COMMON GASTROINTESTINAL DISORDERS IN THE ELDERLY

Course Outline

- Review the anatomy and physiology of the aging gastrointestinal tract.
- Outline concepts of nutritional support of the aging body.
- Discuss key aspects of the physical examination and laboratory assessment as related to GI related disorders.
- Present information related to specific gastrointestinal symptoms and disorders.
A 73-year-old resident with history of arthritis and worsening pain in his left knee. Maximum doses of Acetaminophen have only provided minimal relief. After careful consideration you decide to start a Non-Steroidal Anti-inflammatory medication but you are concerned that this patient, who has a history of peptic ulcer disease, may be at risk for stomach upset or worse while taking the NSAID.
Poll Question

Which of the following would increase the risk for gastric bleeding and warrant use of a gastro-protective agent with the NSAID?

1. Systemic corticosteroid use
2. History of hypertension
3. History of chronic kidney disease
4. Anticoagulation therapy
5. Age over 60

Epidemiology

- 35% to 40% of geriatric patients will have at least 1 GI symptom in any year
- Common problems in this age group include constipation, fecal incontinence, diarrhea, irritable bowel syndrome (IBS), reflux disease, and swallowing disorders
- $300 million to treat GI disease in older patients in 2005
Overview of the GI System

- A long tube that runs through the body that has specialized sections that are capable to digesting materials that are ingested.
- The entire system is under hormonal control.
- The presence of food in the mouth triggers several hormonal actions.
- Food in the stomach activates a second set of hormones that activate acid secretion and increase gut motility.
- Nutrients are initially processed in the gut before additional processing takes place in the liver for storage and distribution.
The Oral Cavity

- The first portion of the alimentary canal that receives food and saliva.
- Produces voice using the tongue, throat, lips, and jaw.
- Provides a habitat for a variety of bacterial species.

Salivary Glands

- Parotid Gland
  - The largest salivary gland
  - Produces 25% of total saliva volume.
- Sublingual Gland
  - Salivary gland under the tongue.
- Submandibular Gland
  - The combination of the submandibular and sublingual glands account for 70% of total saliva volume.

Saliva facilitates mastication and swallowing and aids in the digestion of starches.
The Esophagus

- Food is chewed and passed to the esophagus.
- The esophagus secretes mucous from mucous glands that help food pass to the stomach with contraction of surrounding muscles.
- The muscles in the top 3rd are voluntary while the remainder is involuntary muscle.

The Stomach

- The stomach is a J-shaped organ with 4 regions. Each region performs a separate function.
- The fundus collects digestive gases.
- The body secretes pepsinogen and hydrochloric acid.
- The pylorus secretes mucus, gastrin, and pepsinogen.
- The throughout there are three layers of involuntary smooth muscle that aid digestion by physically breaking up food particles.

5 Major Functions of the Stomach
1. Temporary food storage
2. Control the rate at which food enters the duodenum
3. Acid secretion and antibacterial action
4. Fluidisation of stomach contents
5. Preliminary digestion with pepsin & lipases
The Small Intestine

- Most of the chemical and mechanical digestion occurs here.
- Virtually all available nutrients are absorbed here.
- Food moves forward through rhythmic contractions called peristalsis.

The Small Intestine by Section

- **The Duodenum**
  - Forms a c-shape around the head of the pancreas
  - Its main function is to neutralize the acidic gastric contents and initiate further digestion.

- **The Jejunum**
  - Absorbs nutrients

- **The Ileum**
  - Absorbs nutrients

Once nutrients and other digestive products are absorbed from the small intestine, they are passed to the hepatic portal system and taken to the liver for further processing.
The Pancreas

- Excretes enzymes into the duodenum that aid in digestion of fat, protein, and carbohydrates.
- These enzymes mix with bile from the liver that has been stored in the gall bladder.
- Bile emulsifies the food and makes fats water soluble. Once bile acts on the food, the pancreatic enzymes have more surface area to work on to continue digestion.

The Liver

- Largest organ of the body.
- Main organ of metabolism and energy production.
- Main Functions
  - Produce bile
  - Store vitamins, iron, and trace elements
  - Detoxification
  - Convert waste products so that they can be removed by the kidneys

Divided into a right and left lobe that are divided externally by the falciform ligament. The gallbladder sits at the bottom of the right lobe.

Each lobe has its own arterial supply, venous supply, and biliary drainage but both lobes have identical function.
The Portal Circulation

- The portal venous blood contains all the products absorbed from the GI tract.
- Blood arriving at the liver is filtered by macrophages to remove any bacteria or other pathogens that escaped the defenses of the GI tract.
- The remaining useful products in the blood are processed in the liver and stored for later use.

The Large Intestine (Colon)

- The time processed material reaches the large intestinal virtually of the nutrients have been removed.
- The large intestine now removes water from what is left and passes the remaining solids to be excreted as fecal matter.
Bacterial Defense System

- The gut normally carries a high population of bacteria.
- The large intestine and the ileum contain islands of lymphoid tissue that provide protection from pathologic infectious invasion.

Age Related GI Tract Changes

Gastrointestinal System
Age Related Changes in the GI Tract

- Swallowing disorders
- Gastroesophageal Reflux
- Dysmotility Symptoms
- Depressed Immune Function
- GI Tract Neoplasms
- Decreased Visceral Sensitivity

Esophageal Aging

- Dysphagia, regurgitation, chest pain, and heartburn are common problems.
- Underlying Changes in the esophagus
  - Decreased force of contraction
  - Incomplete relaxation of the lower esophageal sphincter
  - Esophageal dilatation
- GERD
  - Common in the elderly
  - Impaired clearance of acid
  - Longer duration of reflux episodes
  - Atypical presentation of symptoms
Aging and the Stomach

<table>
<thead>
<tr>
<th>DECREASED</th>
<th>INCREASED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearance of liquid from the stomach</td>
<td>Contact time with NSAIDs due to delayed gastric emptying</td>
</tr>
<tr>
<td>Perception of gastric distention</td>
<td>Contact time with other noxious medications due to delayed emptying</td>
</tr>
<tr>
<td>Cytoprotective factors</td>
<td>Damage to gastric lining due to delayed emptying</td>
</tr>
<tr>
<td>Mucosal blood flow</td>
<td>Prevalence of H. Pylori leading to and increased risk for gastric bleeding, Pernicious anemia, and Lymphoma</td>
</tr>
<tr>
<td>Impaired sensory neuron function</td>
<td></td>
</tr>
</tbody>
</table>

The Aging Gallbladder

- Bile becomes increasingly lithogenic with aging
  - Precipitation of supersaturated bile and concomitant crystallization of cholesterol or calcium bilirubinate
- In subjects aged > 35 years, fasting and postprandial gallbladder volumes increase
  - In older individuals, there was less complete gallbladder emptying following a meal
- Aging women may be more susceptible to impaired gallbladder contractility
- Compared to young patients, cholecystitis and cholangitis in older patients have increased morbidity and mortality
The Aging Pancreas

- Exocrine and endocrine pancreatic function in non-diabetic patients is preserved with aging
- Incidence of pancreatic cancer is increasing in patients aged > 65 years
  - Significantly worse surgical outcomes in patients > 74 years
  - Median survival is 11 months vs. 25 months in patients aged 64 to 74 years
- Approximately half of acute pancreatitis cases are patients aged > 60 years
  - Gallstones are most common etiology (60%)
  - 40%: surgery, drugs, trauma, infection, alcohol
  - Mortality in elderly is 20%; twice that of general population

Age Associated Changes in Colonic Motility

- Common disorders observed in the elderly that are correlated with colonic motility are:
  - Constipation
  - Diverticular disease
  - Diarrhea
  - Fecal incontinence
- There are age-associated reductions in myenteric neurons, calcium influx, and tensile strength of the collagen and muscle fibers
- No clear effect of age on colonic transit, as many constipated older patients appear to have normal transit times
Nutritional Risk & Requirements

Low Risk: BMI > 18.5 and 0% – 5% unintentional weight loss over 3 – 6 months

Moderate: BMI > 18.5 and 5% - 10% unintentional weight loss over 3 - 6 months

High Risk: BMI < 18.5 and > 10% unintentional wt. loss over 3 – 6 months

<table>
<thead>
<tr>
<th>Energy Requirement</th>
<th>Fluid Requirement</th>
<th>Protein Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 30 kcal per day</td>
<td>30 – 40 ml per kg per day</td>
<td>Men: 0.84 g – 1.07 g per kg per day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female: 0.75 g – 0.94 g per kg per day</td>
</tr>
</tbody>
</table>

Adjustments must be made for residents with specific conditions such as renal disease, liver disease, and wounds. Only 47% of daily water intake comes from drinking. 39% comes from solid food and the remainder from metabolism.

Age-Related Nutritional Changes

- Age-related changes that affect nutritional status
  - Loss of lean muscle mass that leads to gain in body fat
    - This change usually occurs with no change in weight, but the individual will show a loss of strength, functional decline, and poor endurance.
    - This loss also leads to reduced total body water content.
  - Loss of bone mineral density
    - Increased risk for osteoporosis
Age-Related Nutritional Changes

Many changes occur throughout the digestive system

- Decreased saliva production (xerostomia).
- Changes in dentition alter ability to chew leading to changes in food choices.

- Decreased gastric acid secretion can limit the absorption of vitamin B12 and iron.
- Decreased fluid intake increases risk for constipation.
- Sensory input changes alter appetite
  - Vision loss, diminished taste and impaired smell make food less appealing
Age-Related Nutritional Changes

- Other changes related to aging that alter appetite
  - Having foods chosen for you
  - Having meal time scheduled for you
  - Sedentary lifestyle
  - Social isolation
  - Loneliness
  - Depression

- Many medications can change how nutrients are absorbed and how food tastes.

The Following is a partial list of foods that can alter taste:

- Advair diskus
- Ambien
- Ace-inhibitors
- Atenolol
- Celebrex
- Combivent
- Coumadin
- Cubicin
- Depakote
- Duoneb
- Oral Exelon
- Flonase
- Fosamax
- Lexapro
- Lipitor
- Lupron
- Metformin
- Miacalcin
- Mobic
- Morphine Sulfate
- Nasonex
- Neurontin
- Nexium
- Norvasc
- Oxycontin
- Paxil

- Proton Pump Inhibitors
- Plavix
- Pravachol
- Prevacid
- Prozac
- Seroquel
- Sonata
- Wellbutrin
- Xanax
- Zyhtromax
- Zyprexa
- Zyvox
Nutrition

With aging, especially in those 85 years or older, there is increased risk for decreased food intake due to several factors:

1. Mobility impairment
2. Ability to obtain food
3. Loss of taste (due to decrease in olfaction)
4. Poor dentition
5. Decreased appetite
6. Anorexia of Aging (related to neuroendocrine changes)
7. Depression

Physical Examination

Gastrointestinal System
Examination of the Oral Cavity

- **Breath**
  - **Halitosis**
    - Caused by the release of volatile sulfur compounds from bacteria that colonize the surface of the tongue.

- **Gingivitis**
  - Reversible inflammation along the gingival line.
  - Results from poor control of plaque.
  - Diabetics are at increased risk.
  - Bacterial invasion of gram positive cocci & rods in the early stages.
  - Damage to the gingiva is caused by release of collagenase, hyaluronidase, protease, and endotoxin by invading bacteria.
  - Invading bacteria responsible for halitosis.

Periodontitis has been linked to infective endocarditis, cardiovascular disease, and pulmonary disease. In addition, it has been found that diabetes is more difficult to keep under control in individuals with significant periodontal disease.
GI Examination - Inspection

- Muscle tone appropriate for age
- Warm and dry skin
- Symmetric
- Flat
- Smooth
- No bulges
- Midline umbilicus
- May see pulsations in the epigastric area (Aorta)

GI Examination - Auscultation

- Bruits may indicate vascular underlying vascular issues.
- Bowel sounds
  - Report findings by quadrant (start in the RLQ and proceed counter clockwise).
  - Do not document absence of bowel sound in a quadrant unless you have listened for at least 3 minutes.
  - Normal sounds are high pitched gurgling noises that occur every 5 to 15 seconds (the frequency will change depending on presence of food in the GI tract or state of digestion).
## GI Examination - Percussion

<table>
<thead>
<tr>
<th>Finding</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tympany</td>
<td>High-pitched, drum-like sound that is usually heard over air filled areas.</td>
</tr>
<tr>
<td>Hyperresonance</td>
<td>A loud booming sound that is usually heard over hyperinflated areas.</td>
</tr>
<tr>
<td>Dullness</td>
<td>A soft, high-pitched, thud like sound that is heard over dense organs such as the liver.</td>
</tr>
<tr>
<td>Flatness</td>
<td>A soft, high-pitched, sound that is generally heard over muscle, bone, and tumors.</td>
</tr>
</tbody>
</table>

## GI Examination - Palpation

- **General Palpation**
  - Palpate with fingers with pressure applied by the opposite hand.
  - Should be soft and non-tender with no masses.

- **Rebound Tenderness**
  - Test of peritoneal inflammation.
Laboratory Assessment

Gastrointestinal Function

Complete Blood Count (CBC)

<table>
<thead>
<tr>
<th>Test</th>
<th>Level</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>Normal or Low</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>Normal or Low</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Mean Corpuscular Volume (MCV)</td>
<td>Normal or Low</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Mean Corpuscular Hemoglobin</td>
<td>Normal or Low</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Red Blood Cell Distribution Width (RDW)</td>
<td>Low, Normal, or High</td>
<td>Any pattern</td>
</tr>
<tr>
<td>Platelet Count</td>
<td>Low, Normal, or High</td>
<td>Any pattern</td>
</tr>
</tbody>
</table>

CBC may give clues to the presence of a variety of GI-related conditions such as malabsorption, iron deficiency, B-12 deficiency, chronic gastrointestinal blood loss, celiac disease.

If resident has unexplained anemia obtain stool for occult blood. 3 samples should be obtained. All samples can be obtained from a single stool.
Liver (Hepatic) Profile

- Alanine aminotransferase (ALT) – an enzyme mainly found in the liver; the best test for detecting hepatitis
- Alkaline phosphatase (ALP) – an enzyme related to the bile ducts but also produced by the bones, intestines, and during pregnancy by the placenta (afterbirth); often increased when bile ducts are blocked
- Aspartate aminotransferase (AST) – an enzyme found in the liver and a few other organs, particularly the heart and other muscles in the body
- Bilirubin – two different tests of bilirubin often used together (especially if a person has jaundice): total bilirubin measures all the bilirubin in the blood; direct bilirubin measures a form that is conjugated (combined with another compound) in the liver
- Albumin – measures the main protein made by the liver; the level can be affected by liver and kidney function and by decreased production or increased loss
- Total protein (TP) – measures albumin and all other proteins in blood, including antibodies made to help fight off infections

Liver (Hepatic) Profile

- Gamma-glutamyl transferase (GGT) – another enzyme found mainly in liver cells
- Lactate dehydrogenase (LDH) – an enzyme released with cell damage; found in cells throughout the body
- Prothrombin time (PT) – the liver produces proteins involved in the clotting (coagulation) of blood; the PT measures clotting function and, if abnormal, may indicate liver damage.
### Laboratory Testing of GI Function

<table>
<thead>
<tr>
<th>Malabsorption</th>
<th>Serum Calcium</th>
<th>Usually low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alkaline Phosphatase</td>
<td>Elevated</td>
</tr>
<tr>
<td></td>
<td>Serum Proteins</td>
<td>Decreased</td>
</tr>
<tr>
<td></td>
<td>Total Cholesterol</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Prothrombin Time</td>
<td>May be markedly prolonged due to reduced vitamin K absorption</td>
</tr>
<tr>
<td></td>
<td>BUN</td>
<td>Low due to decreased protein absorption</td>
</tr>
</tbody>
</table>

Additional test that are easily obtained in the LTC facility
- Fecal fat (expected to be elevated)

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### Break #1

**Question and Answer Session**
Abnormal Bowel Function

Gastrointestinal Symptoms

- Constipation
- Fecal Impaction
- Dysphagia
- Unplanned Weight Loss

Bristol Stool Chart

Type 1: Separate hard lumps, like nuts
Type 2: Sausage-like but lumpy
Type 3: Like a sausage but with cracks in the surface
Type 4: Like a sausage or snake, smooth and soft
Type 5: Soft blobs with clear-cut edges
Type 6: Fluffy pieces with ragged edges, a mushy stool
Type 7: Watery, no solid pieces
Prevalence of Constipation

![Prevalence of Selected Diseases in US Adults](image)

- Constipation
- Hypertension
- Migraine
- Diabetes
- Asthma
- Coronary Heart Disease

Prevalence in Millions
Criteria for Functional Constipation

- Presence for at least 3 of the last 6 months
- Insufficient criteria for IBS with constipation
- No stools or rarely loose stools
- Two or more of the following
  - Straining
  - Lumpy hard stools
  - Feeling of incomplete evacuation
  - Sensation of ano-rectal blockade or obstruction
  - Manual or digital maneuvers required
  - Fewer than 3 defecations per week

Criteria for IBS with Constipation

<table>
<thead>
<tr>
<th>Functional Constipation</th>
<th>IBS-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more of the following</td>
<td>• Improvement with defecation</td>
</tr>
<tr>
<td>• Straining</td>
<td>• Onset associated with change in stool frequency</td>
</tr>
<tr>
<td>• Lumpy hard stools</td>
<td>• Onset associated with change in stool form</td>
</tr>
<tr>
<td>• Sensation of incomplete evacuation</td>
<td>• Stools may be hard, lumpy, loose, or watery.</td>
</tr>
<tr>
<td>• Sensation of blockage</td>
<td>• Recurrent abdominal pain or discomfort</td>
</tr>
<tr>
<td>• Use of manual maneuvers</td>
<td></td>
</tr>
<tr>
<td>Loose stools rarely present</td>
<td></td>
</tr>
</tbody>
</table>
### Alarm Symptoms

- Change in stool caliber
- Heme-positive stool
- Iron deficiency anemia
- Obstructive symptoms
- Recent onset of constipation
- Rectal bleeding or rectal prolapse
- Weight loss
- Age > 50 with no prior colon cancer screening

### Risk Factors for Constipation

- Depression
- Degenerative Joint Disease
- Inactivity/ Immobility
- Low caloric intake/ Anorexia
- Number of medications being taken
- Cognitive impairment
- Female sex – higher incidence of self-reported constipation is seen in females
- Medical conditions: Autonomic Neuropathy, Cerebrovascular Disease, Depression, Multiple Sclerosis, Parkinson’s Disease, Renal Disease, Dehydration, Diabetes Mellitus, Hypercalcemia, Hypokalemia, Hemorrhoids, Cardiac Disease
### Medications that Increase Risk

- Antidepressants
- Antiepileptics
- Antihistamines
- Antispasmodics
- Calcium-channel blockers
- Diuretics
- Opiates
- Antipsychotics
- Antiparkinson drugs

### Approach to Constipation

- Don’t allow complacency because a bowel regimen is in place
- History and physical examination
- Medical approach (in absence of “alarm symptoms”
  - Fiber and MOM
  - Add Lactulose/ Polyethylene glycol
  - Add bisacodyl
- Treatment resistant
  - Standard blood testing to rule out organic causes
  - Consider constipation pre-dominant IBS
    - Treat with combination of fiber and an osmotic laxative
Approach to Constipation

- Advanced Therapy
  - Consider that resident may have “slow transit constipation” (STC)
  - Fiber, MOM, Bisacodyl
  - Prucalopride, Lubiprostone
  - Add Lactulose/ Polyethylene glycol

In refractory cases, GI consultation may be required.

Fecal Impaction

- Solid immobile bulk of feces that sits in the rectum.
- Most prominent symptom is constipation.
- Causes include inactivity, low fiber intake, Medications (especially narcotics), Thyroid dysfunction, and hypocalcemia.
- Prevention measures include intake of fiber and water in combination with exercise.
- Primary Treatment: enemas, osmotic laxatives (mag citrate), digital breakage and removal.
Dysphagia

Gastrointestinal Disorders

- Difficulty that may be had with initiating a swallow (oropharyngeal dysphagia); or
- The sensation that foods and or liquids are not easily able to pass from the mouth to the stomach (esophageal dysphagia).
Dysphagia

- The act of swallowing
  - Controlled by the swallow center in the medulla oblongata (brainstem).
  - Autonomic reflexes in the mid and distal esophagus play a key role in peristalsis once swallowing has been initiated.

Stages of Swallowing

<table>
<thead>
<tr>
<th>Oral Phase</th>
<th>Oro-pharyngeal Phase</th>
<th>Esophageal Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food enters the mouth</td>
<td>Tongue pushes the bolus to the pharynx</td>
<td>Upper esophageal sphincter relaxes</td>
</tr>
<tr>
<td>Food is chewed</td>
<td>Soft palate rises to seal the nasopharynx</td>
<td>Bolus passes to the esophagus</td>
</tr>
<tr>
<td>Food formed into a bolus</td>
<td>Epiglottis moves posterior and downward to close</td>
<td>Esophagus contracts sequentially</td>
</tr>
<tr>
<td></td>
<td>Respirations stop</td>
<td>Lower esophageal sphincter relaxes</td>
</tr>
<tr>
<td></td>
<td>Pharynx shortens</td>
<td>Bolus reaches the stomach</td>
</tr>
</tbody>
</table>
**Type of Dysphagia**

<table>
<thead>
<tr>
<th>oropharyngeal dysphagia</th>
<th>esophageal dysphagia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty initiating swallow</td>
<td>Intermittent dysphagia associated with chest pain</td>
</tr>
<tr>
<td>Nasal regurgitation</td>
<td>Symptoms of obstruction as seen with esophageal strictures</td>
</tr>
<tr>
<td>Coughing</td>
<td></td>
</tr>
<tr>
<td>Nasal speech</td>
<td></td>
</tr>
<tr>
<td>Diminished cough reflex</td>
<td></td>
</tr>
<tr>
<td>Choking</td>
<td></td>
</tr>
<tr>
<td>Dysarthria (#1)</td>
<td></td>
</tr>
<tr>
<td>Halitosis (#2)</td>
<td></td>
</tr>
</tbody>
</table>

1. Possibly due to associated neurologic conditions
2. Possibly due to residue-containing Zenker's diverticulum

**Bedside Screening**

- **Timed water-swallow test**
  - Have resident drink 150 ml of water from a glass as quickly as possible.
  - Record the time it takes and the number of swallows.
  - Calculate the speed of swallowing and the average volume per swallow.
- The test is 95% specific for identifying the presence of dysphagia but does not identify aspiration.
- Aspiration should be established via a Modified Barium Swallow.

*Approximately 1.2 swallows per second with about 25 cc per swallow*
## Dysphagia Treatment Options

### Oro-pharyngeal Dysphagia
- Options limited by inability to correct the underlying neurological problem with exception of Parkinson's Disease and Myasthenia Gravis
- Appropriate dietary changes
- Monitor for dehydration
- Addition of citric acid to feedings may improve swallow reflex (increased trigeminal stimulation)
- PEG (not likely to be subsequently removed if elderly or if s/p bilateral stroke)

### Pharyngeal Dysphagia
- Diffuse esophageal spasm
  - Nitrates or calcium channel blockers
  - Esophageal dilation for Dilation
- Achalasia (esophageal motility disorder)
  - Soft diet
  - Anticholinergic medication
  - Calcium channel blockers
  - Dilation
- Peptic stricture
  - H2 blockers or PPI's
  - Dilation
### Unplanned Weight Loss

**Gastrointestinal Symptoms**

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#### What Determines Body Weight

<table>
<thead>
<tr>
<th>Expected Response to Aging</th>
<th>Interactions &amp; Influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Total body weight peaks in the fifth to sixth decade of life.</td>
<td>□ Caloric Intake</td>
</tr>
<tr>
<td>□ In later life there is an expected decreased in weight of 1 – 2 kg per decade.</td>
<td>□ Absorption</td>
</tr>
<tr>
<td></td>
<td>□ Utilization</td>
</tr>
<tr>
<td></td>
<td>□ Influences</td>
</tr>
<tr>
<td></td>
<td>□ Age</td>
</tr>
<tr>
<td></td>
<td>□ Health Status</td>
</tr>
<tr>
<td></td>
<td>□ Medications</td>
</tr>
</tbody>
</table>
Clinically Important Weight Loss

- 10 pound weight loss or more than 5% loss of usual body weight over a period of 6 – 12 months, especially if the loss is progressive.
- Weight loss greater than 10% over 12 months is considered to represent protein-energy malnutrition.
  - At this level there is impaired physiologic function such as cell-mediated immunity.
- Weight loss greater than 20% over 12 months implies severe protein-energy malnutrition and is associated with severe organ dysfunction.

Etiologies of Unintended Weight Loss

- **Organic Etiologies**
  - Malignancy (33% of all cases)
    - Signs and symptoms may be subtle or non-specific
    - Most prominent sites are gastrointestinal, hepatobiliary, hematologic, lung, breast, genitourinary, ovarian, and prostate
  - Gastrointestinal Disorders (15% of all cases)
    - Peptic ulcer disease, Inflammatory bowel disease, Gastroparesis, chronic pancreatitis, celiac disease, constipation, periodontal disease, xerostomia
Etiologies of Unintended Weight Loss

- **Organic Etiologies - Continued**
  - **Endocrine disease**
    - Diabetes Mellitus, hyperthyroidism, hypothyroidism.
  - **Infection**
    - Tuberculosis, fungal disease, viral, and bacterial
  - **Medications**
    - Adverse events of taking medications that can cause weight loss include anorexia, nausea, diarrhea, altered absorption and utilization of nutrients

92 year old female with mild dementia who is being assessed for weight loss. She has been at the facility for 6 months and had no problems with weight during the first 4 months of her stay and requires assistance with meals. She states that she has no appetite and review of her intake shows that she routinely leaves more than 25% of her tray. She has not had any pain and there is no history of food allergies. Three months ago she was started on an antidepressant for symptoms of depression and anxiety and she says she feels better since treatment was started. Her last PHQ-9 score, 3 weeks ago, was 5. She was recently seen pouring her cereal out of a bowl and looking at it before putting it back in the bowl and adding milk.

She is 5’4” and her weight has dropped from baseline 114 pounds (BMI 19.57) to 107 pounds (BMI 18.37). Her midarm circumference is 18 cm, her calf circumference is 29 cm.
Poll Question

Do you think that this resident is malnourished?

1. Yes
2. No

Significant Unplanned Weight Loss Screen

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight validated (same scale that has been calibrated)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is resident complaining of feeling hungry?</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Leaves more than 25% of meals</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complaints regarding type, quality or enjoyment of food</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cultural food preferences discussed and needs met?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the resident have food allergies (If so, comment on needs being met to date)?</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Recent medication changes</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistance required with feeding (If so, comment on type of assistance and reason for it)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>S/S of depression (Withdrawal, Crying, Refusing to eat)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has resident exhibited any fear of food being poisoned?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is it possible that pain is affecting intake?</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Significant Unplanned Weight Loss Screen

### YES NO COMMENT

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has there been a recent hospitalization?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Has there been a recent infection?</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Environmental issues (example - room temperature)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Does food intake meet estimated need?</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Comment on the potential impact of any of the following chronic conditions:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Mellitus</td>
<td></td>
</tr>
<tr>
<td>Parkinson's Disease</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
</tr>
<tr>
<td>Radiation Therapy</td>
<td></td>
</tr>
<tr>
<td>Pressure or other wounds</td>
<td></td>
</tr>
<tr>
<td>Ostomy</td>
<td></td>
</tr>
<tr>
<td>Dysphagia</td>
<td></td>
</tr>
<tr>
<td>GERD</td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td></td>
</tr>
</tbody>
</table>

**American Family Physician at aafp.org**

---

### Nutritional Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropometric assessment</td>
<td></td>
</tr>
<tr>
<td>1. Body mass index (weight in kg / height in m&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>1 point</td>
</tr>
<tr>
<td>2. Midarm circumference</td>
<td>0 point</td>
</tr>
<tr>
<td>3. Waist circumference</td>
<td>0 point</td>
</tr>
<tr>
<td>4. Weight loss during past 3 months</td>
<td>2 points</td>
</tr>
<tr>
<td>General assessment</td>
<td></td>
</tr>
<tr>
<td>5. Uses independently (out of a nursing home or hospital</td>
<td>0 point</td>
</tr>
<tr>
<td>6. More than three prescribed medications</td>
<td>0 point</td>
</tr>
<tr>
<td>7. Has suffered psychological stress or acute disease in the past 3 months</td>
<td>0 point</td>
</tr>
<tr>
<td>Dietary assessment</td>
<td></td>
</tr>
<tr>
<td>12. Selected consumption patterns for protein intake</td>
<td>1 point</td>
</tr>
<tr>
<td>13. Overall nutritional status compared with the health status of other people of the same age</td>
<td>0.5 point</td>
</tr>
<tr>
<td>14. Self-fed with no problems</td>
<td>2 points</td>
</tr>
</tbody>
</table>

**Assessment total minimum of 30 points**

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**8/14/2013**
Managing Unintended Weight Loss

- There are no FDA approved medications to stimulate appetite in the elderly.
- Most studies have failed to show that medications commonly used to stimulate appetite have had impact on morbidity, mortality, function, or quality of life.
- Most effective interventions have been nutritional intervention combined with treating underlying conditions (example: ill-fitting dentures, pain, and depression).

Medications To Stimulate Appetite

- **Megesterol Acetate (Megace)**
  - Only approved for HIV associated weight loss.
  - Associated with increased risk for DVT and toxic reactions in elderly patients with impaired renal function.
  - Par Pharmaceutical settled a multimillion dollar federal lawsuit for inappropriate marketing in LTC.

- **Mirtazapine (Remeron)**
  - Effective in improving appetite if the underlying cause of weight loss was depression
  - Those who responded had a tendency to respond early in the course of treatment.

- **Dronabinol**
  - Limited use in the elderly due to risk of seizures, confusion, and insomnia.
Break #2

Question and Answer Session

Abnormal GI Function

Gastrointestinal Disease

- Peptic Ulcer Disease
- PPI Syndrome
- Norwalk Virus
- Clostridum Difficile

Interact III – Avoiding Hospitalizations
Cyclospora
Nursing staff reports that resident has been waking up in the middle of the night during the last 2 weeks. There has also been a noticeable decrease in caloric intake during the time with refusal of meals on occasion. He has also shown periods of increased agitation during the afternoon. He has lost 2 pounds over the past month. His family has reported that they bring food from home that he typically enjoys but he has been turning it away recently.
Patient history

- The resident is cognitively impaired and unable to give a history or report symptoms. If able to he would report;
  - He is waking up in the middle of the night with abdominal pain.
  - This has been happening several nights per week.
  - His appetite has suffered due to the abdominal pain.
  - He has fear that what he has been eating is responsible for the pain, so he has been pushing food away.

Peptic Ulcer Disease

Gastrointestinal Disorders
Peptic Ulcer Disease

- A sore that occurs in the lining of a part of the GI tract that is exposed to pepsin and acid secretions.
- Most occur in the lining of the stomach or the duodenum.
- 90% of all gastric ulcers are caused by H. pylori infection.
- 80% of all duodenal ulcers are caused by H. pylori infection.
- Most remaining ulcers are caused by long term use of anti-inflammatory drugs like aspirin.

Helicobacter Pylori

- Not clear how the infection is spread.
- Has been identified in the saliva of infected individuals.
- The bacteria has the ability to survive in the GI tract because they produce enzymes that neutralize stomach acids.
- They can move through the mucous membrane lining of the stomach and live in the underlying connective tissue.
- The initial damaged to the mucous membrane allows pepsin and hydrochloric acid to enter and do additional damage, eventually allowing formation of an ulcer.
Helicobacter Pylori

- Drugs that increase risk for infection
  - Non-Steroidal anti-inflammatory agents
  - Steroids
  - Valproate
  - Iron
  - Calcium salts
  - Potassium chloride
  - Antibiotics

Helicobacter Pylori

- Symptoms
  - Epigastric pain
  - Indigestion
  - Nausea (possibly coffee grounds)
  - Post-prandial vomiting
  - Diarrhea
  - Dark or black stool
  - Irritability
  - Poor feeding and weight loss

- Physical exam will show epigastric tenderness and normal bowel sounds
Helicobacter Pylori

- Laboratory testing
  - Stool positive for occult blood
  - CBC
    - Anemia with clues of chronic blood loss that would include a low MCV (microcytosis) and a low reticulocyte count
  - ID of H. Pylori
    - Isolation of antibody from serum, saliva, or urine
    - Stool test for h. pylori antigen
    - Rapid urease test from gastric biopsy (invasive)
    - Stain of gastric biopsy for H. pylori (invasive)
    - Culture of gastric biopsy for H. pylori (invasive)

- UGI film when endoscopy not available
- CXR may detect free abdominal air if there is perforation

Potentially alarming symptoms include bleeding, anemia, early satiety, unexplained weight loss, progressive dysphagia, recurrent vomiting, family history of GI cancer, and previous esophagogastric malignancy.

H. Pylori testing is indicated for those gastric MALT lymphoma, active peptic ulcer disease, or past history of peptic ulcer.

Testing involves:

- Laboratory testing
- UGI film when endoscopy not available
- CXR may detect free abdominal air if there is perforation

An optimum treatment has not been identified.

Initial Therapy: triple therapy should be used when clarithromycin resistance is low. When clarithromycin resistance is high (> 15% of all cases) quadruple therapy should be used.

1. PPI such as Omeprazole 20 mg BID for 7 – 14 days.
2. Amoxicillin 1 g BID for 7 - 14 days.
3. Clarithromycin 500 mg BID for 7 – 14 days.
Quadruple Therapy

If eradication is unsuccessful using triple therapy, quadruple therapy is recommended for 7 – 14 days, including:
1. Bismuth
2. Metronidazole
3. A proton pump inhibitor
4. An antibiotic
   1. Amoxicillin
   2. Clarithromycin
   3. Tetracycline

Plan of care should also include supportive care with monitoring of hemodynamics, fluids, and electrolytes. Monitor for hemoccult positive stools, follow CBC’s.

Dyspepsia Treatment Pearls

Case Study:
Resident with vague signs and symptoms of abdominal pain who is taking medications for hypertension and a seizure disorder. There is no prior history of gastrointestinal disease and no reports of nausea, vomiting, constipation, or diarrhea.

- Treatment options for a patient with uninvestigated dyspepsia in the non-NSAID user include
  - Testing for H. pylori and treating if positive
  - A trial of H2-receptor blockers
  - A trial of PPI’s
Management of ASA-related Bleeding

- Teaching Point #1: in patients with a recent history of upper GI bleeding, the combination of low-dose aspirin and a PPI is superior to clopidogrel in preventing recurrent upper GI bleeding.

- Teaching Point #2: Following a GI bleed, co-prescription of a PPI is at least as good and possibly superior to one time H. pylori eradication in patients that need ongoing aspirin therapy following an upper GI bleeding event.

Use of PPI’s and H2 Blockers

Medications and the GI Tract
Proton Pump Inhibitors

- A class of medications that drastically reduce gastric acid production.

Indications
- Dyspepsia
- Peptic Ulcer Disease
- Gastroesophageal Reflux Disease (GERD)
- Hypersecretory Conditions
- Barrett’s Esophagus
- Gastric Ulcer Prophylaxis (NSAID Associated)
- H. Pylori Infections

Potential Consequences of Chronic Use
- Pneumonia
- Diarrhea
  - Significant increased risk for C. Difficile infection because decreased acid levels
- Cancer
- Osteoporosis
- B12 deficiency
Proton Pump Inhibitors

**PPI Mechanism of Action**

- Blocks hydrogen/potassium/adenosine triphosphatase enzyme system in parietal cells (the cells that secrete acid into the stomach).
- Blockage leads to decreased release of gastric acid.
- Gastric acid secretion is reduced by up to 99%.

**Histamine-2 Blockers**

- AKA H2-blockers.
- Block action of histamine on parietal cells.
- Much less potent than Proton Pump Inhibitors.

Gastrin, Histamine-2, and Acetylcholine all stimulate release of HCL from parietal cells of the stomach.

Case Study
An 82-year-old male complains of burning in his chest behind the sternum. It started about a month ago with symptoms 3 to 4 times per week, usually after having a meal. Now he is getting symptoms everyday and states that he occasionally gets a sour (acidic) taste in his mouth. He has been getting TUMS and Maalox since his PPI was discontinued about 5 weeks ago, but they only give temporary relief.

Poll Question
How should you respond to this problem?

A. Continue Maalox and TUMS, but give it more frequently.
B. Restart the PPI
C. After the PPI is restarted, Attempt a gradual dose reduction
D. Obtain a GI consult
E. Replace TUMS and Maalox with an H-2 blocker
PPI Pearls

- An 8-week course of PPI therapy is more effective in healing NSAID-induced peptic ulcers than are H2-blockers.
- There is no difference in healing rate of ulcer disease between the different PPI’s.
- Double dose PPI’s are no more effective than standard dose of PPI’s for healing peptic ulcers.
- There is some evidence that the combination of COX-2 inhibitors and PPI’s is superior to COX-2 therapy alone, but it is insufficient to make the recommendation routinely.

Interact III

Gastrointestinal Disorders and Hospitalizations
An 81-year-old female complains of abdominal pain. She is diaphoretic and guarding her abdomen. Her temperature is 100.0F orally, blood pressure 140/75, pulse 90, respirations 18 and unlabored, and her oxygen saturation is 98% on room air.

She has a past history of hypertension and coronary artery disease.

History of Present Illness

- Are you having pain now?
  - Yes.
  - A sharp stabbing pain in the stomach.
  - It began last night as a dull ache around the belly button.
  - The pain kept getting worse and turned into a sharp stabbing pain this morning.
  - She feel it all the way across my belly.
  - It doesn’t hurt anywhere else.
  - It hurts constantly.
  - Pain level is 8.
  - It hurts worse when I move, cough, or sneeze.

- Are you having nausea or vomiting?

- When was your last bowel movement?
History of Present Illness

- Are you having pain now?
- **Are you having nausea or vomiting?**
  - Yes, she threw up my dinner (tuna casserole) last night.
  - 2 cups of brown mush.
  - There wasn’t any blood.
  - She was so nauseous that I couldn’t eat breakfast today.
  - Was able to keep down a glass of ginger ale 3 hrs ago.
  - She is sweaty but feels cold.
  - No one else in the facility got sick.
- When was your last bowel movement?

---

History of Present Illness

- Are you having pain now?
- Are you having nausea or vomiting?
- **When was your last bowel movement?**
  - She had a large formed bowel movement yesterday.
  - She typically has a formed bowel movement everyday.
  - She passed urine about 4 hours ago.
### Physical Examination

#### Inspection
- **General**
  - Facial grimacing
  - Appears anxious

#### Contour and Skin
- Flat and smooth with age appropriate muscle tone
- No bulging or masses
- Skin is diaphoretic with no cyanosis or scars
- Mild pulsation noted in epigastric area

#### Umbilicus
- Midline with no discoloration, inflammation, or hernia

#### Auscultation
- High pitched bowel sounds audible in all quadrants
- No bruits heard

#### Percussion
- General tympany
- No costovertebral angle tenderness

#### Palpation
- Rigid abdominal wall with RLQ tenderness and positive iliopsoas muscle test

#### Rebound Tenderness
- Present
## CAREPATH for GI Symptoms

### Initial Assessment Observation

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea and/or vomiting</td>
<td>YES</td>
</tr>
<tr>
<td>Diarrhea (3 or more loose or liquid bowel movements per day)</td>
<td>NO</td>
</tr>
<tr>
<td>Constipation (no bowel movement in 3 days)</td>
<td>NO</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>YES</td>
</tr>
<tr>
<td>Distended abdomen</td>
<td>NO</td>
</tr>
</tbody>
</table>

### Vital Signs Observation

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature &gt; 100.5</td>
<td>NO</td>
</tr>
<tr>
<td>Apical heart rate &gt; 100 or &lt; 50</td>
<td>NO</td>
</tr>
<tr>
<td>Respiratory rate &gt; 28/min or &lt; 10/min</td>
<td>NO</td>
</tr>
<tr>
<td>BP &lt; 90 or &gt; 200 systolic</td>
<td>NO</td>
</tr>
<tr>
<td>Oxygen saturation &lt; 90%</td>
<td>NO</td>
</tr>
<tr>
<td>Finger stick glucose &lt; 70 or &gt; 300</td>
<td>NO</td>
</tr>
</tbody>
</table>
CAREPATH for GI Symptoms

<table>
<thead>
<tr>
<th>Evaluation of Signs and Symptoms</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal tenderness or distention</td>
<td>YES</td>
</tr>
<tr>
<td>Absent or hyperactive bowel sounds</td>
<td>NO</td>
</tr>
<tr>
<td>Jaundice</td>
<td>NO</td>
</tr>
<tr>
<td>Blood in stool or vomitus</td>
<td>NO</td>
</tr>
<tr>
<td>Recurrent diarrhea after treatment for c. difficile</td>
<td>NO</td>
</tr>
<tr>
<td>Other residents with similar symptoms suggesting outbreak of GI virus</td>
<td>NO</td>
</tr>
<tr>
<td>Recent initiation or adjustment of tube feeding (diarrhea)</td>
<td>NO</td>
</tr>
<tr>
<td>Recent initiation or adjustment of narcotic medication (constipation)</td>
<td>NO</td>
</tr>
</tbody>
</table>

Initiate Work-Up

- Abdominal x-ray or ultrasound
- Stool specimen for occult blood
- Stool specimen for culture and c. difficile assay

Lab testing

- CBC and CMP
- Amylase, Lipase, and thyroid profile
- Digoxin level if on digoxin
The abdominal x-ray showed evidence of an ileus (bowel obstruction).

Typical Symptoms: constipation, distention, nausea, vomiting, bile emesis, flatulence, and belching.

Treatment Considerations:
- IV line
- NG tube to suction out air and fluids

### Management of Ileus

- **With partial mechanical obstruction**
  - Low fiber diet (easier for the GI tract to process)
  - With time it usually resolves itself
  - If not surgery may be required
- **With complete mechanical obstruction**
  - Usually requires surgery to relieve the blockage
- **With paralytic ileus**
  - Monitor for a day or two (hospital may be required)
  - The condition is usually temporary and resolves on its own with supportive care
CAREPATH for GI Symptoms

- What to look for
  - Results of x-ray or ultrasound suggests ileus, obstruction, mass, or perforation.
  - Critical lab values.
  - Stool analysis suggests infection.

CAREPATH for GI Symptoms

- Plan of Care: Manage at Facility
  - Monitor vital signs and abdominal exam every 4 to 8 hours.
  - Monitor intake, urine output, and number of episodes of vomiting or diarrhea.
  - Initiate medications for nausea, vomiting, diarrhea, and constipation as needed.
  - Consider IV or subcutaneous fluids.
  - Update care plan.
CAREPATH for GI Symptoms

- Monitoring
  - Vital Signs
    - Keep temperature at 100.5 or less
    - Maintain apical heart rate between 50 - 99
    - Maintain respiration between 10 - 28
  - Worsening condition

Cyclosporiasis

Nationwide Outbreak
DOHMH Alert #27
July 31, 2013
Cyclosporiasis (Cyclospora)

- **Background Information**
  - CDC is investigating a nationwide outbreak of Cyclosporiasis infection.
  - Through July 30, 2013, 5 cases had been identified in New York City and 372 cases nationally.

- **Cyclospora**
  - A coccidian parasite.
  - Causes watery diarrhea, nausea, loss of appetite, abdominal cramping, and fatigue.

Cyclosporiasis (Cyclospora)

- **Infectivity**
  - People become infected by eating contaminated food.
  - Direct person-to-person contact is not likely.

- **Clinical Presentation**
  - Primary symptom: Diarrhea of at least 5 days that may persist for weeks if not treated.
  - Other symptoms are abdominal cramps, nausea, anorexia, and fatigue.
  - Diarrhea may become intermittent and other symptoms may predominate.
Cyclosporiasis (Cyclospora)

Medical Work-Up
- May not be detected by obtaining routine tests for ova and parasites.
- Laboratory diagnosis requires a modified acid fast stain that is only done if the prescriber specifically orders "TEST STOOL FOR CYCLOSPORA"

Treatment
- Trimethoprim 160 mg-sulfamethoxazole 800 mg (one double strength tablet) orally twice per day for 7 – 10 days.
  - HIV+ patients may need extended therapy

Report all cases to the Health Department 1-866-692-3641
Clostridium Difficile

Norwalk Virus
Questions?