Digestive needs

A & P review GI tract

- The nutritional (gastrointestinal) system

Structure of GI Tract

- Four distinct layers
  - Mucosa-innermost layer
  - Submucosa- contains glands, blood vessels, and lymph nodes
  - Muscular layer- smooth muscle-circular or longitudinal
  - Connective tissue serosa layer- uppermost
Structure of GI tract

- Esophagus
  - Upper third has striated (voluntary) muscle
  - Middle third has both types of muscle
  - Lower third has only smooth muscle

- Esophageal sphincters
  - Upper- prevents entry of tracheal air
  - Lower- prevents reflux of gastric contents (aspiration)
GERD

Structure of GI tract

- Stomach
  - Fundus
  - Body
  - Antrum
- Gastric contents empty from the antrum through the pylorus into the duodenum.
Structure of GI tract

- Small intestine
  - Duodenum- 25cm
  - Jejunum- 2.5m
  - Ileum- 3.6m

Structure of GI tract

- Large intestine
  - 1.5 meter in length
  - Cecum- pouch where s. and l. intestine join
  - Ascending
  - Transverse
  - Descending
  - Sigmoid colon
  - Rectum

Structure of GI tract

- GI blood supply
  - Arterial blood enters thru branches of major arteries
  - Venous drainage, is through the hepatic portal vein.
Structure of GI tract

- Neural regulation
  - Enteric nervous system: regulates motility and secretion along the entire GI tract
  - Sympathetic: inhibit activity in enteric plexuses
    • Constrict GI system blood vessels
    • Decrease glandular secretions

- Parasympathetic: vagus nerve is primary nerve supply to the GI tract
  - Stimulate motor activity
  - Stimulate secretory activity
  - Stimulate endocrine secretions

Function of GI tract

- Motility
- Secretion
- Digestion
- Absorption
Function of GI tract

• Motility
  – Smooth muscle- pacemakers set slow-wave contractions
  – Nerves and hormones alter this rate and therefore, GI motility
  – Peristalsis- organized wave of contraction of the longitudinal muscle layer

Function of GI tract

• Swallowing- three phases
  – Oral (voluntary) phase
  – Pharyngeal (involuntary) phase
  – Esophageal (involuntary) phase
Function of GI tract

• Stomach
  – Occur after feeding at a rate of three per minute
  – Antrum has strong contractions that fragment food into smaller particles and mix the food with gastric secretions to initiate digestion.

Function of GI tract

• Gastroduodenal junction
  – Pylorus and terminal end of antrum contract simultaneously
  – The rate of gastric emptying must match the duodenal buffering ability or acid may damage duodenal mucosa

Function of GI tract

• Small intestine
  – Peristalsis moves chyme aborally 10cm per contraction.
  – Chyme takes 2-4 hours to move 6 meters
Function of GI tract

• Small intestine
  – Peristalsis moves chyme aborally 10cm per contraction.
  – Chyme takes 2-4 hours to move 6 meters

Function of GI tract

• Large intestine
  – Takes 1-3 days to complete its passage through the LI
  – Sodium and water absorbed
  – Bacteria consume more nutrients and release some vitamins (K)

Function of GI tract

• Vomiting
  9 things occur during the vomiting process.
### Functions of GI tract

- **Secretions**
  - Aid in absorption by helping digest foods to absorbable components
  
  **Types**
  - lubricants
  - ions
  - absorption facilitators
  - bile

### Functions of GI tract

- **Digestion and absorption**
  - Carbohydrates - D & A occurs primarily in duodenum and jejunum.
  - Protein - stomach and small intestine for digestion, abs. in the duodenum and jejunum
  - Lipids - duodenum lipids emulsified by bile acids and digested to form micelles with bile acids. The micelles are absorbed at the intestinal brush border.

### Functions of GI tract

- Villi are the functional unit for absorption. 90% of absorption occurs in the small intestine through active transport.
Function of GI tract

- Water and electrolytes- 99% of ingested water is absorbed.
  - Greatest in the jejunum and least in the colon.

GI assessment

- Screening of nutritional health
  - Ask about dietary intake
  - 24 hour recall
  - Ask for a 1-3 day food diary

GI assessment

- Malnutrition
  - Primary- occurs when adequate nutrition is not delivered to the upper GI tract over an extended period of time.
  - Secondary- occurs when the upper GI tract fails to absorb, metabolize or use nutrients
GI assessment

- Chronic pancreatitis
- Short-bowel syndrome
- Pressure ulcers
- Cancer
- AIDS
- Prior gastric surgery

History

- Biographical data-
  - Age
  - Gender
  - Religious affiliation
  - Marital status

History

- Chief complaint
  - Nausea, vomiting
  - Indigestion
  - Abdominal pain
  - Diarrhea
  - Weight changes, appetite
History

• Symptom analysis
  – When does N or V occur? How long does it last? Relation to food intake
  – Indigestion- “burping” or burning, relation to food intake, type of foods
  – Abdominal pain- rapid or gradual in onset, intensity, radiate?, duration, worsen or improve with movement,

History

• Abdominal pain
  – Bowel obstruction- intermittent, colicky pain
  – Bowel sounds may progress from high pitch to absent
  – Peritoneal inflammation- steady, aching pain directly over area of inflammation. Pain increases with motion
  – Vascular catastrophe (AAA or infarction)- may be preceded by 2-3 days of mild-mod. pain followed by severe abdominal pain and manifestations of shock. Back and flank pain are common with aortic aneurysms.

History

• Diarrhea- how many stools? How much? Stools liquid or solid? What color? pain with defecation?
• Appetite and weight change- describe appetite, and change, change in taste, smell, activity level, mood states? Weight gain, loss intentional.
Past health history

- Major illnesses and hospitalizations
- Medications
- Allergies

Family health history

- Genetics and family environment play a role in the development of some GI disorders
  - Ulcerative colitis
  - Crohn’s disease
  - Alcoholism
  - Liver disease
  - Cancer
  - Peptic ulcer disease
  - Irritable bowel disease

Psychosocial history

- Occupation
- Diet
Review of systems

- Assess condition of mouth
- Dental habits
- Dentures
- Swallowing

Physical examination

- Height and weight
- Body mass index
- Frame size
- Circumferential measurements

Physical examination

- Mouth
  - Inspection and palpation
  - Symmetry, color, hydration, lesions, nodules.
  - Teeth for malocclusion or missing teeth
  - Check for loose teeth, masses, swelling, tenderness
Physical examination

- Abdomen
  - Ask client to void first
  - Supine position
  - Small pillow under knees

Physical examination

- Inspection
  - Skin, contour, hair distribution
  - Notice scars, striae, petechia, rashes
  - At eye level, look for peristalsis movements or pulsations

Physical examination

- Auscultation
  - Beginning in RLQ
  - Clockwise to each quadrant
  - Frequency and character
  - Vascular sounds
Palpation

- Non-tender areas first
- Light palpation
- Masses and areas of tenderness
- Guarding, rigidity
- Deep palpation

Diagnostic tests

- Laboratory tests
- Radiography
- Ultrasonography
- Endoscopy
- Exfoliative cytologic analysis
- Gastric analysis

Management of clients with malnutrition

- Protein-energy malnutrition
  - Need is not supplied through dietary intake
- Syndromes
  - Kwashiorkor-chronic protein deficiency
  - Marasmus- prolonged caloric deficiency
Malnutrition

- Primary protein-energy malnutrition (PEM)
  - Poor food intake
    - Developing nations, following war or natural disasters,
    - 800 million people worldwide are undernourished
    - Infants, pregnant/lactating females, and older adults are at the greatest risk

Malnutrition

- Secondary PEM- causes
  - Decreased food intake
  - Decreased nutrient absorption
  - Increased nutrient losses
  - Increased nutrient requirements
Malnutrition

• Etiology and risk factors
  – Socioeconomic
  – Physiologic changes
  – Medical therapies

Malnutrition

• Pathophysiology
  – Total supply of nutrients is less than the body’s requirement
  – Unintentional weight loss of 5% in 1 month or 10% in 6 months

Malnutrition

• Clinical manifestations
  – Hair loss or dull, dry hair
  – Dry, bruised skin
  – Brittle nails
  – Periodontal disease, bleeding gums
  – Anemia
  – Cheilosis
Malnutrition

- Abnormal lab values
  - Decreased Hg, BUN, creatinine, albumin, and prealbumin
  - Related to protein deficiency
  - Prealbumin is most sensitive indicator of protein deficiency because of its short half life of 2 days.

Malnutrition

- Medical management
  - Identify the high risk patients
  - Determine energy needs using basal energy expenditure formula
  - The protein needs of a hospitalized patient may be nearly twice those of normal needs
Malnutrition

• Determine route of feeding
  – Supplements to boost calories
  – Enteral feedings used when unable to take oral fluids
  – Parenteral feeding when GI tract is non functional

Malnutrition

• Nursing management
  – Continued monitoring of clients nutritional status
  – ND- Feeding self-care deficit related to impaired motor function, impaired cognitive function, sensory-perceptual alterations, or decreased appetite

Malnutrition

• Interventions
  – Improve nutritional intake
    • Dietician consult, improve menu items
  – Increase appetite
    • Pleasant environment, adequate pain control,
    • Regular exercise, oral care,
  – Increased social interaction
  – Minimize sensory-perceptual deficits
  – Minimize the impact of neuromuscular deficits
  – Minimize the impact of cognitive impairments
  – Minimize fatigue
Malnutrition

• Impaired swallowing
  – Team approach: physicians, PT, OT, Speech, nurses

Malnutrition

• Assess swallowing
  – Assess LOC
  – Assess gag reflex
  – Have the client produce an audible cough
  – Have the client produce a voluntary swallow

Malnutrition

• Swallowing techniques
  – Calm quiet environment
  – Assist in placing food bolus in unaffected side of mouth and toward pharynx
  – Tilt chin down to decrease risk of aspiration
  – Massage throat on affected side
  – Watch the thyroid cartilage for swallowing
  – Inspect the mouth before more food
  – Allow sufficient time between mouthfuls
Malnutrition

- Enteral nutrition
  - Tube feeding
  - Contraindicated in complete intestinal obstruction, severe ileus, severe diarrhea, malabsorption syndrome
  - If the gut works, use it

Malnutrition

- Enteral access
  - NG- into the stomach
  - Gastrostomy
  - Jejunal tube (J-tube)-jejunum

Malnutrition

- Short term- NG tubes
- Small bore enteral feeding tubes are made of silicone or polyurethane (softer)
- Long-term- G-tubes, J-tubes are placed surgically, endoscopically.
- PEG tubes- most common long term
Malnutrition

- Nursing management of enteral nutrition
  - Monitor for aspiration
  - Prevent contamination of formula and delivery systems
  - Assess tube location
  - Administer feedings
  - Prevent aspiration
  - Maintain enteral access

Malnutrition

- Parenteral nutrition
  - Clinical indications
    - Short bowel syndrome
    - Severe prolonged radiation enteritis
    - High output fistulae
    - Motility disorders
      - Ileus, persistent vomiting

Malnutrition

- Parenteral feedings
  - Consist of carbohydrates- 50-70%
  - Fat emulsions- 10-30%
  - Amino acids
  - Fluids, electrolytes, vitamins and trace elements
Malnutrition

• Vascular access
  – Central venous line
  – Must be positioned in a high flow vein
  – Superior or inferior vena cava

Malnutrition

• Interventions
  – Administer PN
    • Check solution for exp. date, correct ingredients, appearance of solution
    • Must use a pump
  – Monitor blood glucose levels
    • Every 6 hours initially, then q 24 hours.
  – Observe for allergy to PN components
  – Maintain vascular access
  – Prevent infection
  – Provide dressing changes

Malnutrition

• Evaluate interventions
  – Assess tolerance, fluid status and GI status
  – Monitor VS, lab tests, and function of nutritional access device
  – Therapies are routinely used in home settings.
Eating disorders

- Obesity
  - Characterized by an excess accumulation of fat
  - Causes are complex and pervasive
  - Defined by BMI greater than 30kg/m²

Eating disorders - obesity

- Environmental
- Genetic tendency
- Socioeconomic factors
- Ethnic disparities

Eating disorders - obesity

- Clinical manifestations
  - Type 2 diabetes
  - Cardiovascular disease
  - Hypertension
  - Stroke, sleep apnea
  - Cancers-breast, colon and prostate
Eating disorders-obesity

• Medical management
  – Skin and wound problems are common
  – Diet, exercise, occasionally medication
  – Diet that provides 500-1000 calories less than expenditure is ideal for 1-2 pound per week weight loss.
  – Lifestyle modifications

Eating disorders-obesity

• Surgical management
  – Gastric restrictive
  – Restrictive plus malabsorptive

Eating disorders- anorexia and bulimia nervosa

• Risk factors
  – Young women
  – Women 10 times greater than men
  – More prevalent in Western cultures
  – Low self-esteem
Eating disorders-anorexia and bulimia

• Similar to starvation
  – Body uses fat stores
  – Shifts in fluid and electrolyte balance
  – Can be life threatening
  – Alterations in the metabolism of insulin, thyroid hormones and catecholamines

Eating disorders-anorexia and bulimia

• Clinical manifestations
  – Clients may limit themselves to 200-500 calories/day
  – Dry skin, pallor, bradycardia, hypotension
  – Intolerance to cold
  – Constipation
  – Amenorrhea

Eating disorders-anorexia and bulimia

• Bulimia
  – Eating and vomiting usually in late afternoon
  – Abuse of laxatives and diuretics
  – Depression symptoms
  – Erosion of tooth enamel
Eating disorders—anorexia and bulimia

- Medical management
  - Psychological as well as nutritional components
  - Enteral and parenteral therapy may be needed in serious cases

Management of Clients with Ingestive Disorders

- Problems occur in the oral cavity or esophagus
- Dental disorders

Dental disorders

- Preserve client’s own teeth as long as possible
- Natural teeth are more functional in masticating food than dentures
- Effective mastication helps promote efficient digestion
- Efficient digestion results in healthy GI function and general health
Dental disorders

- Most common cause of tooth loss is dental decay and periodontal disease
- Best treatment is prevention
- Periodontal disease caused by plaque formation and bacterial colonization
- Inflammation destroys the underlying tissues and separates the gingiva from the tooth.
- Periodontitis the inflammation extends from the gum into the alveolar bone and ligament, destroying supporting structures.

Oral disorders

- Stomatitis
  - Mechanical or chemical
  - Primary- aphthous stomatitis (canker sore)
    - Herpes simplex
  - Secondary- opportunistic infection, bone marrow disorders, nutritional disorders, chemotherapy, radiation
Oral disorders

• Aphthous stomatitis
  – Canker sores - recurrent, small ulcerated.
  – Cause unknown but:
    • Maybe emotional stress, trauma, vitamin def.,
    • Food and drug allergies, viral infections

Oral disorders

Oral disorders

• Herpes simplex
  – 90% of population infected with primary herpes simplex by age 5
  – Secondary appears in clients receiving immunosuppressive drugs and HIV clients
  – Any infection can reactivate the virus
Oral disorders

• Vincent’s angina (trench mouth)
  – Acute bacterial infection of the gingivae caused by the resident flora of the mouth
  – Caused by poor oral hygiene, increased age, DM, lack of sleep, viral infections
  – Not contagious

Oral disorders

• Candidiasis (moniliasis, thrush)
  • Yeast like fungus part of the normal flora
  • Immunosuppressed clients
  • High dose or long term antibiotic therapy

Oral disorders

• Clinical manifestations
  – White patches on the tongue, palate, and buccal mucosa
  – Adhere firmly to tissue
Candidiasis

Oral disorders

- Medical management- candidiasis
  - Topical antifungal agents as well as other topical agents to alleviate infections and provide pain reduction
  - Mendelsohn’s mouthwash- antifungal, antibiotic and analgesic

Tumors of the oral cavity

- Benign
  - Fibromas, lipomas, neurofibromas and hemangiomas
  - Cause pressure
  - Excised if cause functional or cosmetic problem
Tumors of the oral cavity

• Premalignant

• Leukoplakia
  – Yellow-white or gray-white lesion
  – Any region of mouth.
  – Leathery surface
  – Clearly defined borders
  – Men twice as frequently as women

Tumors of the oral cavity

• Erythroplakia
  – Red, velvety appearing patch that commonly indicates early squamous cell carcinoma
  – Most frequently 50-60 years of age
  – Men and women the same

Tumors of the oral cavity

• Malignant tumors
  – Most commonly seen at 40-50 years old
  – Men more than women
  – Associated with long alcohol consumption and tobacco use
Tumors of the oral cavity

• Basal cell carcinoma
  – Second most common cancer of the oral cavity
  – Occurs on the lips
  – Characteristic pearly border
  – Due to excessive exposure to sunlight

Tumors of oral cavity

• Squamous cell carcinoma
  – Leading type of oral cancer
  – Older than 45 years of age
  – Lower lip and tongue
  – Sore or lesion that does not heal

Tumors of the oral cavity

• Medical management
  – Inhibit tumor growth
    • Survival depends on site and staging
• Radiation therapy
• Chemotherapy
Tumors of the oral cavity

• Nursing management
  – Interventions
    • Avoid oral irritants
    • Promote comfort
    • Promote nutrition
    • Relieve mouth dryness

Tumors of the oral cavity

• Surgical management
  – Local excision of small tumors
  – Extensive surgery for invasive tumors
    • Radical and modified radical neck dissection
    • Requires extensive preparation of the client for surgery

Tumors of the oral cavity

• Nursing management
  – Make sure client understands implications of surgery
  – Assess rehabilitative needs
  – Speech therapy, coping with disfigurement, depression
Tumors of the oral cavity

• Interventions
  – Maintain airway
    • Semi to high Fowler’s position
  – Provide wound care
  – Monitor for bleeding
  – Administer supplemental nutrition
  – Discuss eating modifications

Tumors of the oral cavity

• Interventions- impaired verbal communications
  – Promote alternate forms of communication
    • Paper/pencil, magic slate, laptop
    • Nurses’ manner should communicate acceptance, compassion, and caring.
  – Relieve anxiety
    • Check on them frequently
    • Respond promptly
    • Label intercom re: client’s inability to speak

Tumors of the oral cavity

• Client should heal within 6 weeks to 3 months.
• Need tremendous emotional support
• Self-feed via tube until healing occurs
• Home health referral for respiratory support, suctioning nutritional support and wound and trach care
### Disorders of the salivary gland

- **Parotitis** - inflammation of the parotid glands
  - Caused by inactivity of the glands due to certain drugs (diuretics), prolonged NG intubation, and lack of oral intake.
  - **Calculi** - stones form in salivary glands
  - **Tumors** - most are benign in salivary glands

### Disorders of the esophagus

- **Dysphagia**
  - Mechanical obstruction
  - Cardiovascular abnormalities
  - Neurologic diseases
  - Other causes

- **Regurgitation**
  - Ejection of small amounts of chyme or gastric juice from the mouth without nausea
  - Immediately after swallowing results from structural or motor abnormalities in the LES
Disorders of the esophagus

• Acute pain-(odynophagia) pain with swallowing
  – Can be sharp, stabbing, crushing, knife-like
  – May be constant or only with swallowing (esophageal spasm)
  – Reflux disease
  – Radiation
  – Viral infection

Disorders of the esophagus

• Heartburn or pyrosis
  – Substernal, midline burning tends to radiate, generally in waves, upward to the neck, resulting from abnormalities of the LES
  – Occurs in obesity, postural changes, during pregnancy, or alcohol intake.

Disorders of esophagus

• Achalasia
  – Progressively increasing dysphagia
  – Unknown cause, no risk factors, occurs in 20s and 30s
  – Impaired mobility of the lower 2/3 of esophagus.
  – LES fails to relax normally with swallowing
Disorders of esophagus

• Clinical manifestations
  – Dysphagia
  – Substernal pain
  – Regurgitation of undigested food
  – URI, emotional disturbance, pregnancy, obesity exacerbate problem

Disorders of esophagus

• Medical management
  – Relieve manifestations
    • PEG tube, or surgical procedures
  – Administer medications
    • Relax the sphincter (anticholinergic drugs)
    • Antacids, H2 receptor antagonists, and proton pump inhibitors
  – Modify diet
  – Alternate positions

Disorders of esophagus

• Nursing management
  – Consult with client about dietary habits
  – Possibility of PEG tube placement
  – Pain eased thru medications
Disorders of the esophagus

• Surgical management
  – Dilation of LES
  – PEG placement

Disorders of the esophagus

• GERD
  – Results from backward flow of gastric contents into the esophagus
  – Causes reflux esophagitis
  – Associated with hiatal hernia

Disorders of the esophagus

• GERD
  – Cause
    • An alteration in the innervation of the gastroesophageal sphincter
    • Displacement of the angle of the GE junction
    • Incompetent LES
Disorders of the esophagus

- Risk factors
  - Obesity
  - Weight gain
  - Pregnancy
  - Chewing tobacco, smoking
  - High fat foods
  - Theophylline
  - Caffeine, chocolate

Disorders of esophagus

- Discomfort usually begins after meals
- Increased intraabdominal pressure
- Lying or supine positions

Disorders of esophagus

- Medical management
  - NSAIDs, anticholinergic drugs, calcium channel blockers, theophylline should be avoided
  - Lifestyle and diet changes
  - Endoluminal gastroplication
Disorders of the esophagus

• Hiatal hernia
  – Cardiac sphincter becomes enlarged, allowing a part of the stomach to pass into the thoracic cavity.
    • Sliding (type I)
    • Rolling (type II)

Disorders of the esophagus

• Causes and risk factors
  – Related to muscle weakness in esophageal hiatus, loosens the esophageal support
  – Aging, trauma, surgery
  – Anything that increases intraabdominally pressure such as lifting, coughing, pregnancy, obesity

Disorders of the esophagus

• Clinical manifestation
  – Heartburn 30-60 minutes after a meal
  – Reflux
  – Fullness after eating, difficulty breathing
  – Worse when lying down
Hiatal hernias

Disorders of esophagus

• Postoperative care
  – Prevent respiratory complications
  – Prevent Gas-bloat syndrome
Disorders of esophagus

- Diverticula
  - Sac like out pouching in one or more layers of the esophagus
  - Food becomes trapped
  - Rare

Disorders of the esophagus

- Esophageal cancer
  - Squamous cell cancer or adenocarcinoma
  - Causes could be environmental
    - Heavy smoking, nutritional deficiencies, alcohol
  - Chronic irritation from other problems such as achalasia, hiatal hernia, and stricture

Disorders of esophagus

- Clinical manifestations
  - Swallowing problems
  - Usually by then it has invaded the deeper layers of the esophagus
Disorders of the esophagus

• Medical management
  – Inhibit tumor growth
  – Radiation therapy
  – Chemotherapy
  – Photodynamic therapy
  – Maintain nutrition

Disorders of the esophagus

• Nursing management
  – Assess nutritional status, dysphagia
  – Encourage soft food
  – Assess odynophagia, regurgitation, chronic cough, increased secretions and hoarseness

Disorders of the esophagus

• Interventions
  – Monitor nutritional status, weight changes, I & O
  – Teach diet changes
  – Assess skin around feeding tube
  – Provide emotional support
  – Poor prognosis frequently
<table>
<thead>
<tr>
<th>Disorders of the esophagus</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Vascular disorders</td>
</tr>
<tr>
<td>– Esophageal varices</td>
</tr>
<tr>
<td>• Trauma</td>
</tr>
<tr>
<td>– Chemical burns</td>
</tr>
<tr>
<td>– Foreign bodies</td>
</tr>
<tr>
<td>– External forces</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management of clients with digestive disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clinical manifestation</td>
</tr>
<tr>
<td>– Pain</td>
</tr>
<tr>
<td>– Anorexia</td>
</tr>
<tr>
<td>– Nausea and vomiting</td>
</tr>
<tr>
<td>– Bleeding</td>
</tr>
<tr>
<td>– Diarrhea</td>
</tr>
<tr>
<td>– Belching flatulence</td>
</tr>
<tr>
<td>– Indigestion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gastrointestinal intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Used for</td>
</tr>
<tr>
<td>– Decompression</td>
</tr>
<tr>
<td>– Lavage</td>
</tr>
<tr>
<td>– Gastric analysis</td>
</tr>
<tr>
<td>– Tube feedings</td>
</tr>
</tbody>
</table>
Gastrointestinal intubation

- Types of tubes
  - Short tubes
    - Levin tubes
    - Salem sump tubes

Gastrointestinal intubation

- Medium tubes
  - Variety of nasoduodenal tubes
  - Extend from nose to the duodenum and are for short-term feeding.
  - Weighted tip-less likely to cause aspiration

Gastrointestinal intubation

- Long tubes
  - Extend into small bowel, sometimes the entire length
  - Not used much
  - Types- Miller-Abbott Tube
  - Cantor tube
  - Harris tube
Gastrointestinal intubation

- Other tubes
  - G-tubes or J-tubes are for long term enteral feedings.
  - PEG tubes or PEJ tubes also

Gastrointestinal intubation

- Insertion of tubes
  - High Fowler’s position
  - Measure the distance on the tube
  - Lubricate and gently insert
  - Have the client swallow
  - Verify placement

Gastrointestinal intubation

- Suctioning
  - Ensure that gastric mucosa is not traumatized
  - Intermittent suction is used
Gastrointestinal intubation

- Nursing management
  - Comfort
  - Clean and lubricate nares
  - Tape the tube to prevent irritation of nares
  - Frequent oral hygiene
  - Chew gum or ice chips
  - Request order for anesthetic mouthrinse or lozenges

Gastritis

- Acute gastritis
  - Inflammation of gastric mucosa
  - Risk factors - seen with nausea and vomiting, bleeding, malaise, anorexia
  - Aspirin and NSAIDs, digitalis, chemo, steroids, acute alcoholism and food poisoning.

Gastritis

- Health promotion behaviors
  - Limit use of NSAIDs, alcohol, caffeine
  - Avoid nicotine products, smoking

- Health maintenance behaviors
  - Use of enteric coated aspirin, COX-2 inhibitors, proton pump inhibitors to block gastric acid production
Gastritis

• Mucosal lining of the stomach acts as a barrier to protect it from the gastric acid
• When barrier is penetrated, gastritis occurs

Gastritis

• Clinical manifestations
  – Epigastric discomfort
  – Abdominal tenderness
  – Reflux
  – Nausea and vomiting
  – Hematemesis

Gastritis

• Medical management
  – Removal of cause and treat symptoms
  – Withhold foods and fluid until N & V subside
Gastritis

• Chronic gastritis
  – Superficial gastritis
  – Atrophic gastritis
  – Hypertrophic gastritis

Gastritis

• Risk factors
  – Peptic ulcer disease (PUD)
  – Infection with Helicobacter pylori bacteria
  – Gastric surgery
  – Others similar to acute gastritis
  – Age

Gastritis

• Mucosal lining becomes thickened and erythematous and then thin and atrophic.
• Loss of function of parietal cells
• Decreased acid secretion leads to inability to absorb vitamin B12.
• Also a risk factor for gastric cancer
Gastritis

• Clinical manifestations
  – Vague
  – Anorexia
  – Feeling of fullness
  – Nausea
  – Intolerance to spicy foods
  – Epigastric pain

• Complications
  – Bleeding
  – Pernicious anemia
  – Gastric cancer

• Nursing management
  – Reduce pain
    • Teach about foods that worsen, avoid smoking alcohol
    • Gaviscon is best antacid for gastritis
    • H2 receptors and PPI enhance mucosal defenses and reduce pain
Gastritis

• Nursing management (cont)
  – Promote self care
  • Instruct to keep appointments with provider
  • Especially if H. pylori present, closely r/t gastric cancer

Peptic ulcer disease

• Break in the continuity of mucosa
  – Occurs in 10% of population

PUD

• Duodenal ulcers
  – Characterized by high gastric secretions
  – Rapid emptying of the stomach
• Gastric ulcers
  – Heal within few weeks
  – Form within an inch of the pylorus
  – Incompetent pylorus may decrease mucus production
    allowing gastric juices to injure mucosa
  – Incompetent pylorus may allow bile acids to reflux into
    the stomach and break the barrier

• Stress and drug induced ulcers
  – Usually occur after an medical crisis
  – Severe trauma or major illness
  – Severe burns
  – Head injury
  – Ingestion of drug
  – Shock
  – sepsis

• Causes and risk factors
  – 90% attributed to H. pylori
  – PUD results when the aggressive factors of
    PUD exceed the defensive barrier.
  – Smoking, chewing, alcohol, stress, steroids,
    ASA, NSAIDs,
  – Zollinger-Ellison, Crohn’s dz, hepatic and
    biliary disease may play a role also
**Pathophysiology of gastric ulcers**
- Protection factors: tight, nonpermeated junctions between epithelial cells and the alkaline layer of the mucus that coats the surface of the gastric epithelium
- This barrier may be interrupted by the chronic presence of the injurious substances such as ASA, NSAIDs, steroids

**Pathogenesis of duodenal ulcers**
- Activity of the vagus nerve is increased
- Stimulates the pyloric cells to release gastrin, which stimulates the release of HCl acid

**Another factor is emotional stress,**
- Thalamic stimulation of vagal nerves results in an increase in gastric secretion, blood supply, and gastric motility
- Stress reactions upset the aggressive-defensive balance.
PUD

• Zollinger–Ellison syndrome
  – Abnormal secretion of gastrin by rare islet cell tumor in the pancreas
  – Hypergastrinemia and diarrhea secondary to fat malabsorption
  – Hyperplasia of the gastric mucosa due to the trophic effects of gastrin
  – Treatment aimed at suppression of acid secretion

PUD

• Clinical manifestations
  – Acute pain
    • Aching, burning, cramp-like pain
    • Definite relation to eating
      – Gastric ulcers- food causes pain, vomiting relieves it
      – Duodenal ulcers- pain on empty stomach, relieved by food or antacids.
    • Location – 2-10 cm between the xiphoid and the umbilicus

PUD

• Clinical manifestations
  – Nausea and vomiting
    • Vomiting- gastric ulcer, esp. in the pylorus or antrum of stomach
    • Results from gastric stasis or pyloric obstruction
    • Usually vomits undigested food
PUD

• Clinical manifestations
  – Bleeding may be massive or occult

PUD

• Medical management
  – Provide stomach rest
  – Neutralize HCl acid
  – Eradicate H. pylori
  – Dietary management
  – Stress reduction

PUD

• Prevent and treat complications
  – Hemorrhage- assess bleeding, tarry stools.
  – Prevent shock with IV fluids, NPO, NG tube to assess bleeding and also to administer room temperature saline.
  – Replace fluids
  – Administer vasopressin- arterial admin.
  – Inject artery with emboli- via angiography
  – Maintain rest
PUD

- Maintain high gastric pH
- Stop bleeding surgically
- Perform multipolar electrocoagulation or heater probe therapy

PUD

- Perforation
  - Surgical emergency
  - Gastroduodenal contents escape through the stomach wall into the peritoneal cavity.
  - Assess pain - sudden sharp severe pain in the midepigastrium.
  - Replace fluids - immediate replacement of fluids, electrolytes, and blood as well as antibiotics
  - Correct perforation surgically

PUD

- Obstruction
  - Scarring causes pyloric obstruction
  - Pain at night
  - Vomiting
  - Surgery required
### PUD

#### Nursing management
- Monitor for development of complications
- Assess for pain and document occurrence and location
- Promote rest and relaxation
- Provide teaching
- Provide support

#### Surgical management
- See p. 756-758
- Different options

#### Nursing management of surgical patient
- Postop interventions
  - Maintain NG tube
  - Monitor for complication
  - Promote comfort
Gastric cancer

- Risk factors
- Men more than women
- Chronic atrophic gastritis
- Pernicious anemia
- Smoking
- Metal crafts workers, miners, bakers, dusty, smoky environments

Gastric cancer

- Arises from the mucosal lining
- Prognosis best for polypoid lesions
- Worse for ulcerating cancers
- Poorest for infiltrating forms

Gastric cancer

- Clinical manifestations
  - Seldom detected in early stages
  - Palpable mass, ascites or bone pain may be first manifestation
  - Weight loss, vague indigestion, anorexia,
Gastric cancer

- Nursing management
  - Control pain
  - Management of nutritional therapy
  - Explanation of disease and all treatment options

A and P review

- Large intestine
  - Cecum
  - Ascending
  - Transverse
  - Descending

Assessment of elimination

- Similar assessment questions as with the upper digestive systems
- Travel history of client is particularly important in assessing for elimination disorders
- E. coli is most common cause of diarrhea
Physical examination

- Abdomen
- Anus
- Rectum

Anus and rectum

- Most nurses do a visual inspection
- Rectal anatomy is important in assessing for digital impaction

Diagnostic tests

- Similar to ingestive diagnostic tests
- Laboratory tests
  - CEA- High CEA levels characteristic of malignancies of breast, colorectal cancer
    - Often called tumor markers when used to monitor effectiveness of treatment
Diagnostic tests

• Fecal analysis
  – Color, consistency, odor,
  – Stool specimen required for diagnosis of infectious diseases, GI bleeding and other GI disorders
  – Fecal occult blood
    • Screening for colorectal cancer

Diagnostic tests

• Stool examination for ova and parasites
• Stool cultures
• Fecal lipids

Diagnostic tests

• Endoscopy
  – Protosigmoidoscopy
    • Lining of the sigmoid colon, the rectum and the anal canal using a proctoscope and a sigmoidoscope.
  – Colonoscopy
    • Visual exam of the entire lining of the colon with a flexible fiberoptic scope. Screen clients at high risk of colon cancer.
Management of clients with intestinal disorders

- Bleeding – blood in stool, color is affected by the digestive processes on the blood and the rapidity with which the chyme passes thru the bowel.
- Pain - acute or chronic, caused by mechanical, inflammatory or ischemic changes.

Intestinal disorders

- Nausea and vomiting
  - Distention of the duodenum
  - Changes in the integrity of intestinal wall
  - Changes in the motility
  - Vomitus that contains fecal matter usually indicates a distal obstruction in S.I.

Intestinal disorders

- Distention
  - Caused by excessive gas in the intestines
  - Flatus is another clinical manifestation
Intestinal disorders

• Diarrhea
  – Increase in frequency, volume, and fluid content of stool
  – Common causes: infections, malabsorption syndromes, medications, allergies, and systemic diseases

Intestinal disorders

• Constipation
  – Infrequent or difficult passage of stool
  – Passage of hard stool

• Abnormalities of fecal content
  – Presence of fats or other abnormal constituents normally absorbed from the stool

Inflammatory disorders

• Viral and bacterial infections
  – Gastroenteritis
    • Inflammation of stomach and intestinal tract
    • Diarrhea, abd. pain, and cramping
    • Contaminated food and water
    • C. difficile bacterial dysentery
Inflammatory disorders

• Pathophysiology
  – Disruption of intestinal flora by
    • Harmful bacteria and viruses that cause tissue damage and inflammation
    • Depressed by antibiotic therapy, administered either orally or parenterally.

Inflammatory disorders

• Parasitic infections
  – Protozoa
    • Replicate in the intestinal tract of the host and excreted in the feces.
    • Water borne disease usually but more food borne recently
    • Giardiasis- spoiled food or fecal contaminated surfaces or contaminated recreational water

Inflammatory disorders

• Parasitic infections
  – Helminths- parasitic worms
    • Contracted through the skin or from ingesting contaminated food or water
  – Schistosomiasis- parasitic flatworm-
Inflammatory disorders

• Nursing management
  – Rest the bowel
  – Decrease diarrhea
  – Restore fluid and electrolytes
  – Assess diarrhea stools
  – Assess bowel sounds
  – Prevent spread of disease

• Appendicitis
  – Caused by fecalith that occludes the lumen of the appendix
  – Kinking of the appendix
  – Swelling of the bowel wall
  – Fibrous conditions of the bowel wall

• Manifestations
  – Acute abdominal pain that comes in waves
  – Guarding
  – Drawing up the legs to relieve tension
  – Vomiting
  – Low grade fever
Inflammatory disorders

- Peritonitis
- Inflammation of the peritoneal membrane
  - Peritoneal membrane is a semipermeable two-layered sac filled with 1500 ml of fluid
  - Primary or secondary peritonitis

Inflammatory disorders

- Clinical manifestations
  - Pain may be localized or generalized
  - Pain that causes rigidity of the abdomen
  - Nausea and vomiting
  - Absence of bowel sounds
  - Shallow respirations

Inflammatory disorders

- Inflammatory bowel disease
  - Crohn’s disease
  - Ulcerative colitis
Inflammatory disorders

• Clinical manifestations
  – Both similar
  – Abdominal pain, diarrhea, fluid imbalances, weight loss
  – Can be very thin, wasted appearance, abdomen is flat or concave with visible peristalsis
  – Tenderness on palpation
  – Rectal bleeding with ulcerative colitis

Inflammatory disease

• Medical interventions are aimed at controlling symptoms such as diarrhea and pain
• TPN is required if client does not respond to medical intervention

Inflammatory disorders

• Surgical management
  – Ulcerative colitis- undergo colectomy with permanent ileostomy
  – Crohn’s disease- surgery due to complications
Inflammatory disorders

• Ostomies
  – Pouch should fit close around stoma
  – Assess skin for irritation each change
  – Reduce odor
  – Discuss medications
  – Emphasize fluid intake
  – Explain dietary recommendations
  – Prevent kidney stones

Neoplastic disorders

• Benign tumors of the bowel
  – Polyps
    • Can become cancerous and can cause obstruction

• Cancer of the small bowel
  – Surgery is only option for cure

• Colorectal cancer
  – Most common GI cancer
  – Incidence declining with increased screening
  – Most tumors found in distal portion
Neoplastic disorders

- Colorectal cancers
  - Risk factors
    - High fat diets, few fruits and vegetables
    - Hereditary links
    - Increased age
    - History of breast, ovarian, endometrial cancers and ulcerative colitis

Neoplastic disorders

- Colorectal cancer
  - 95% develop from polyps
  - Spread by direct invasion of surrounding tissue
  - Lymphatic and circulatory channels
  - Seeding of cells into the peritoneal cavity

Neoplastic disorders

- Manifestations
  - Rectal bleeding, change in bowel habits,
  - Abdominal pain, weight loss, anemia and anorexia
  - Tumors in large intestine rarely have early signs
  - 1/3 of tumors in distal colon and rectum can be palpated with digital rectal exam
Neoplastic disorders

• Prognosis
  – Depends on health of client
  – How early the disease is diagnosed
  – How effective the treatment is
  – Overall 51% survive 10 years

• Medical management
  – Decrease tumor growth
  – Radiation therapy
  – Chemotherapy

• Colostomies
  – Single barrel-permanent
  – Double barrel- temporary
  – Loop –temporary
  – Abdominal-perineal resection
**Neoplastic disorders**

- Nursing management
  - Assess for peristalsis
  - Advance diet as tolerated
  - Reduce pain
  - Monitor stoma drainage
  - Prevent thrombophlebitis
  - Emotional support r/t disturbed body image

**Neoplastic disorders**

- Nursing management
  - Colostomies
    - Teach ostomy care, encourage self-care
    - Teach stoma irrigation

**Herniations**

- Abnormal protrusion of bowel through a weakness of abdominal musculature
  - Reducible
  - Irreducible
  - Incarcerated
  - Strangulated
Diverticular disease

- Diverticulum: out pouching or herniation of intestinal mucosa through the muscular coat of the large intestine
- Diverticulosis: presence of non inflamed diverticulum
- Diverticulitis: inflammation of diverticulum

Meckel’s diverticulum

- Out pouching of the bowel, is a vestige of embryonic development found on the cecum near the ileum
- May have gastric mucosa or pancreatic tissue
- May ulcerate and bleed or perforate

Intestinal obstruction

- Partial or complete impairment of the forward flow of intestinal contents
- Mostly in small bowel, especially ileum
- Nausea, vomiting, dehydration, pain
- High mortality if not treated in 24 hours
Intestinal obstruction

• Mechanical factors
  – Hernia
  – Volvulus
  – Intussusception
  – Cancers

• Neurogenic factors
  – Paralytic ileus
    • Occurs after abdominal surgery
    • Trauma
    • Hypokalemia
    • Vascular insufficiency

• Vascular factors
  – Occlusion of mesenteric artery
    • Mesenteric infarction
  – Partial occlusion
    • Abdominal angina
Intestinal obstruction

• Manifestations
  – Vomiting
  – Loss of fluid and electrolytes
  – Abdominal pain in waves
  – Distention
  – High pitched bowel sounds- tinkling sound

Intestinal obstruction

• Management
  – Decompress the bowel
    • Bowel rest
    • Intestinal tube to relieve pressure
    • Maintain fluid balance
    • Note the amount and color of fluid from tube

Irritable bowel syndrome

• Functional disorder of motility
• There is no organic disease or abnormality
• Diets high in fat, lactose, caffeine and alcohol
• High stress
IBS
• Health promotion strategies
  – High fiber diet, low-fat, avoid problem food
  – Reduce stress, avoid smoking and alcohol
  – Regular exercise and sleep

Celiac disease
• Causes severe malabsorption
• marked atrophy in the villi in the small intestine
• Induced by ingestion of gluten-containing foods
• Gluten is found in rye, oats, barley and wheat.

Anorectal area disorders
• Hemorrhoids- perianal varicose veins
  – Enlarged mass at the anus
  – Bleeding
  – Itching and pain at rectal area
Anorectal area disorders

- Anal fissure - ulceration or tear of the lining of the anal canal
- Anal fistula - a sinus tract that develops between the anal canal to the skin outside the anus or from an abscess to either the anal canal or the perianal area.

Neural regulation

- Sympathetics inhibit activity in enteric plexuses, constrict GI system blood vessels, and decrease glandular secretions
- Parasympathetics (vagus) innervate all structures from the salivary glands to the transverse colon. Stimulate motor activity, secretory activity, and endocrine secretions.