Review of the Diseases of the Lower GI Tract

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Continuing Medical Education
Disclosure Statement

Dr. Weismiller has nothing to disclose.

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Learning Objectives

1. Discuss the diagnosis and treatment of irritable bowel syndrome.
2. Recognize the common forms of malabsorption.
3. Review the diagnosis and treatment of cancer of the small intestine, large intestine, and anus.
4. Summarize other clinical entities of the lower GI tract, including constipation and infections.
1. A 20-year-old college student comes to student health services to discuss her multi-year history of abdominal pain and constipation. It has gotten worse since she returned to school this fall. She describes crampy pain and bloating that eases after defecation. Her bowel movements are firm and difficult to pass, and occur about every 4 days on average. She denies vomiting, weight loss, blood in the stool, or melena. Her menses are regular and she is otherwise healthy. Her family history is negative for any gastrointestinal or genitourinary diseases. Her abdominal examination is normal. You diagnose her with irritable bowel syndrome. Which ONE of the following would be most appropriate at this time?

A. A therapeutic trial of increased soluble fiber intake
B. A therapeutic trial of lubiprostone (Amitiza)
C. Abdominal ultrasonography
D. Abdominal CT
E. Colonoscopy
1. A 20-year-old college student comes to student health services to discuss her multi-year history of abdominal pain and constipation. It has gotten worse since she returned to school this fall. She describes crampy pain and bloating that eases after defecation. Her bowel movements are firm and difficult to pass, and occur about every 4 days on average. She denies vomiting, weight loss, blood in the stool, or melena. Her menses are regular and she is otherwise healthy. Her family history is negative for any gastrointestinal or genitourinary diseases. Her abdominal examination is normal. You diagnose her with irritable bowel syndrome. **Which ONE of the following would be most appropriate at this time?**

81%  
**B. A therapeutic trial of lubiprostone (Amitiza)**

16%  
C. Abdominal ultrasonography

0%  
D. Abdominal CT

1%  
E. Colonoscopy
Irritable Bowel Syndrome

• Defined
  – GI syndrome characterized by altered bowel habits and abdominal pain, in the absence of detectable structural abnormalities
  – Prevalence
    • 10%-15% in North America
Irritable Bowel Syndrome

**Clinical Features**

- **Patterns**
  - 80% diarrhea + constipation + pain
  - 20% painless diarrhea only
- **Altered bowel habits**
  - Alternation of diarrhea with constipation
    - Usually beginning in adult life, one usually predominant
    - Usually, constipation begins as episodic, later becomes constant
    - Evacuation usually feels incomplete
    - No nocturnal diarrhea
    - Worse with stress
Additional Clinical Features

• Abdominal pain
  – Episodic and cramping, highly variable; rarely interferes with sleep

• Gas and flatulence
  – C/o distention, increased belching, increased flatulence (objective measurements are normal)

• Upper GI symptoms
  – 25%-50% c/o dyspepsia, heartburn, nausea, vomiting
Irritable Bowel Syndrome

Diagnosis

- Not purely a diagnosis of exclusion
- Careful H&P
  - Timing and pattern of pain
  - Targeted testing when no alarm symptoms
- All patients
  - CBC, chemistry panel
- If diarrhea predominant
  - TSH, stool for O&P, 24 h stool occasionally helpful
- If > 40 at onset
  - Consider flex sig, BE, or colonoscopy to r/o cancer
  - If younger, consider endoscopy to rule out inflammatory bowel disease
- If mostly diarrhea
  - R/o lactase deficiency, sorbitol excess, celiac disease
- If mainly upper GI symptoms
  - Consider EGD
Irritable Bowel Syndrome

Pathophysiology

- Remains uncertain
- Heredity and environmental factors play a potential role.
- Abnormal myoelectric activity
  - Basal rhythm 3 cycles/min in IBS (6 cycles/min is normal)
- Visceral afferent hypersensitivity
- Microscopic mucosal inflammation
- Psychosocial dysfunction
In Our Case...

- Patient’s symptoms are consistent with irritable bowel syndrome (IBS).
- History, physical examination, and laboratory evaluation did not show any evidence of peptic ulcer disease, celiac disease, thyroid disease, or inflammatory bowel disease.

No red flags
- Unintentional and unexplained weight loss
- Rectal bleeding
- Family history of bowel or ovarian cancer
- Change in bowel habits persisting MORE than 6 weeks in a person > 60

The patient does not have any of these findings and therefore does not require any additional testing to confirm the diagnosis of IBS.
Irritable Bowel Syndrome

**Treatment**

- Self-help, patient education, cognitive behavioral treatment
- Dietary changes, when indicated, insoluble fiber – may be helpful, powerful GI tract stimulant
  - High-fiber diet, bran
- **Soluble fiber (eg, psyllium)** – NOT EFFECTIVE
- Lubiprostone is effective for constipation-predominant IBS.
  - Works by increasing the amount of fluid in intestine, making it easier for stool to pass
- Antispasmodics
  - Dicyclomine, tincture of belladonna, hyoscyamine
- Antidepressants
  - Low dose: Analgesia, mood, colonic transit slowing
- Antidiarrheal agents
  - Diphenoxylate, loperamide; no help with pain

IBS Treatments

Evidence-Based Recommendations

• Lubiprostone is effective for constipation-predominant IBS (SOR B).
• Antidepressant treatment of pain-predominant IBS
  – TCAs (SOR B)
  – SSRIs (insufficient data)
• Psychologic treatment
  – Hypnotherapy (SOR B)
  – Cognitive-behavioral therapy (SOR B)
Malabsorption

- Defined
  - Impaired absorption of nutrients

- Clinical features
  - Symptoms (consistent across types)
    - Weight loss
    - Diarrhea
    - Bloating and flatulence
    - Malnutrition
Classification of Malabsorptive Disorders

- Luminal disorders
  - Hepatobiliary disease
  - Pancreatic insufficiency
  - Altered bacterial flora
    - Jejunal diverticulosis
    - Blind-loop syndrome
    - Scleroderma
- Jejunal diverticulosis
- Blind-loop syndrome
- Scleroderma
- Mucosal abnormalities
  - “Structural”
    - Celiac disease (sprue)
    - Tropical sprue
    - Radiation Enteritis
    - Agammaglobulinemia
  - “Biochemical”
    - Abetalipoproteinemia
    - Amino acid absorptive disorders
- Wall disease
  - Regional enteritis
  - Amyloid disease
- Vascular disease
  - Mesenteric artery disease
  - Cardiac failure
- Metabolic disorders
  - Pancreatic adenoma
  - Carcinoid
  - Hypopituitarism
  - Carcinoma of the bronchus
- Lymphatic abnormalities
  - Whipple’s disease
  - Lymphangiectasia
  - Lymphoma
- Iatrogenic causes
  - Surgery and drugs

Malabsorption

Physical Findings

- Pallor, anemia
- Muscle wasting
- Hair loss
- Edema
- Pagophagia (ice pica)
- Amenorrhea
- Paresthesias
- Glossitis
- Cheilitis
- Bruising
Malabsorption

**Diagnostic Tests**

- Decrease in serum carotene, cholesterol, albumin
- Quantitative or qualitative fecal fat
- Carbon 14 triolein breath test
  - Decrease CO₂ fat malabsorption
- Small intestine films and biopsy
- Cultures from small intestine
- Breath hydrogen tests (for bacterial overgrowth)
- General therapy for malabsorption is nutritional.
Common Syndromes

Maldigestive and Malabsorptive

• Exocrine pancreatic insufficiency
  – Dx: Steatorrhea + normal D-xylose (no proximal small bowel dysfunction)
  – Tx: Pancreatic enzyme replacement
• Bile acid deficiency – short gut
• Parasitic diseases
  – Giardiasis
  – Cryptosporidium
• Immunodeficiency states
• Lactase deficiency
  – Dx: Breath hydrogen lactose challenge
  – Tx: Diet
2. A 19-year-old patient presents to your office for follow-up. She reports continued intermittent abdominal cramping and bloating, diarrhea, fatigue, and a 4.5-kg weight loss. She initially was diagnosed with irritable bowel syndrome, but you suspect celiac disease. Which one of the following should be used to establish the diagnosis?

A. Colonoscopy
B. Serologic testing
C. Serologic testing initially, followed by endoscopy if test results are positive
D. Serologic testing initially, followed by colonoscopy
E. Clinical impression is sufficient.
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B. Serologic testing
C. Serologic testing initially, followed by endoscopy if test results are positive
D. Serologic testing initially, followed by colonoscopy
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Celiac Sprue

- Chronic intestinal malabsorption disorder
  - Intolerance to the gliadin fraction of gluten in wheat
- Features
  - Flat jejunal mucosa with clinical and/or histologic improvement following withdrawal of dietary gluten
Celiac Sprue

• **Symptoms and signs**
  – No typical presentation
  – May be asymptomatic
  – Steatorrhea common
  – Failure to thrive
  – Anemia
  – Symptoms of various deficiency states
  – Bone loss
  – Arthritis
  – Neuropsychiatric disease

• **Laboratory**
  – Fe deficiency anemia in children
  – Adults
    • Iron deficiency
    • Folate deficiency
    • Vitamin D deficiency
Celiac Disease

**Diagnosis**

- Several serologic tests are readily available for diagnosis.
  - Endomysial antibody* (sensitivity 81%, specificity 97%)
  - IgA anti-tissue transglutaminase antibody* (sensitivity 79%-90%, specificity 98%)
  - Deamidated gliadin peptide antibody (IgG/IgA) (sensitivity 95%-98%)
- No one test has been demonstrated in clinical studies to be more accurate than another.
- Test while consuming a diet of gluten-containing foods.
- Gold standard: Histologic assessment of multiple proximal small intestinal mucosal biopsies – villous atrophy

* AGA recommends these tests as initial serologic testing in adults.
Celiac Disease

*Treatment*

- Gluten avoidance
3. Inflammatory bowel disease is characterized by which of the following?

A. Men are affected more often than women.
B. Older children tend to be most often affected.
C. An association with an infection with *Giardia*.
D. An immune role as mediator of tissue injury in the disorder.
3. Inflammatory bowel disease is characterized by which of the following?

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C. An association with an infection with *Giardia*.  
D. An immune role as mediator of tissue injury in the disorder

- A: 8%
- B: 3%
- C: 2%
- D: 87%
Inflammatory Bowel Disease

• Onset
  – Usually young adults
  – Affects men and women equally
  – More common among Caucasians in N. America and N. Europe

• Ulcerative colitis
• Crohn’s disease
Inflammatory Bowel Disease

• Spectrum
  – Crohn’s, indeterminate, ulcerative colitis
  – 600,000 people in the US have some form of inflammatory bowel disease.

• Pathogenesis
  – Some genetic role
  – No identified infectious agent
  – Strong evidence for immune role as mediator of tissue injury – unknown trigger
  – Serologic markers (ASCA, G0F/G2F, etc)
Ulcerative Colitis

- Incidence: 10/100,000, 25% family history
- Pathology
  - CONFINED TO MUCOSA
  - Starts in rectum, moves proximally WITHOUT skips
- Clinical features
  - Mild to severe at start
  - Abrupt onset
  - Rectal bleeding, diarrhea, fever, cramping pain, weight loss
## Differential Diagnosis of Ulcerative Colitis and Recommended Testing

<table>
<thead>
<tr>
<th>Disease</th>
<th>Findings that suggest diagnosis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amebic dysentery</td>
<td>Travel to endemic areas or exposure to illness</td>
<td>Anti-amebiasis antibodies, microscopy (O&amp;P)</td>
</tr>
<tr>
<td>Bacterial colitis</td>
<td>Should be routinely considered; exposure history may increase suspicion</td>
<td>Stool culture, including testing for <em>E. coli</em> 0157:H7</td>
</tr>
<tr>
<td><em>Clostridium difficile</em> infection</td>
<td>Recent antibiotic use</td>
<td>Stool studies for <em>C. difficile</em> toxin</td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>Increased suspicion with disease not limited to colon</td>
<td>Endoscopic biopsy</td>
</tr>
<tr>
<td>Ischemic colitis</td>
<td>Risk factors for vascular disease</td>
<td>Endoscopic biopsy</td>
</tr>
<tr>
<td>Microscopic colitis</td>
<td>Nonbloody stools</td>
<td>Endoscopic biopsy</td>
</tr>
<tr>
<td>Viral or parasite-induced colitis</td>
<td>Immunocompromised</td>
<td>Endoscopic biopsy</td>
</tr>
<tr>
<td>Medication</td>
<td>Dosage for active disease</td>
<td>Maintenance dosage</td>
</tr>
<tr>
<td>---------------------</td>
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</tr>
<tr>
<td>Sulfasalazine</td>
<td>4-6 g/day divided QID</td>
<td>2-4 g/day</td>
</tr>
<tr>
<td>5-Aminosalicylic acid Oral Suppository Enema</td>
<td>2-4.8 g/d, divided TID 1000 mg/d 1-4g/d</td>
<td>1.2-2.4 g/d 500 mg 1-2x/d 2-4g daily to every third day</td>
</tr>
<tr>
<td>Hydrocortisone Enema Foam</td>
<td>100 mg 90 mg 1-2X/d</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Prednisone</td>
<td>40-60 mg/d until clinical improvement, then taper 5-10 mg/w 40-60 mg/d</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>Not recommended</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Infliximab (Remicade)</td>
<td>5-10 mg/kg weeks 0, 2, and 6</td>
<td>5-10 mg/kg q 4-8 weeks</td>
</tr>
<tr>
<td>Azathioprine (Imuran)</td>
<td>Not recommended</td>
<td>1.5-2.5 mg/kg/d</td>
</tr>
<tr>
<td>Cyclosporine</td>
<td>2-4 mg/kg/d</td>
<td>Not recommended</td>
</tr>
</tbody>
</table>
# Ulcerative Colitis – SORT: Key Recommendations for Practice

<table>
<thead>
<tr>
<th>Clinical recommendation</th>
<th>Evidence rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-aminosalicylic acid is highly effective for inducing remission and preventing relapse.</td>
<td>A</td>
</tr>
<tr>
<td>Oral corticosteroids are effective for inducing remission.</td>
<td>B</td>
</tr>
<tr>
<td>Remicade is effective for inducing remission in corticosteroid-refractory UC.</td>
<td>A</td>
</tr>
<tr>
<td>Imuran is effective for preventing relapse.</td>
<td>B</td>
</tr>
<tr>
<td>Probiotics <em>Lactobacillus</em> GG and <em>E. coli</em> Nissle 1917 (Mutaflor) are as effective as 5-ASA in maintaining remission.</td>
<td>B</td>
</tr>
</tbody>
</table>

Ulcerative Colitis

*Link with Colon Cancer*

- 2.8-15x as likely to develop colon cancer
- Colonoscopy q 1-2 years* [SOR: C]
  - Initiated 8-10 years after UC is diagnosed

**Crohn’s Disease**

- **Pathology**
  - FULL WALL THICKNESS
  - Any part of GI tract may be affected.
  - Terminal ileum most common site
  - SKIPS

- **Clinical features**
  - Insidious onset
  - Commonly with mild diarrhea and pain

- **Diagnosis**
  - Cultures
  - O&P
  - Biopsy
  - Colonoscopy
  - Radiographs
4. Possible treatments for Crohn’s disease include all of the following EXCEPT:

A. Steroids
B. Aspirin
C. Cyclosporine
D. Sulfasalazine
4. Possible treatments for Crohn’s disease include all of the following EXCEPT:

A. Steroids
B. Aspirin
C. Cyclosporine
D. Sulfasalazine
Crohn’s Disease

• Treatment*
  – Patient education and support
  – Sulfasalazine and 5-ASA
  – Steroids
  – Immunosuppressants
    • 6-MP
    • Azathioprine
    • Methotrexate
    • Cyclosporine
  – Antibiotics
    • Metronidazole for rectal fistulas
  – Anti-tumor necrosis factor agents (biologics), eg, Infliximab
  – Steroids, eg, Budesonide
  – Surgery


Similar cancer risk as UC after long-standing disease – similar screening recommendation and controversy*
# Crohn’s - SORT:

**Key Recommendations for Practice**

<table>
<thead>
<tr>
<th>Clinical Recommendation</th>
<th>Evidence rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultrasonography, CT, scintigraphy, and MRI are helpful for excluding extramural complications</td>
<td>C</td>
</tr>
<tr>
<td>Colonoscopy with ileoscopy and biopsy is a valuable initial test in diagnosis of ileocolonic Crohn’s disease</td>
<td>C</td>
</tr>
<tr>
<td>EGD is recommended if patients have upper GI symptoms</td>
<td>C</td>
</tr>
<tr>
<td>No difference between elemental and nonelemental diets in inducing remission in patients with Crohn’s disease</td>
<td>A</td>
</tr>
<tr>
<td>Budesonide is effective in inducing, but not maintaining, remission</td>
<td>B</td>
</tr>
<tr>
<td>Corticosteroids are more effective than placebo and 5-ASA products in inducing remission</td>
<td>A</td>
</tr>
<tr>
<td>Azathioprine and 6-MP are effective in inducing remission in patients with active disease</td>
<td>A</td>
</tr>
<tr>
<td>Methotrexate is effective in inducing and maintaining remission</td>
<td>B</td>
</tr>
</tbody>
</table>
GI Infections
Common GI Infections

• Goals
  – Replace the fluid lost through diarrhea and vomiting.
  – Identify and eradicate the causative agent.

• Diagnosis
  – History: Work, travel, eating, others ill, recent antibiotics, immunocompromised, HIV
  – Vomiting implies gastric involvement with preformed toxin.
  – Pain implies distention and inflammation.
  – Lab: Stool for fecal blood and leukocytes, cultures, O&P*
  – Sigmoidoscopy

* Most acute diarrhea is viral and self-limited. Order O&P if history of travel or diarrhea is chronic.
Rehydration Recommendations

• Oral rehydration therapy (ORT)
  – Recommended by the AAP as “the preferred treatment of fluid and electrolyte losses caused by diarrhea in children with mild to moderate dehydration.”
  – WHO reduced-osmolarity oral rehydration solution (ORS) now recommended for all rehydration in children, both cholera-endemic areas and non-cholera endemic.
  – Pedialyte, Rehydrolyte, Ceralyte, Infalyte
  – Sports drinks, diluted fruit juices, watery soups (adults)

• Intravenous therapy
  – Parenteral saline and electrolytes
  – Ringer’s lactate

• Dietary adjustments (following rehydration)
  – Boiled vegetables, starches, soups, yogurt
  – Avoid high fat.
  – Simple sugars as opposed to complex carbohydrates

5. Which of the following is the most common cause of infectious diarrhea in children both in developed and developing countries?

A. Campylobacter  
B. Rotavirus  
C. Shigella  
D. Norovirus
5. Which of the following is the most common cause of infectious diarrhea in children both in developed and developing countries?

A. Campylobacter
B. Rotavirus
C. Shigella
D. Norovirus

Correct answer: B. Rotavirus
Common GI Infections

- Rotavirus
- Norovirus
- Campylobacter
- Salmonellosis
- Shigella
- Amebiasis
- Giardiasis
- Cryptosporidium

- Pseudomembranous enterocolitis
- Traveler’s diarrhea
- Vibrio cholerae
(Viral) Gastroenteritis

Majority of Gastroenteritis Is Viral

- Rotavirus
- Norovirus
- Adenovirus
- Astrovirus

- Rotavirus is the most common cause in children and produces similar incidence rates in both the developed and developing world.
- Norovirus is the leading cause of gastroenteritis among adults in America, causing greater than 90% of outbreaks.
Rotavirus

• Most important viral cause of severe gastroenteritis in children worldwide
  – Most common cause in US
  – Large-volume diarrhea without blood or leukocytes in stool
  – Daycare centers – fecal oral spread

• Dx: Immune-based assays of stool, PCR

• Complications: Necrotizing enteritis, biliary atresia, intussusception, chronic diarrhea
Rotavirus

• Treatment is generally supportive.
• Immunization (SOR A)
  – CDC/AAP recommend universal immunization in US with oral PRV vaccine.
  • 2 months
    – First dose minimum 6 weeks, maximum < 15 weeks
  • 4 months
  • 6 months
    – Must complete by 8 months
Norovirus

• Norovirus is the leading cause of gastroenteritis among adults in America, causing greater than 90% of outbreaks.
  – Top pathogen contributing to domestically acquired foodborne illness
  – Second most common foodborne illness resulting in hospitalization
  – Fourth in terms of domestically acquired foodborne illness resulting in death
6. Which of the following organisms is the most common cause of **bacterial** diarrhea in adults in the USA?

A. Salmonella
B. Shigella
C. *E. coli* 0157:H7
D. Campylobacter
6. Which of the following organisms is the most common cause of **bacterial** diarrhea in adults in the USA?

- A. Salmonella (24%)
- B. Shigella (9%)
- C. *E. coli* 0157:H7 (26%)
- D. Campylobacter (41% ✔)
Bacterial Gastroenteritis

Adults
• Campylobacter

Children
• *E. coli*
• Salmonella
• Shigella
Campylobacter

- 10%-15% of US acute diarrhea
- Animal reservoir
  - Most human cases are contaminated poultry (~50%)
- Severe cramps, **bloody diarrhea**, anorexia, malaise; rarely, Guillain-Barre, reactive arthritis
- Diagnosis: Culture
- Treatment
  - Spontaneous clearing without antibiotics or
  - Erythromycin if culture proven
  - FQ > resistance
Shigella

- Bloody diarrhea
- Fecal oral spread
  - Highly contagious
- Principal effect on colon mucosa
  - Low-volume diarrhea
  - Blood
  - Mucus
  - Fever
  - Tenesmus
- Diagnosis
  - Culture
Shigella

• Clinical
  – Self-limiting
  – Rarely
    • Rectal prolapse, proctitis, toxic megacolon, perforation, obstruction, seizures in children, HUS

• Treatment
  – TMP-SMX (children)
  – Quinolone
  – Fluids
  – No vaccine
Salmonellosis

• 10%-15% of US acute diarrhea
  – Second leading cause of acquired foodborne illness in US
  – Top pathogen of domestically acquired foodborne illness
    resulting in hospitalization and in death

• Non-typhoidal starts 6-48 hours after exposure, resolves spontaneously
  – Vomiting
  – Nausea
  – Pain
  – Diarrhea

• Sources
  – Eggs and poultry
  – Pet reptiles
Salmonellosis

- Clinical
  - Self-limited
  - Can cause bacteremia
    - Endocarditis
    - Osteomyelitis
    - Mycotic aneurysm

- Typhoid via fecal-oral contamination, rare in US
  - Constipation and rash early, then diarrhea and pain
  - Diagnosis
    - Culture from blood or stool
  - Treat
    - Fluoroquinolone
    - Vaccine available
E. coli 0157:H7 (EHEC)

- Sporadic and large outbreaks
  - Produces Shiga toxin
  - Diagnose with culture.
- Clinical
  - Dysentery
  - Striking abdominal pain
  - Usually no fever
E. coli 0157:H7 (EHEC)

• Complication
  – Hemolytic uremic syndrome

• Source
  – Contaminated meat

• Treatment
  – Supportive
  – Antibiotic NOT indicated
## Foodborne Illness Summary

<table>
<thead>
<tr>
<th>Pathogen (top 5 domestically acquired foodborne illnesses)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norovirus</td>
<td>58</td>
</tr>
<tr>
<td><em>Salmonella</em> (nontyphoidal)</td>
<td>11</td>
</tr>
<tr>
<td><em>Clostridium perfringens</em></td>
<td>10</td>
</tr>
<tr>
<td><em>Campylobacter</em> spp</td>
<td>9</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>3</td>
</tr>
</tbody>
</table>

Last updated June 21, 2013
Amebiasis

- 5% reported US carriage rate
- *E. histolytica* mostly
  - Fecal-oral spread
  - Abdominal cramps
  - Chills, fever
  - Liquid BMs with bloody mucus

- **Diagnosis**
  - Sigmoidoscopy
  - O&P
  - Stool/serum antigen
  - Serology

- **Treatment**
  - Metronidazole etc.
Giardiasis

- **Common**
  - Mostly from contaminated water
- **Symptoms**
  - Abdominal cramps
  - Malabsorption
  - Nausea and vomiting
  - Watery diarrhea
- **Diagnosis**
  - O&P
  - *Giardia* antigen assay
- **Treatment**
  - Metronidazole
7. Of the following antibiotics, which is the agent recommended for treatment of pseudomembranous enterocolitis?

A. Amoxicillin
B. Ciprofloxacin
C. Metronidazole
D. Doxycycline
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A. Amoxicillin
B. Ciprofloxacin
C. Metronidazole
D. Doxycycline

91% C. Metronidazole
Pseudomembranous Enterocolitis

- Common in “post-antibiotic” setting
  - Amoxicillin is most common offending antibiotic.
  - Occurs with most antibiotics
- Etiology
  - Toxin from *Clostridium difficile*
- Diagnosis
  - Cytotoxin assays
  - Immunoassays to toxin
- Treatment
  - Stop antibiotic – use metronidazole or vancomycin
    - No reported resistance
  - Fluids
- Relapse and carrier rates are possible (10%-25%).
**C. difficile in the Elderly**

- **Common** due to frequent exposure to antibiotics
- Toxin titer correlates with illness severity.
- **2007 Treatment Guidelines:** Vancomycin (125 mg po QID) if 2 or more factors:
  - Age > 60
  - Temp > 100.9°F (38.3°C)
  - Cr increased 1.5x baseline
  - Albumin < 2.5
  - WBC > 15,000
Traveler’s Diarrhea

- Multiple causes
  - Enterotoxigenic *E. coli* most common
  - *Campylobacter jejuni*
  - *Shigella* spp
  - *Salmonella* spp

- Prophylaxis
  - **NOT** recommended by CDC
  - Routine prophylaxis increases the traveler’s risk for adverse reactions and for infections with resistant organisms.

- Strict adherence to preventive measures
- Usually self-limited
Traveler’s Diarrhea (TD)

If Treatment Is Needed …

• Travelers who develop ≥ 3 loose stools in an 8-hour period – especially if associated with nausea, vomiting, abdominal cramps, fever, or blood in stools

• Antibiotics*
  – Fluoroquinolones are drugs of choice when needed single dose or 1 day (increasing resistance)
  – Alternative: Azithromycin (500 mg q day for 1-3 days)
  – **NO** trimethoprim-sulfamethoxazole or doxycycline because of high levels of resistance

• Bismuth subsalicylate may also be used for treatment.
  – One fluid oz or two 262 mg tablets q 30 minutes for up to eight doses in a 24-hour period

• **The anti-motility agent loperamide is a well-established antidiarrheal agent.**
  – Its effective and safe use as an adjunct to antibiotics in the treatment of TD has been demonstrated in several studies. No other non-antibiotic treatment for TD has significant guideline or clinical trial support.

Vibrio Cholerae

- In the developing world, especially sub-Saharan Africa and Asia, cholera is a common cause of gastroenteritis.
  - Contaminated water or food
- In US, generally associated with travel
  - Asia
  - China
  - South/Central America
  - OR consumption of contaminated seafood
  - OR recent consumption of contaminated imported foods
- Treatment
  - Vigorous rehydration
  - Doxycycline
Key Learning Points: Diarrhea

- **Rotavirus** is the leading cause of infectious diarrhea in children in the US.
- **Norovirus** is the leading cause of foodborne disease in US and the leading cause of gastroenteritis in US adults.
- **Campylobacter** is the most common cause of bacterial diarrhea in adults in the US.
- Antibiotics are not indicated for treatment of *E. coli 0157:H7*.
- Amoxicillin is most common offending antibiotic for pseudomembranous enterocolitis.
- Prophylaxis for traveler’s diarrhea is NOT recommended.
Diverticulosis

• Symptoms
  – 90% asymptomatic
  – Intermittent LLQ abdominal pain
  – Irregular defecation

• Exam
  – Tender LLQ
  – (−) rectal exam without occult blood

• Diagnosis
  – Flexible sigmoidoscope and barium enema

• Treatment
  – High-fiber diet (unprocessed bran, hydrophilic bulk laxatives)
Diverticulitis

- Clinical presentation
  - Acute lower abdominal pain
  - Fever (usually below 102º F)
  - Tachycardia
- Physical findings
  - Tender lower abdomen, possibly with rebound
    - Tenderness only in the LLQ significantly increases the likelihood of diagnosis ([+] LR = 10.4).
  - Acute abdomen is possible
Diverticulitis

Diagnostic Studies

- CBC: Leukocytosis with “left shift”
  - 55% will have leukocytosis.
- BMP
  - Assess electrolytes and renal function.
- Consider C-reactive protein
  - LLQ tenderness AND a CRP > 50 mg/L, in the absence of vomiting, likelihood of acute diverticulitis significantly increased ([+] LR = 18).
- UA: Sometimes WBC and RBC
- Plain films: Sometimes free air
- US: Sometimes abscess
- CT: Evolving as preferred method
  - Quite a bit of controversy with CT scan regarding the use of contrast agents: Intravenous, oral, or rectal contrast agents versus giving no contrast agents at all, CT KUB.
- AVOID endoscopy and BE in acute setting.
  - Colonoscopy 4-6 weeks post-resolution of symptoms in patients with complicated disease
Diverticulitis

Treatment

• General
  – Depends on severity
  – May require only clear liquids and oral antibiotics
    • Can be done outpatient with follow-up in 2-3 days
    • Ciprofloxacin and/or metronidazole
  – OR MAY NEED (hospitalization)
    • NPO
    • NG suction
    • IV fluids
    • IV antibiotics
      – Ampicillin + aminoglycoside + metronidazole OR
      – Imipenem/cilastatin OR
      – Piperacillin/tazobactam
Diverticulitis

Treatment

• Surgery
  – 15%-30% admitted for acute diverticulitis will need surgical intervention during the admission.
  – For peritonitis, perforation, unresolved obstruction, and colovesical fistula
  – Avoid for uncomplicated diverticulitis

• Bleeding
  – 15%-40%
  – Profuse, painless
  – Generally self-limited

### Clinical Recommendation

<table>
<thead>
<tr>
<th>Clinical Recommendation</th>
<th>Evidence Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics may not be necessary in patients with uncomplicated diverticulitis who are being treated in the outpatient setting.</td>
<td>B</td>
</tr>
<tr>
<td>There is NO clear evidence that avoiding nuts, corn, or popcorn decreases the risk of diverticulosis or diverticular complications, such as diverticulitis.</td>
<td>B</td>
</tr>
</tbody>
</table>

Cancer of Small Intestine

• Rare
  – Most commonly seen in Crohn’s
• Adenocarcinoma: 46%
  – Others: Lymphoma, carcinoid
• Diagnosis
  – Usually imaging study
• Treatment
  – Usually surgery

Colonic Polyps

• Types
  – Adenomas
    • Tubular
    • Villous
    • Tubulovillous
  – Hamartomas
  – Hyperplastic
  – Inflammatory

• Clinical presentation
  – Asymptomatic or
  – Bleeding
  – Rarely
    • Obstruction or intussusception

Colonic Polyps

- Diagnostic studies
  - Endoscopy superior to barium enema
- Treatment
  - Remove during colonoscopy
  - If found during flexible sigmoidoscopic exam: Biopsy AND have patient undergo colonoscopy.
8. All of the following are true regarding colon cancer EXCEPT:

A. 95% of large intestine neoplasms are squamous cell carcinomas.
B. Colon cancer is the second most frequent cause of cancer death in the United States.
C. Colon cancer is equally frequent in men and women.
D. Inflammatory bowel disease predisposes an individual to colon cancer.
8. All of the following are true regarding colon cancer EXCEPT:

A. 95% of large intestine neoplasms are squamous cell carcinomas. [72%]

B. Colon cancer is the second most frequent cause of cancer death in the United States. [10%]

C. Colon cancer is equally frequent in men and women. [8%]

D. Inflammatory bowel disease predisposes an individual to colon cancer. [11%]
Cancer of Large Intestine

• Most frequent internal neoplasm in the US
  – Second most frequent cause of cancer death AFTER lung cancer
  – 5%-6% lifetime risk (1 in 17)
  – More common in Western nations
  – Equal frequency in men and women
  – African Americans and Caucasians equally affected
    • African Americans have a higher mortality
Cancer of Large Intestine

- **Histology**
  - 95% Adenocarcinoma
    - Progression from adenoma (adenomatous polyp) to carcinoma – May take 10 years

- **Polyps**
  - < 1 cm: < 1% chance of CA
  - 1-2 cm: 10%–20% chance of CA
  - > 2 cm: 30%–50% likelihood
  - Detecting and removing polyps early CAN PREVENT much colon cancer.

Source: Emmanuelm@en.wikipedia
Conditions Predisposing to Colon Cancer

- Increasing age
- Family history of colon or rectal cancer or polyps
- Low-fiber (controversial), high-fat diet
- Inflammatory bowel disease
- Genital tract cancer in women
- Adenomatous polyps
- Familial polyposis, HNPCC, Gardner’s syndrome, Turcot syndrome, Peutz-Jeghers syndrome, family cancer syndrome
- Diabetes
- Acromegaly
- Cholecystectomy
- Streptococcus bovis endocarditis
9. According to the **2008 ACS Colorectal Cancer Screening Guidelines**, colon cancer screening should begin at which age?

A. Age 40
B. Age 45
C. Age 50
D. Age 55
9. According to the 2008 ACS Colorectal Cancer Screening Guidelines, colon cancer screening should begin at which age?

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C. Age 50
10. Which of the following is NOT a recommended method of screening for colorectal cancer per the 2008 ACS Colorectal Cancer Screening Guidelines?

A. Annual FOBT with flex sig q 5 years
B. Colonoscopy q 10 years
C. Double-contrast BE q 5-10 years
D. Flex sig q 3 years
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Six Guidelines on Screening for Colorectal Cancer

- AGA* (2008)
- Institute for Clinical Systems Improvement
- USPSTF* (2008)
- American College of Radiology
- American College of Physicians* (2012)
Summary of the 2008 Recommendation of the USPSTF on Screening for Colorectal Cancer

Screening tests

- High sensitivity FOBT, sigmoidoscopy with FOBT, and colonoscopy are effective in decreasing colorectal cancer mortality.
- The risks and benefits of these screening methods vary: Colonoscopy and flexible sigmoidoscopy entail serious complications.

For all populations, evidence is insufficient to assess the benefits and harms of screening with computerized tomography colonography (CTC) and fecal DNA testing.
Algorithm for CRC Screening
AGA, 2008

Men and women → Symptomatic → Diagnostic work-up

Asymptomatic

Age < 50 years

- Negative family history
  - No screening
    - HNPCC* or FAP
      - Genetic counseling
        And special screening

- Positive family history
  - 2 or more first-degree relatives affected*
    Or 1 first-degree relative affected at age < 60 years
    - Colonoscopy beginning age 40 years or
      10 years earlier than the youngest diagnosis**
        in the family, whichever comes first

Age ≥ 50 Years

- Negative family history
  - Avg. risk screening
    - 1 first-degree relative affected at age ≥ 60 years
      - Average-risk screening, but
        beginning at age 40 years

Volume 134, Issue 5; 1570-1595, May 2008

*HNPCC=hereditary nonpolyposis colorectal cancer & FAP=familial adenomatous polyposis
*either colorectal cancer or adenomatous polyp

**either colorectal cancer or adenomatous polyp
Cancer Screening – 2010

• Data from the 2010 National Health Interview Survey
  – Colorectal cancer screening rate 58.6% (Healthy People 2020 target: 70.5%)
  – Other colorectal cancer screening rates
    • No usual source of health care: 20.8%
    • No health insurance: 20.7%
  – Significant upward trends were seen in the proportion of adults up-to-date with colorectal cancer screening from 2000-2010 using any colorectal cancer screening regimen.

CDC. MMWR. January 27, 2012;61(3).
Treatment of Cancer of the Large Intestine

- Surgical excision with 5 cm margin
- Clearing colonoscopy at time of diagnosis; thereafter, q 3-5 years
- 40%-50% of patients have long-term survival after resection.
- Chemotherapy with 5-FU produces partial tumor remission in 15%-20%
- New agents: Irinotecan and oxaliplatin
- Radiation therapy useful for symptomatic metastases
Answers

1. B
2. C
3. D
4. B
5. B
6. D
7. C
8. A
9. C
10. D
Supplementary Slides
Cancer Screening Summary

Recommendations in National CRC Screening Guidelines

- Screening should begin at age 50.
- Recommended methods
  - Colonoscopy q 10 years (preferred)
  - Double-contrast BE q 5 years
  - FOBT and flex sig combined, annually and q 5 years, respectively
  - Flex sig every 5 years
  - gFOBT or FIT (fecal immunochemical test for blood) annually
  - CT colonography q 5 years
  - sDNA: Interval uncertain, manufacturer rec q 5 years

2008 ACS, ACR, US Joint Colorectal Cancer Screening Guidelines

CRC Screening Guidelines
American College of Physicians, 2012

- Individualized CRC risk evaluation: Older age, black race, personal history of polyps, inflammatory bowel disease, CRC, family history of CRC
- Begin at age 50; adults at high risk – age 40 or at 10 years before sentinel family case diagnosed
- Screening test based on risk stratification
  - Average: Stool-based test (annually), flexible sigmoidoscopy (5 years), or optical colonoscopy (10 years)
  - High: Optical colonoscopy
- Stop screening > 75 years or life expectancy of less than 10 years (potential harms of screening outweigh the potential benefits).

Diagnosis of Cancer of the Large Intestine

• Symptoms: Variable and nonspecific
  – Rectal bleeding
  – Lower abdominal pain
  – Change in bowel habits
• Physical findings
  – Abdominal mass
  – Enlarged liver
• Lab
  – Stool for occult blood

• Endoscopy
  – Flexible sigmoidoscopy
  – Colonoscopy
• Imaging
  – Barium enema
  – CT
  – Rectal ultrasound
11. Which of the following statements regarding constipation is true?

A. It is the most common digestive complaint in the general population.
B. Hyperthyroidism is a common etiology.
C. Acute treatment consists of bowel training.
D. Empiric treatment without diagnostic testing should uncommonly be used.
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A. It is the most common digestive complaint in the general population.
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✓ A. It is the most common digestive complaint in the general population.
Constipation

- A symptom, not a disease
  - Unsatisfactory defecation: Difficult, infrequent, incomplete
  - 95% of people have at least three BMs per week.
    - 2% of people report chronic constipation (M:F 1:3).
    - Most common digestive complaint in general population

- Etiologies
Constipation

• **Etiologies***
  - Diet
  - Drugs
  - Lack of adequate fluid intake
  - Lack of exercise
  - Irritable bowel syndrome
  - Depression
  - Hypothyroidism
  - Pelvic floor dysfunction
  - Spinal cord injury

• **History**
  - Beware of constipation of recent origin.
  - Stool pattern changes or alarm signs/symptoms: Rule out CANCER.

* Best Practice 1993;3(1)
Constipation

- **Physical findings**
  - Rectal exam: Fissures, hemorrhoids, sphincter abnormalities, anal/rectal prolapse, impaction
  - Abdominal exam: Check for abdominal mass.
  - Check for signs of hypothyroidism.

- **Diagnostic studies**
  - Insufficient evidence to support routine use of blood tests, radiography, or endoscopy in workup without alarm signs/symptoms (CBC, FOBT, TSH)
  - Endoscopy: Flexible sigmoidoscopy or colonoscopy
  - Imaging: Barium enema, ultrasound, CT, colonic transit studies, rectal manometry
Constipation

Treatment

• Depends on etiology
  – Empiric treatment without diagnostic testing can be considered when alarm features are absent.
  – Acute
    • Enemas, suppositories, osmotic laxatives
  – Patient education: Lifestyle, exercise, hydration, bowel training
  – Diet: High fiber (psyllium, methylcellulose, bran, polycarbophil)
  – Laxatives: Mineral oil, lactulose, polyethylene glycol
  – Rule out fecal impaction.
  – Treat depression, if present.
Cancer of the Anus

• Uncommon
  – Only 2%-3% as frequent as colon CA
  – 50%-60% squamous cell CA
  • Associated with chronic inflammation of anus, especially inflammatory bowel disease
  
  – Diagnosis: Biopsy
  – Treatment: Excision and radiation
Hemorrhoids

- **Pathogenesis**
  - Dilated sinusoids within anal canal and distal rectum
  - External vs internal
    - Determined by origin: Above/below the dentate line
- **History**
  - Usually bleeding is the symptom; can experience anal itching (external) or mild pain (internal); severe pain only with thrombosed hemorrhoids.
- **Physical exam**
  - Visual exam and digital exam
  - Anoscopy and sigmoidoscopy

Source: Mikael Häggström/Wikipedia
Hemorrhoids

• Treatment
  – High-fiber diet
  – Stool softeners
  – Hot sitz baths
  – Topical agents
  – Ligation
  – Infrared ablation
  – Surgery
Other Common Anal Problems

- Pruritus ani
- Anal fissure
Other Common Anal Problems

• Pruritus ani
  – Severe itching around anus
    • Worse with anxiety
  – Many causes
    • Fissure, fistula, hemorrhoid, dermatitis
    • Diabetes, STDs, premalignant lesions
    • Parasites, functional
  – Diagnosis: Rule out causes above.
  – Treatment
    • Improve anal hygiene.
    • Treat constipation and diarrhea.
    • 0.25% hydrocortisone cream
Anal Fissure

- Tear in anal mucosa
- Severe pain with defecation
- Diagnosis
  - Anoscopy
- Treatment
Treatment

- Warm sitz baths
- Anesthetic ointments
- Soften stool.
- Sclerotherapy
- Topical nitrates or CCBs
- Botulinum toxin injection
- Surgery
  - Disrupting to internal sphincter
    - 30% have problem controlling flatus.
    - 20% with minor fecal incontinence
References

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References


