

All about The GI System

A self paced learning program for
direct care staff

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Fall 2011

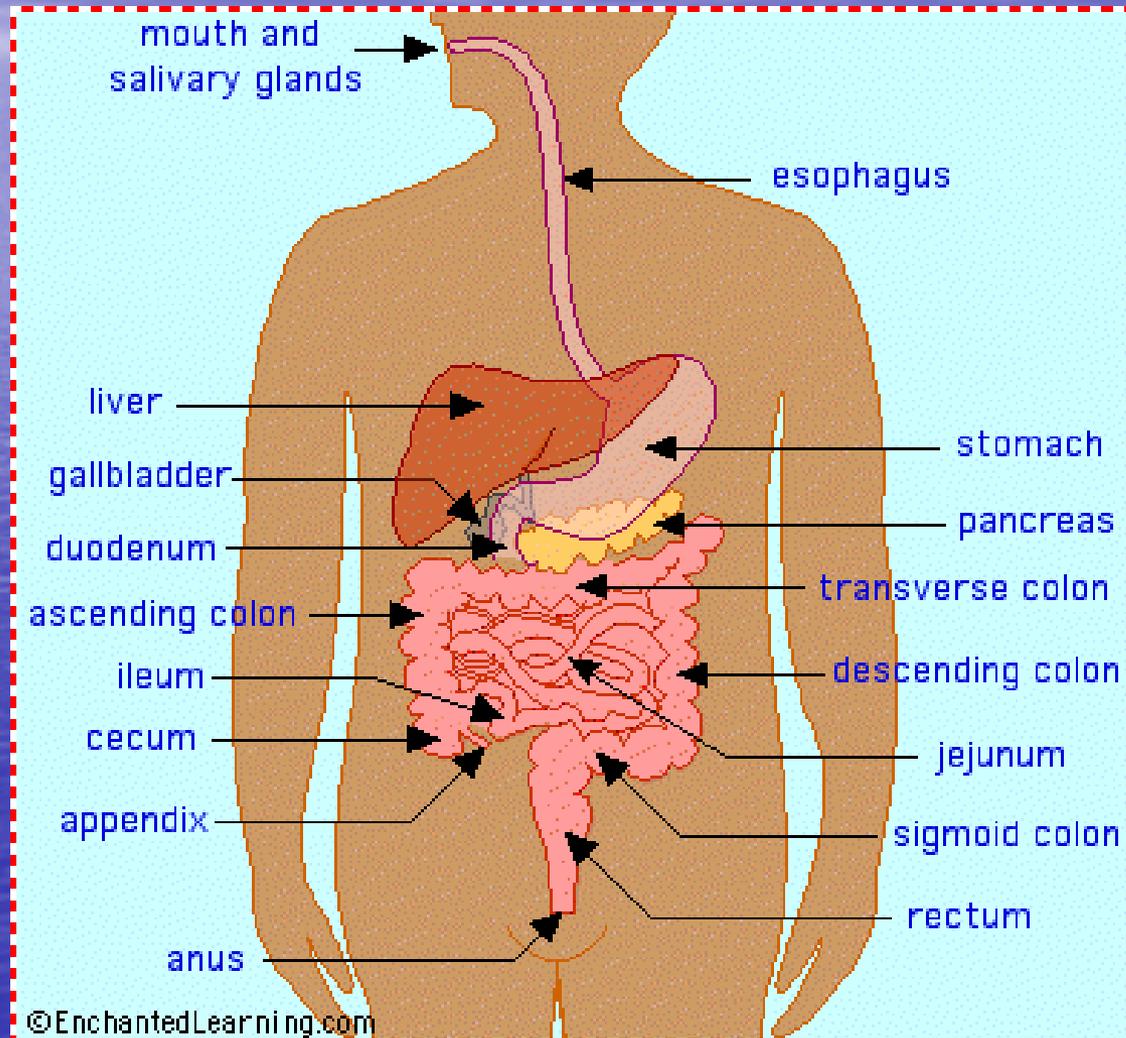
Introduction

- This is a self paced independent training program for direct care staff.
- The information taught will promote safe care of individuals served in the DD community setting.

Objectives: The Participant will be able to:

- Understand the basic anatomy and physiology of the gastrointestinal tract.
- Identify two types of constipation.
- State 4 causes of constipation.
- State 3 causes of diarrhea.
- Identify the reason why the Bristol Stool Scale is important.
- Identify 3 possible solutions to prevent constipation.

The GI System a Snapshot

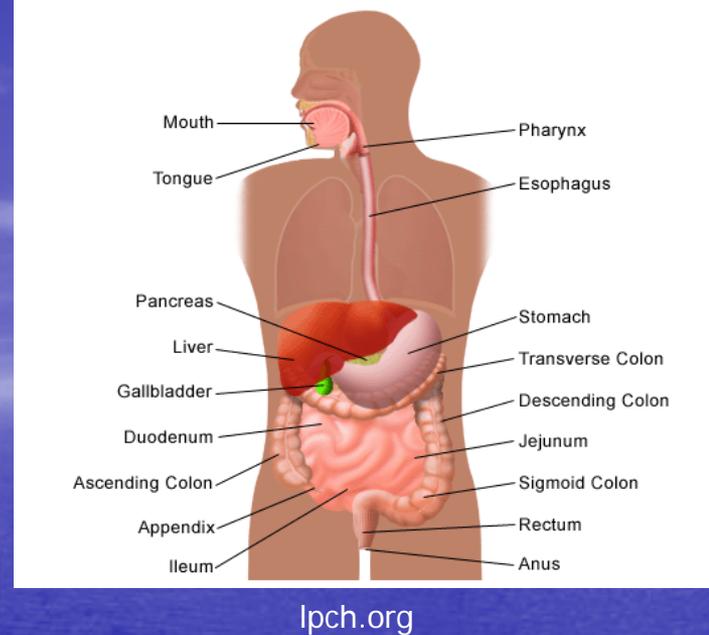


The Human Digestive System

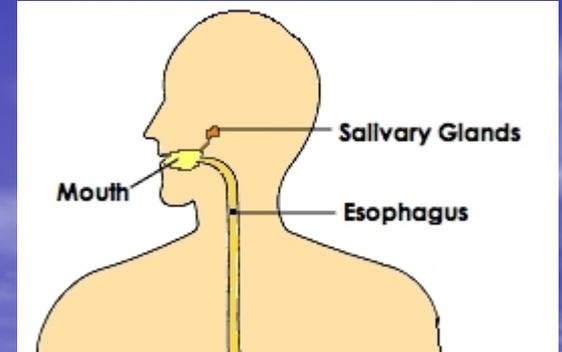
- A complex system of organs and glands that work together to digest (breakdown) food into smaller particles that are absorbed to support the body's nutritional needs.
- The digestive system concentrates the waste/by-products of the digestive process and expels the waste products in the form of feces/stool.
- Most of the digestive system is a tube-like tract that propels the food through the body.

The Digestive System

- The digestive system is a tube-like tract that includes the esophagus, stomach and intestines. This tract runs from the mouth to the anus.
- In addition to the tube-like tract, the salivary glands, liver, pancreas, and gall bladder secrete/store enzymes/chemicals into the tract to facilitate digestion.



The Digestive Process

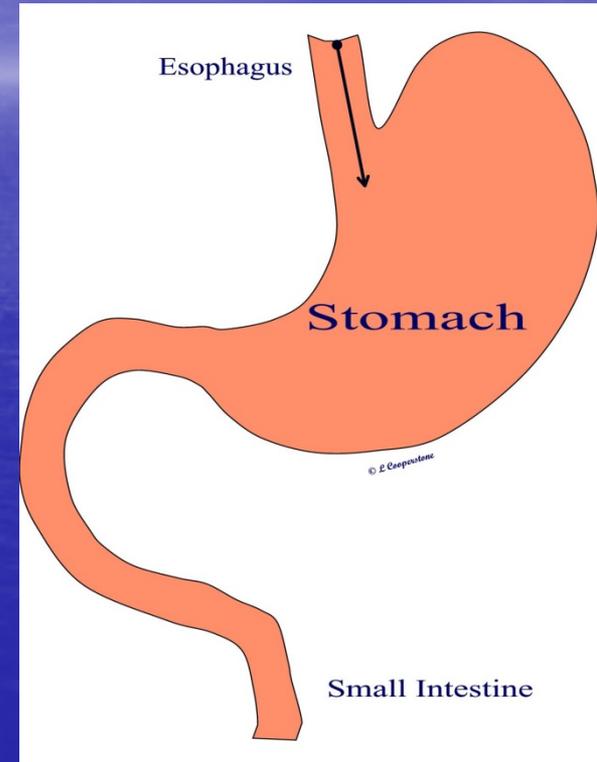


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- In the mouth:
 - Food is partly broken down by the process of chewing and the chemical action of the enzymes secreted by the salivary glands.
 - Once the chewing action is completed, the food bolus is swallowed into the esophagus.
- In the esophagus:
 - The esophagus is a long tube that runs from the mouth to the stomach and uses a wave-like muscle movement to propel food into the stomach.

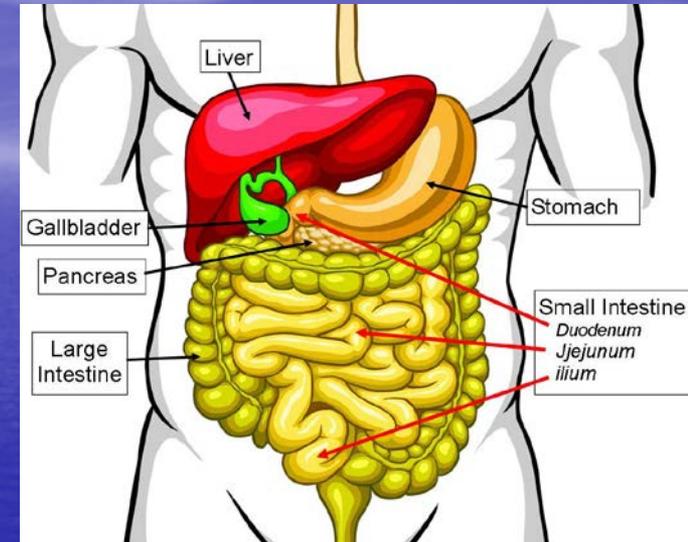
The Digestive Process

- In the stomach:
 - The stomach is a bag-like organ that receives the food from the esophagus.
 - Once in the stomach, the food is churned and mixed with hydrochloric acid. This mixture is called chyme.
 - The chyme leaves the stomach and enters the small intestine.



The Digestive Process

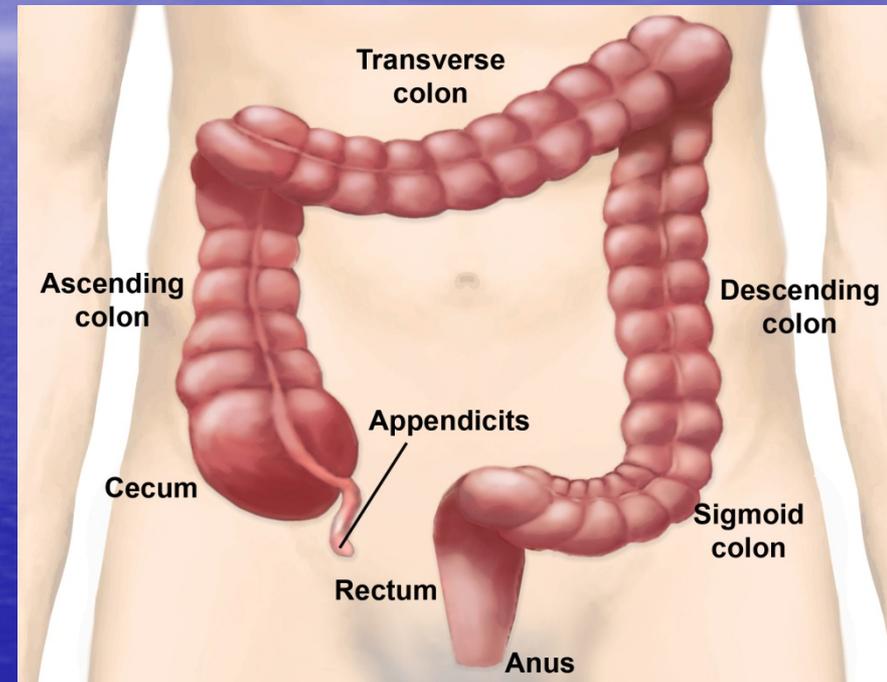
- In the small intestine:
 - From the stomach the food enters
 - the duodenum (the first part of the small intestine), then
 - the jejunum; and then
 - the ileum.
 - In the small intestine bile produced in the liver and stored in the gall bladder, pancreatic enzymes, and other digestive enzymes produced by the inner wall of the small intestine continue the process of breaking down the food.
 - The mixture then enters the large intestine.



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The Digestive Process

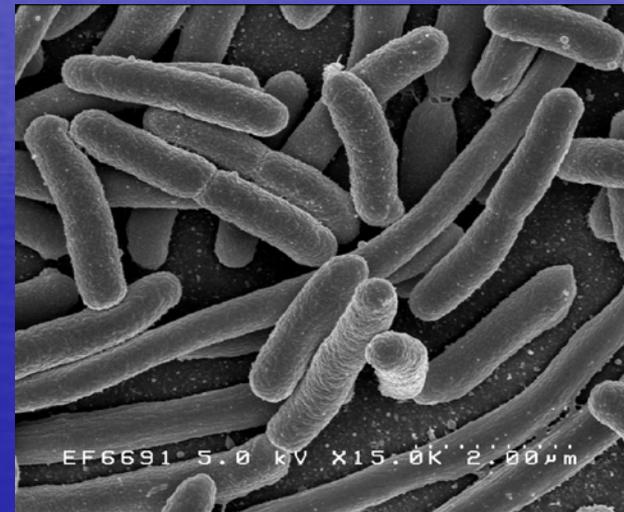
- In the large intestine:
 - The food mixture is propelled through the
 - Cecum
 - Ascending colon
 - Transverse colon
 - Descending colon
 - Sigmoid colon
 - Rectum
 - Anus where it is expelled as feces/stool



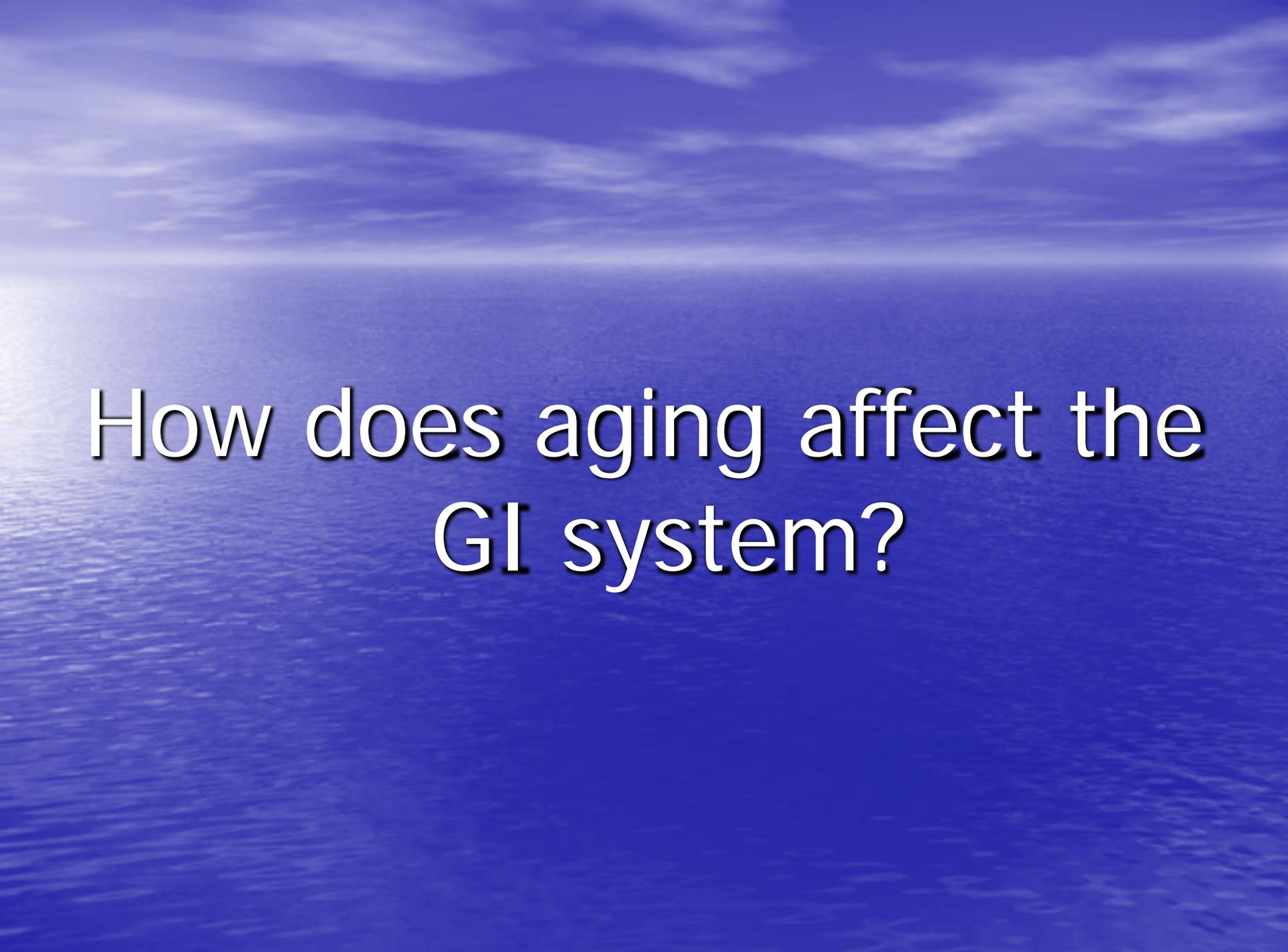
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The Digestive Process

- In the large intestine:
 - Microbes (e.g., Lactobacillus, Klebsiella, e.coli) continue the digestion process.
 - Some water and electrolytes are absorbed/removed from the food mixture.
 - Solid waste is then stored in the rectum until it is excreted via the anus.
 - End product feces/stool/bowel movement.



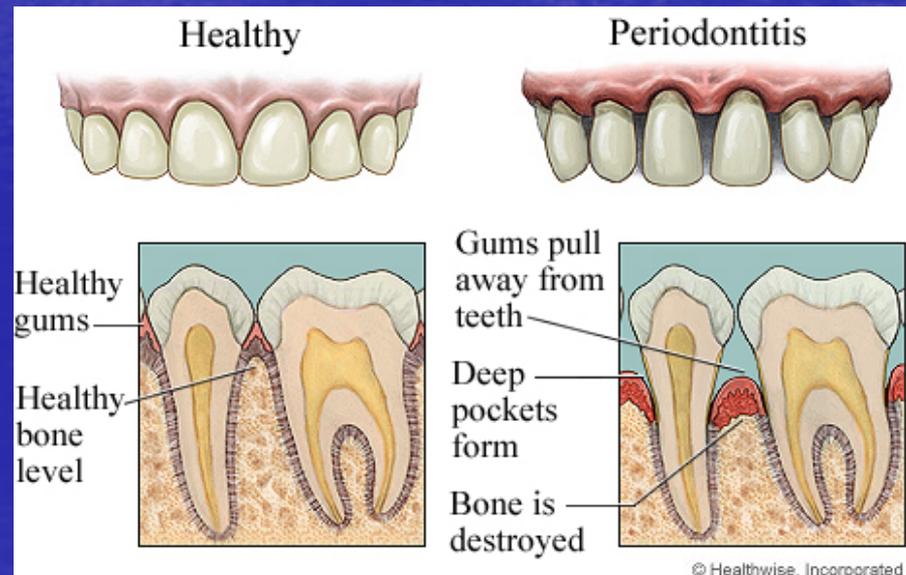
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How does aging affect the
GI system?

Changes Associated with Aging and GI Consequences:

- Tooth enamel and dentin are worn down making a person more prone to cavities and gum disease.
- Chewing of food is affected. This can particularly affect fiber intake.



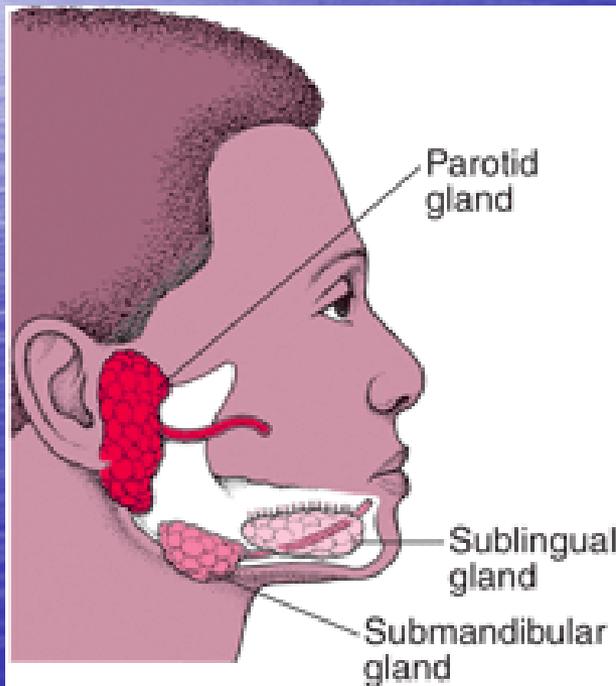
Changes Associated with Aging and GI Consequences:

- Decrease in function of taste buds.
- "Sweet" taste buds are least affected. Healthy diet may not be desired by person.



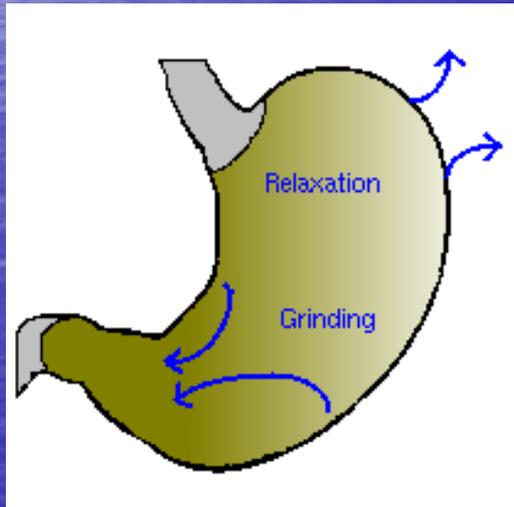
Changes Associated with Aging and GI Consequences:

- Salivary secretion decreases.
- The enzymes found in the saliva are in decreased amounts and affect the first phase of digestion.



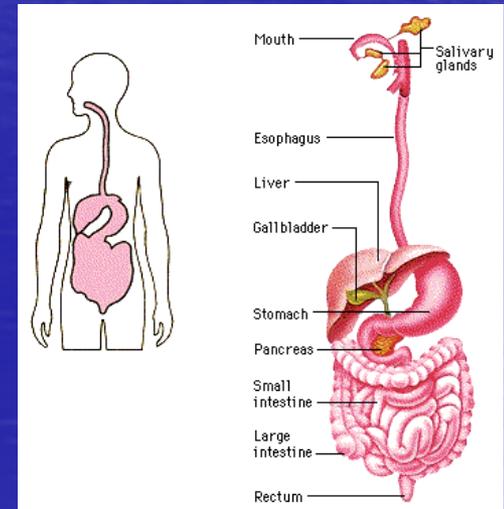
Changes Associated with Aging and GI Consequences:

- Decrease in gastric motility and volume of hydrochloric acid in the gastric juice.
- This decrease affects the digestive process that occurs in the stomach.



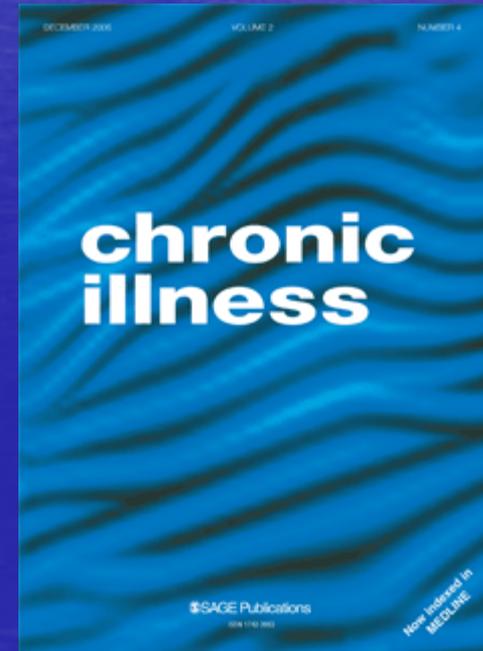
Changes Associated with Aging and GI Consequences:

- Age-related changes can impede absorption due to decreased blood flow to the tissues and the GI tract and changes in gastric pH.
- Nutrient absorption (e.g., carbohydrates, proteins, fats and minerals) can be affected.



Changes Associated with Aging and GI Consequences:

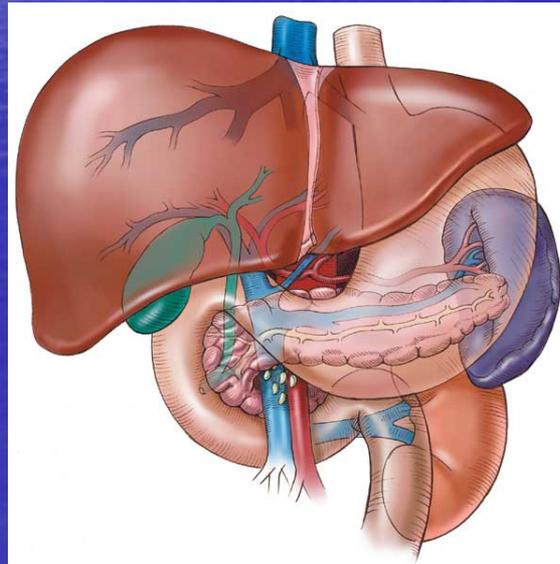
- Chronic illness, use of certain medications and age can cause variations in plasma proteins.
- Can alter medication absorption.



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Changes Associated with Aging and GI Consequences:

- With age and chronic illness, liver size and hepatic blood flow are decreased.
- Medications that are metabolized by the liver should have dose adjustment.



Changes Associated with Aging and GI Consequences:

- Serum albumin is decreased in older adults, creating unique issues with medications that are highly protein-bound, such as levodopa, warfarin, and phenytoin.
- Medication dosages may need to be decreased.



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What is constipation?



What is Constipation and Why Does It Occur?

- Constipation is defined as having a bowel movement fewer than three times a week. The feces is usually, hard, dry and small in size, and difficult to eliminate.



What is Constipation and Why Does It Occur?



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- If constipated, having a bowel movement can be painful. People often experience bloating, straining and a feeling of fullness.
- Constipation occurs when too much water is absorbed from the colon or when the colon's muscle contractions are sluggish.

Two Types of Constipation

- **Idiopathic Constipation:** There is no known cause. Bowel does not respond to standard treatment.
- **Functional Constipation:** The bowel is healthy but not working properly. Often a result of poor dietary habits.

Who is at Risk for Constipation?

- We all are!
- Most common complaint in the U.S.
- 4 million people have frequent constipation
- More common in woman
- More common if over the age of 65



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Why does constipation occur?

- There are many factors and/or diagnoses that place a person at risk for developing constipation.



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- Consider the following >>>>>>>

Not Enough Fluid Intake

- Need to drink 6 – 8 glasses of water a day.
- Caffeinated drinks can cause constipation.



Not Enough Fiber in Diet

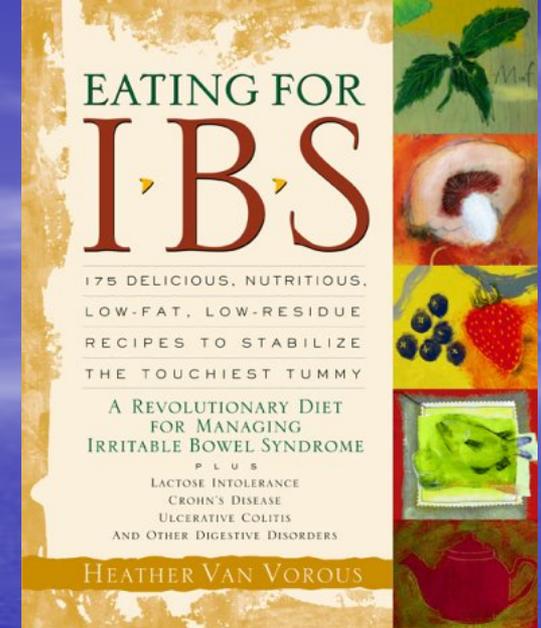


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- Need 20 to 35 grams of fiber a day in diet.
- Fiber refers to "indigestible plant foods." A low fiber diet is a big risk for constipation among older adults.
- Problems in chewing and/or swallowing can contribute to low fiber intake.

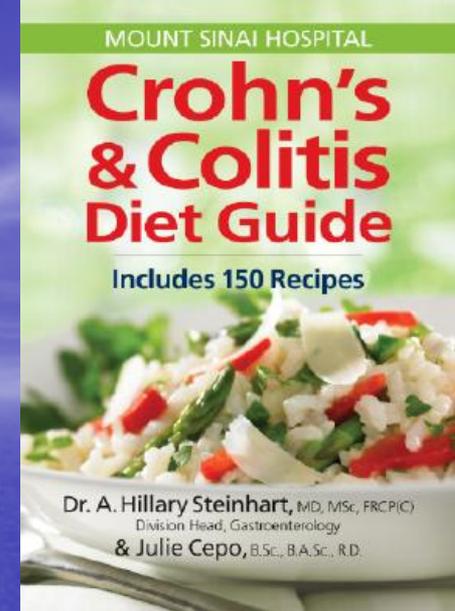
Lack of Dietary Residue

- A low residue diet limits any foods (e.g., fiber) that remain in your digestive tract and contributes to stool formation.
- A low residue diet is ordered when patients need to avoid foods which may obstruct narrowed intestinal areas or irritate an inflamed colon. Such as:
 - During a flare-up in inflammatory bowel disease (Crohn's disease and ulcerative colitis)
 - To reduce friction when there is an obstruction or stricture in the intestines due to cancer.
 - As part of therapy for acute diverticulitis.



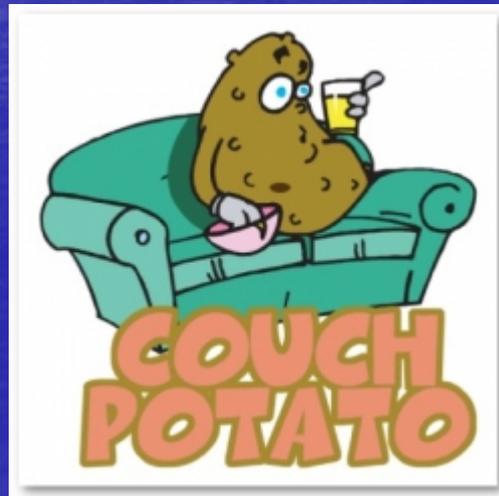
Lack of Dietary Residue

- Achieved by limiting the amount of fiber in the diet. Foods that have a high fiber content are wholegrain cereals, wholemeal bread/biscuits, nuts, seeds, dried fruits, and skin/stalks of fruits and vegetables. Milk should be consumed in moderation.
- Fiber from fruits and vegetables can be reduced by skinning/peeling skins from fruits and vegetables and sieving vegetables after cooking. Alternatively, drink blended fruit and vegetable juices that have been sieved.



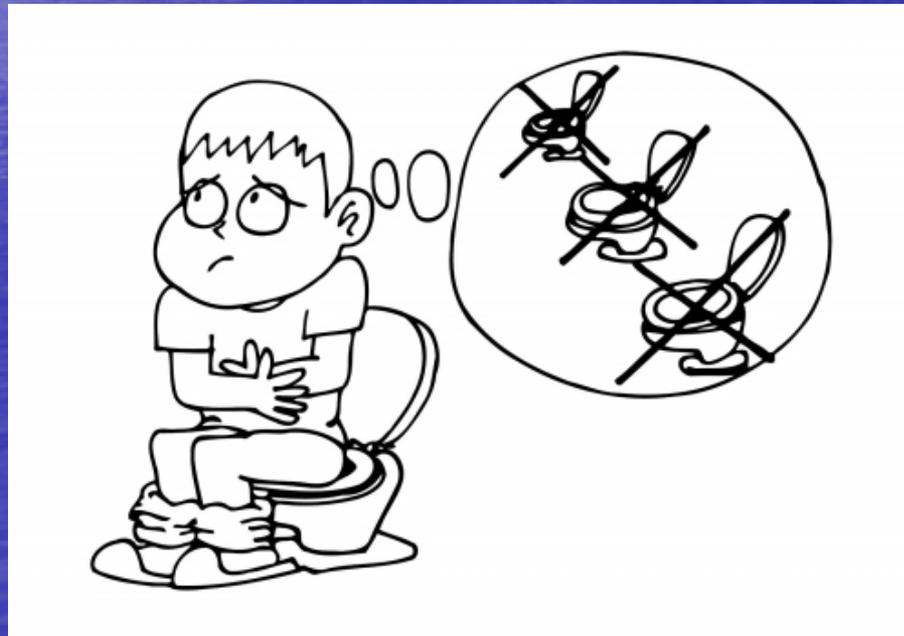
Lack of Physical Activity

- Inability to move independently, decrease in walking, being bed bound or wheelchair bound can contribute to developing constipation.



Ignoring the Urge

- If the urge to defecate is repeatedly ignored, an individual can stop feeling the need to have a bowel movement.



Abuse of Laxatives

- The normal peristaltic movement of the colon is blocked and the colon becomes dependent on laxatives which create an artificial peristaltic movement.



Change of Routine

- Changes in routine (e.g., vacation) are often associated with changes in diet.

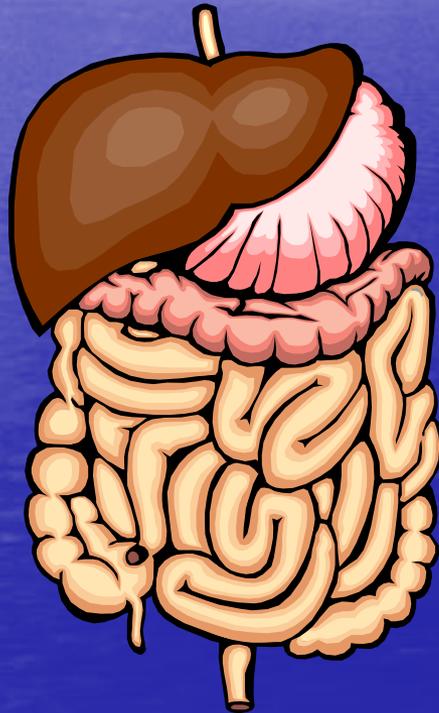


Certain Medications are Associated with Constipation

- Pain medication
- Antacids, that contain aluminum and calcium
- Blood pressure medication
- Anti-parkinson medication
- Antispasmodics
- Antidepressants
- Iron supplements
- Diuretics
- Anticonvulsants



Specific Diagnoses Associated with Constipation:



Neurologic Diagnoses

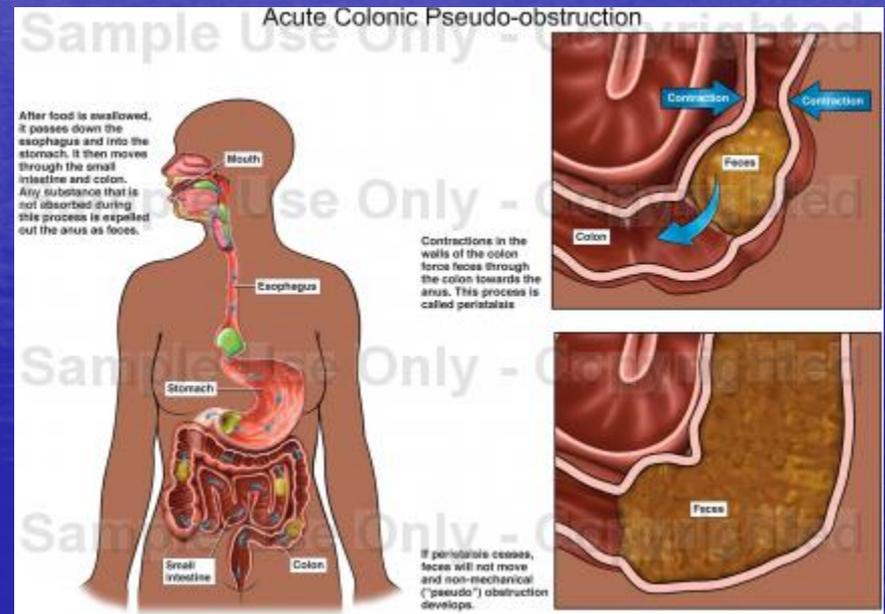
Associated with Constipation:

- Megacolon: Neurogenic disorders of the large intestine in which neural pathways are absent or degenerate.
 - Congenital/Aganglionic Megacolon (Hirschsprung Disease)
 - Acquired megacolon:
 - Idiopathic megacolon
 - Toxic megacolon (associated with ulcerative colitis)
 - Megacolon secondary to infection
 - Medication induced: Risperdal



Neurologic Diagnoses Associated with Constipation:

- Stroke/Cerebral Vascular Accident (CVA),
- Spinal cord injuries,
- Multiple Sclerosis,
- Parkinson disease,
- Chronic idiopathic intestinal pseudo obstruction.



Metabolic and Endocrine Conditions Associated with Constipation:

- Diabetes
- Hypothyroidism
- Uremia
- Hypocalcaemia



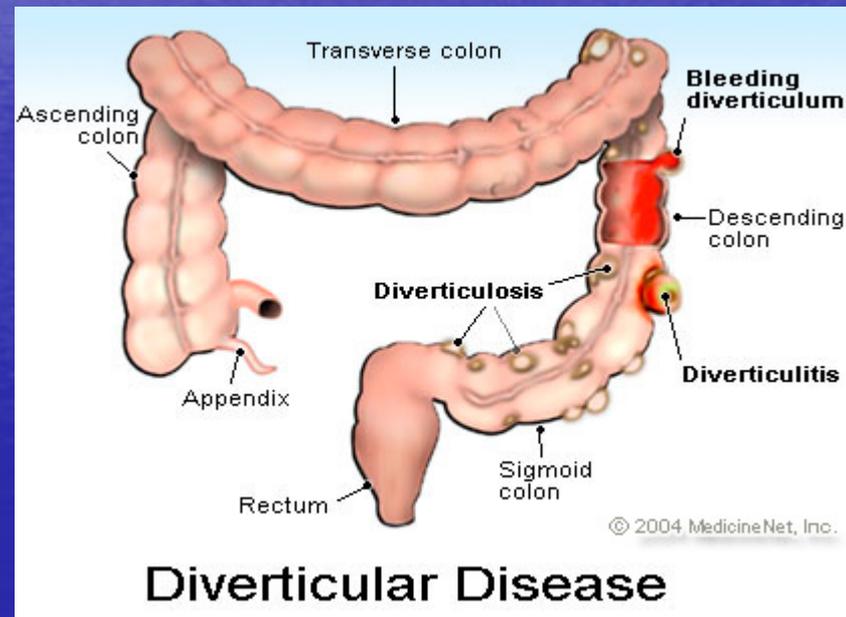
Autoimmune Disorders Associated with Constipation:

- Amyloidosis
- Lupus
- Scleroderma
- Irritable Bowel Syndrome (IBS)



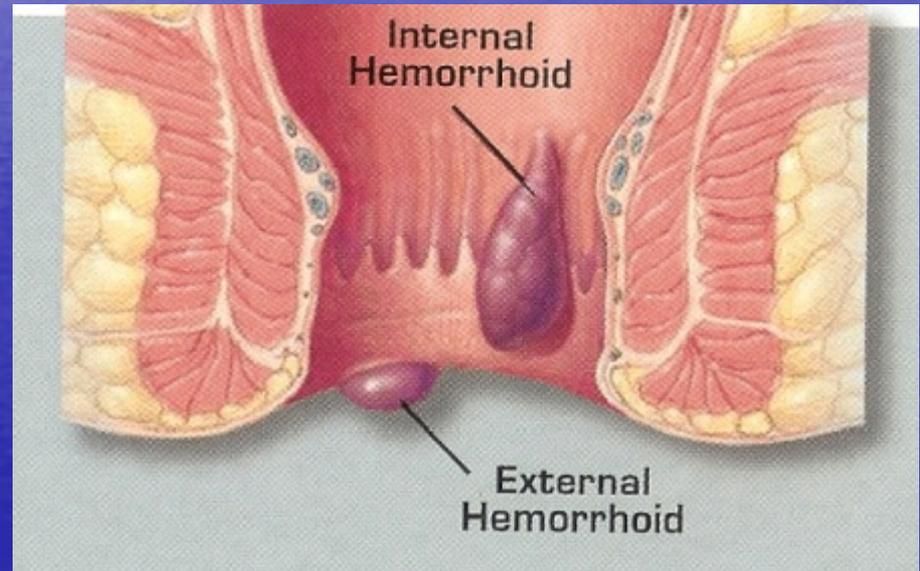
Specific Diagnoses Associated with Constipation:

- Intestinal obstruction
- Scar tissue
- Diverticulosis
- Tumors



Other Causes of Constipation:

- Hemorrhoids
- Fissures
- Fistulas
- Depression
- Anxiety disorder



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Treatments

- Diet: a diet that has 20 - 35 grams of fiber a day. This includes whole grains, bran cereals, fresh fruit, vegetables.
- Bulk forming laxatives: such as Citrucel, Metamucil. They need to be taken with water.



Food sources of fiber include whole wheat, bran, fresh or dried fruits, and vegetables

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Treatments

- Stimulants such as Dulcolax, Senokot.
- Osmotics: This is used for people with idiopathic constipation (e.g., Miralax). People with diabetes should be monitored for electrolyte imbalance.
- At times the bowels need to be retrained. This can include first cleaning out the client, and then starting a bowel regime.



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Treatments

- Stool softeners (e.g., Colace) moisten the stool.
- Enemas
 - Enemas should not be given regularly, unless it is a cone enema that is used as part of a bowel regimen for spinal cord injured clients. This is usually given every day or every other day. After administering, the client is moved to the toilet to have the bowel movement.



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Bowel documentation:

- Documentation of bowel function is critical.
- Use the Bristol Stool Chart for documentation so that documentation is consistent.

Bristol Stool Chart	
Type 1	 Separate hard lumps, like nuts (hard to pass)
Type 2	 Sausage-shaped but lumpy
Type 3	 Like a sausage but with cracks on its surface
Type 4	 Like a sausage or snake, smooth and soft
Type 5	 Soft blobs with clear-cut edges (passed easily)
Type 6	 Fluffy pieces with ragged edges, a mushy stool
Type 7	 Watery, no solid pieces. Entirely Liquid

The problem opposite of constipation is....

Diarrhea

What is diarrhea?

- Diarrhea is the condition of having three or more loose or liquid bowel movements per day.

Common types of diarrhoea
are....

Osmotic Diarrhea:

- Presence of nonabsorbable substance in the intestine that causes excess water to be drawn into the bowel lumen by osmosis.
- Causes:
 - Lactose intolerance
 - Sugar alcohols (e.g., sorbitol)
- Diarrhea usually resolves once offending agent is removed.

Secretory Diarrhea:

- Cause: increase in active secretion, or an inhibition of absorption
- It continues even when there is no oral food intake
- Causes large volume diarrhea by excessive mucosal secretions.

Exudative Diarrhea:

- Exudative diarrhea is characterized by the presence of blood and pus in the stool.
- Causes:
 - Inflammatory bowel disease (e.g., Crohn's disease, ulcerative colitis)
 - Infections (food poisoning)

Motility-Related Diarrhea

- Cause: Rapid movement of food through the intestines (hypermotility) causing insufficient time for sufficient nutrients and water to be absorbed. Caused by:
 - Vagotomy
 - Diabetic Neuropathy
 - Hyperthyroidism
 - Hypermotility after bowel resection allowing less total time for absorption of nutrients.
- Treatment: Antimotility agents (e.g., loperamide).

Small Volume Diarrhea Associated with Fecal Impaction

- FECAL IMPACTION IS A SEVERE FORM OF CONSTIPATION.
- The bowel lining produces secretions to lubricate the impacted feces.
- These secretions go around the impaction and are expelled as a diarrhea-like substance.
- FECAL IMPACTION CAN CAUSE DEATH.

Treatment of Diarrhea

- First, identify the cause
- Ensure adequate fiber in diet
- Anti-diarrheal medication
- Watch for dehydration

The background is a smooth blue gradient. On the left side, there is a bright, glowing area that resembles a sun or light source, with a vertical streak of light extending downwards, creating a shimmering effect on the blue surface. The overall color transitions from a lighter blue on the left to a deeper blue on the right and bottom.

Case Scenarios

Case Scenario Directions

- 1. Read the case scenario.
- 2. Write your name and job title on the answer sheet.
- 3. Considering your agency's policies and procedures, write down the steps you would take according to your position within the agency/DDA.
- 4. Turn in paper.

Case Scenario #1

- Andy, a 48 year old male has lived in an ALU for 20 years. He has a history of intellectual disability, seizures, poor oral care and recently suffered a mild stroke. He now walks with a walker and needs assistance going to the bathroom. He has started to complain of not being hungry, and stated he cannot have a BM.
- What should you do?

Case Scenario #2

- Alicia, a 30 year old spinal cord injured female who also suffered a head injury, is moving into one of your agency's residences. She has been disabled since she was 16. Her mother was her primary care giver, but she is now not able to care for her due to her own health issues.

Continuation of Scenario #2

While being cared for by her mother, Alicia was on a bowel regime and received a suppository every other day. Over the past 2 weeks, she has refused the suppository and she has cut back on her fluid intake. She states that she has lost her appetite.

What should you do?

Further Directions

- Please complete the post knowledge assessment.
- Thank you for participating in this learning experience.
- We hope that this was a easy way to learn!

References

- McCance, Kathryn., Huether, Sue, E.,
*Pathophysiology The Biological Basis for
Disease in Adults and Children.* Mosby
Company. Phila:2009.