrant pain
  — Usually are followed within 1 week by onset of jaundice, dark urine, or both
Summary

• Hereditary hemochromatosis is a condition in which the body absorbs and stores too much iron
  – Can cause severe damage when it collects in the liver, heart, and pancreas

Questions?