Exam 2: Review

Assessment of Digestive and Gastrointestinal Tract:

**Health History:** Begins with a *complete history*. Info about abdominal pain, dyspepsia, gas, nausea and vomiting, diarrhea, constipation, fecal incontinence, jaundice, and previous GI disease is obtained.

**Common Symptoms:**

*Pain:* The character, duration, pattern, frequency, location, distribution of referred pain, and time of the pain vary greatly depending on the underlying cause.

*Dyspepsia:* Upper abdominal discomfort associated with eating (commonly called indigestion), is the *most common symptom of patients with GI dysfunction.* Pain, discomfort, fullness, bloating, early satiety, belching, heartburn, or regurgitation. It occurs in approximately 25% of the adult population. *Fatty Foods* cause the *most* discomfort because they remain in the stomach for digestion longer than proteins or carbohydrates. *Salads, coarse vegetables, and highly seasoned foods can cause considerable GI distress.*

*Intestinal Gas:* Usually gases in the small intestine pass into the colon and are released as flatus. Patients often complain of bloating, distention, or feeling “full of gas” with *excessive flatulence as a symptom of food intolerance or gallbladder disease.*

*Nausea and Vomiting:* Nausea can be triggered by odors, activity, medications, or food intake. The “*emesis*” or *vomitus*, may *vary in color and content* and may contain undigested food particles, blood, or bilious material mixed with gastric juices. Causes can be from visceral afferent stimulation, CNS disorders, irritation of the chemoreceptor trigger zone from radiation therapy.

**Changes in Bowel Habits and Stool Characteristics**

*Changes in bowel habits may signal colonic dysfunction or disease.* **Diarrhea,** an abnormal increase in the frequency and liquidity of the stool or in daily stool weight or volume, commonly occurs when the *contents move so rapidly through the intestine and colon that there is inadequate time for the GI secretions and oral contents to be absorbed.*

Physiologic function is typically associated with abdominal pain or cramping and nausea and vomiting.

Constipation, a decrease in the frequency of stool, or stools that are hard, dry, and smaller volume than typical, may be associated with anal discomfort and rectal bleeding. Stool is normally *light to dark brown*; however, specific disease processes and ingestion of certain foods and medications may change the appearance of stool.

Upper GI Bleed= *black-tarry stools (melena)*

Lower GI Bleed= *Bright red or dark red.*

*Ask about past health, family, and social history to piece together health history.* History of tobacco use, alcohol use, weight gain, weight loss, sore throats, etc.

**Physical Assessment:** The physical examination includes assessment of the mouth, abdomen, and rectum and requires a good source of light, full exposure of the abdomen, warm hands with short fingernails, and a comfortable and relaxed patient with an empty bladder.

*Oral Cavity Inspection and Palpation:*

-Dentures should be *removed* to allow good visualization of the entire oral cavity.
Lips: The examination begins with inspection of the lips for moisture, hydration, color, texture, symmetry, and the pretense of ulcerations or fissures. Patient is instructed to open mouth wide, and a tongue blade is then inserted to expose the buccal mucosa for an assessment of color and lesions. Stensen’s duct of each parotid gland is visible as a small red dot in the buccal mucosa next to the upper molars.

Gums: The gums are inspected for inflammation, bleeding, retraction, and discoloration. The odor of breath is also noted. The hard palate is examined for color and shape.

Tongue: The dorsum (back) of tongue is inspected for texture, color, and lesions. Thin white coat and large, vallate papillae in a “V” formation on the distal portion of the dorsum of tongue are normal findings.

Abdominal Inspection, Auscultation, Percussion, and Palpation
- The patient lies supine with knees flexed slightly for inspection, auscultation, percussion, and palpation of the abdomen. The abdomen is divided into 4 quadrants for purposes of examination. Auscultate for a full minute of each of the quadrants. Always auscultate first to hear for presence of bruits or problems. Auscultate the abdominal aorta artery for bruits. Then percuss all 4 quadrants listen for blocks. Palpate all 4 quadrants, observe patients face for pain or discomfort, feel for hernias, lumps, or anything abnormal.

Rectal Inspection and Palpation
The anal canal is approximately 1-1.6 inches in length and opens into the perineum.

Diagnostic Testing
- GI diagnostic studies can confirm, rule out, stage, or diagnose various disease states. Majority of these tests are performed at an outpatient center.
General Nursing Interventions for Patients undergoing a GI diagnostic evaluation:
- Establishing the Nursing diagnosis
- Providing need info about the test and the activities required of the patient
- Providing instructions about post-procedure care and activity restrictions
- Providing health info and procedural education to patients and significant others
- Helping the patient cope with discomfort and alleviating anxiety.
- Informing the primary provider of known medical conditions or abnormal laboratory value that may affect the procedure.
- Assessing for adequate hydration before, during, and immediately after the procedure, and providing education about maintenance of hydration.

Serum Laboratory Studies
Initial diagnostic tests begin with serum lab studies, including but not limited to CBC, complete metabolic panel, prothrombin time/partial thromboplastin time, triglycerides, liver function tests, amylase, and lipase, etc.

Stool Tests
Basic examination of the stool includes inspecting the specimen for consistency, color, and occult (not visible) blood.
Additional studies, for example for Clostridium Difficile, include further laboratory evaluation.
- Stool samples are usually random
- Random samples should be sent to the lab promptly.
- 24-72 hr collections must be kept refrigerated until transported to the lab.
Fecal Occult Blood Testing (FOBT) is one of the most commonly performed stool tests. It can be useful in initial screening for several disorders, although it is used most frequently in early cancer detection programs.
  - FOBT can be performed at the bedside, in the lab, or at home.
  - It is inexpensive, noninvasive, and carries minimal risk to patients.
  - Should NOT be performed when there is hemorrhoidal bleeding.
  - Red meats, aspirin, NSAIDS, turnips, and horseradish should be avoided for 72 hrs prior, because they may cause a false positive result. (Vitamin C ingestion can cause a false negative)
  - A small amount of specimen is applied to the guaic-impregnated paper slide.

Breath Tests:
- The hydrogen breath test was developed to evaluate carbohydrate absorption, in addition to aiding in the diagnosis of bacterial overgrowth in the intestine and short bowel syndrome. This test determines the amount of hydrogen expelled in the breath after it has been produced in the colon and absorbed into the blood.
- Urea breath tests detect the presence of helicobacter pylori, the bacteria lining that can live in the mucosal lining of the stomach and cause peptic ulcer disease.
  - The patient ingests a capsule of carbon-labeled urea, a breath sample is obtained 10-20 mins after.

Oral Cancer and Radical Neck Dissection
- Cancers of the oral cavity and pharynx, which can occur on any part of the mouth or throat, are curable if discovered early.
  Risk Factors for Cancer of oral cavity:
  - cigarette
  - cigar
  - pipe smoking
  - use of smokeless tobacco
  - excessive use of alcohol
  - infection with HPV
Oral cancer from men WITHOUT HPV are greatest in men over 50.
Almost TWICE AS HIGH in men than women.
MORE common with AFRICAN AMERICANS than caucasians.
HPV associated cancers of the oropharynx behave differently than those that are not associated with HPV.
-Survival rates with patients who have HPV are quite good, but prognosis is worse if they have a history of tobacco abuse.

Pathophysiology
-malignant growths, but the lips, the lateral aspects of the tongue, and the floor of the mouth are commonly most affected.

Clinical Manifestations
-Many oral cancers produce few or no symptoms in the early stages. Later, the most frequent symptom is a painless mass that does not heal. It may bleed easy and may produce a red or white patch that persists.
-Patient may complain of tenderness, difficulty in chewing, swallowing, or speaking; coughing of blood-tinged sputum; or enlarged cervical lymph nodes.

Neck Dissection
-includes removal of all cervical lymph nodes from the mandible to the clavicle and removal of the sternocleidomastoid muscle, internal jugular vein, and spinal accessory muscle on one side of the neck.
-Selective Dissection preserves one or more of the lymph node groups, muscles, or internal jugular vein.
-Reconstructive techniques may be performed with a variety of grafts.

Gastritis
-Inflammation of the gastric or stomach mucosa.
-Common GI problem
-May be acute, lasting several hours to a few days
-or chronic, resulting from repeated exposure to irritating agents or recurring episodes of acute gastritis.
-Nonerosive gastritis most often caused by infection with helicobacter pylori.

Signs and Symptoms
-Abdominal discomfort, headache, nausea, anorexia, vomiting, and hiccupsing, which can last from a few hours to a few days.
-Erosive gastritis may cause bleeding, which may manifest as blood in vomit or as black tarry stools, or bright red, bloody stools.
-Chronic gastritis- may complain of anorexia, heartburn after eating, belching, sour taste in mouth, or nausea and vomiting.

Assessment
-Gastritis is sometimes associated with achlorhydria (lack of hydrochloric acid), hypochlorhydria (low levels of HCL), or hyperchlorhydria (high levels of HCL).
- Diagnosis is determined by an endoscopy and histologic examination of a tissue specimen obtained by biopsy.
-Diagnostic measures for detecting H. Pylori infection may be used and are discussed later in this chapter in the peptic ulcer disease section.

Medical Management:
-Gastric mucosa is capable of repairing itself after an episode of acute gastritis.
-The patient recovers in about 1 day
-Appetite may be diminished for 2-3 days
-Patient must also refrain from alcohol and food until symptoms subside.
-IV fluids for nutrition
-If bleeding is present, same management as an upper GI bleed
Therapy is supportive and may include **NG tubes, antacids, histamine 2 receptors, PPI's**

- **In some cases emergency surgery is required to remove gangrenous or perforated tissues.**
- **Gastrojejunostomy** may be necessary to **treat gastric outlet obstruction**, also called **pyloric obstruction.**

**Nursing Management**
- Reduce Anxiety
- Promoting optimal nutrition
- Promoting fluid balance
- Relieving pain

**Peptic Ulcer Disease**
- an excavation (hollowed out area) that forms in the mucosal wall of the stomach and duodenum.
- This erosion may extend as deeply as the muscle layers or through the muscle to the peritoneum.
- More likely to occur in the duodenum than in the stomach
- As a rule they may occur alone, but may occur in multiples
- Mostly occur from H.Pylori bacteria

**Clinical Manifestations**
- Patient complains of gnawing pain or a burning situation in the midpigastrium or the back.
- Pain occurring 2-3 hours after eating.
- May include pyrosis (heartburn), vomiting, constipation, or diarrhea, and bleeding.
- Vomiting may be a symptom of a complication of an ulcer, resulting from gastric outlet obstruction, caused by either muscular spasm of the pylorus or mechanical obstruction from scarring or acute swelling of the inflamed mucous membranes.

**Assessment and diagnostic Findings**
- Physical examination may reveal pain, epigastric tenderness, or abdominal distention.
- Upper endoscopy is the preferred diagnostic procedure because it allows direct visualization of inflammatory changes, ulcers, and lesions.
- Biopsy of the gastric mucosa and any suspicious lesions can be obtained.
- The patient who has a bleeding peptic ulcer may require periodic complete blood counts to determine the extent of blood loss and whether or not blood transfusions are advisable.
- Stools may be tested periodically until they are negative for occult blood.

**Medical Management**
- Peptic ulcers treated with antibiotics to eradicate H.Pylori have a lower recurrence rate than those not treated with antibiotics. The goals are to eradicate H. Pylori as indicated and to manage gastric acidity.

**Pharmacologic Therapy**
- The most commonly used therapy for peptic ulcers are combos of antibiotics, PPI's, and bismuth salts that suppress or eradicate H.Pylori.
- Recommended therapy for 10-14 days includes triple therapy with two antibiotics or amoxicillin, and clarithromycin plus a proton pump inhibitor.
- H2 blockers and proton pump inhibitors that reduce gastric acid secretion are used to treat ulcers not associated with H.Pylori infection.
- Patient is advised to adhere to and complete the medication regimen to ensure complete healing of the ulcer.
- Patient advised to avoid the use of NSAIDs, because most patients become symptom free within a week, the nurse stresses to the patient the importance of following the prescribed regimen so that the healing process can continue uninterrupted and the return of chronic ulcer symptoms can be prevented.

- Smoking cessation: decreases the secretion of bicarbonate from the pancreas into the duodenum.
- Dietary modification
- Surgical management
**Inflammatory Intestinal Disease: Diverticular Disease**

A **Diverticulum** is a saclike herniation of the lining of the bowel that extends through a defect in the muscle layer. Diverticula may occur anywhere in the small intestine or colon but most commonly occur in the sigmoid colon.

- Asian patients tend to develop diverticula in the right colon, due to genetic differences.

**Diverticulosis** is when multiple diverticula are present without inflammation or symptoms.

- A low intake of dietary fiber is considered a predisposing factor, but the exact cause has not been identified.

**Diverticulitis** results when food and bacteria retained in a diverticulum produce infection and inflammation that can impede drainage and lead to perforation or abscess formation.

- Symptoms result from complications: abscess, fistula formation, obstruction, perforation, peritonitis, and hemorrhage.

**Clinical Manifestations**

- Chronic constipation often precedes the development of diverticulosis by many years.

- Frequently, no problematic symptoms occur, and symptoms are mild and include bowel irregularity with intervals of diarrhea, nausea, and anorexia, and bloating or abdominal distention.

- With repeated local inflammation of the diverticula, the large bowel may narrow with fibrotic structures, leading to cramps, narrow stools, and increased constipation or at times intestinal obstruction.

- Weakness, fatigue, and anorexia are common symptoms.

- With diverticulitis, the patient reports an acute onset of mild to severe pain in the left lower quadrant, accompanied by nausea, vomiting, fever, chills, and leukocytes.

**Assessment and Diagnostic Findings**

- Typically diagnosed by colonoscopy

- In the past Barium enema was the preferred diagnostic test, but it is now used less frequently.

- If there are symptoms of peritoneal irritation when the diagnosis is diverticulitis, barium enema is contraindicated because of the potential for perforation.

- CT scan with contrast agent is the diagnostic test of choice if the suspected diagnosis is diverticulitis, it can also reveal abscesses.

- Abdominal x-rays may demonstrate free air under the diaphragm if a perforation has occurred from the diverticulitis.

- Colonoscopy is contraindicated in acute diverticulitis because the risk of perforation in the presence of local infection may result in sepsis.

**Gerontologic Considerations**

- Incidence of diverticular disease increases with age because of degeneration and structural changes in the circular muscle layers of the colon and because of cellular hypertrophy.

**Medical Management**

Diverticulitis can usually be treated on an outpatient basis with diet and medication.

- When symptoms occur, rest, analgesic meds, and antispasmodic agents are recommended.

- Initially a clear liquid diet is consumed until inflammation subsides.

- This diet helps increase stool volume, decrease colonic transit time, and reduce intraluminal pressure.

- Antibiotics are prescribed for 7-10 days, a bulk forming laxative is also prescribed.
In acute cases of diverticulitis, with significant symptoms, hospitalization is required.
- Usually for older, immunocompromised, patients or if taking corticosteroids.

- Withholding oral intake, administering IV fluids, and instituting nasogastric suctioning if vomiting or distention occurs are used to rest the bowel.
  - Broad spectrum antibiotics are prescribed for 7-10 days.
  - An opioid or other analgesic agents may be prescribed for pain relief.
- If surgery is necessary pain management will include parenteral opioids such as hydromorphone, morphine, or fentanyl with progression to oral analgesic agents. Oral intake is increased as symptoms subside.
  - A low fiber diet may be necessary until signs of infection decrease.
- Antispasmodic agents such as propantheline bromide and oxyphencyclimine may be prescribed.

- Often it is not possible for patients to consume the 20-30g of daily fiber that is recommended.
- Normal stools can be achieved by supplementing dietary fiber with bulk preparations or stool softeners, by instilling warm oil into the rectum, or by inserting an evacuant suppository.

**Nursing Diagnoses**
- Constipation related to narrowing of the colon from thickened muscular segments and structures.
- Acute pain related to inflammation and infection

**Collaborative problems**
Potential complication may include the following
- Peritonitis
- Abscess formation
- Bleeding

**Crohn's Disease**
- Usually first diagnosed in adolescent or young adults but can appear at any time of life. The incidence of Crohn's Disease has risen over the past 30 years.
- Crohn's disease is seen more often in smokers than in non-smokers.

- Crohn's disase is a subacute and chronic inflammation of the GI tract wall that extends through all layers. Although its characteristics histopathologic changes can occur anywhere in the GI tract, it is most commonly occurs in the distal ileum and, to a lesser degree, the ascending colon.

- The onset of symptoms is usually insidious in Crohn's disease, with prominent right lower quadrant abdominal pain and diarrhea unrelied by defecation.
- Scar tissue and the formation of granulomas interfere with the ability of the intestine to transport products of upper intestinal digestion through the constricted lumen, resulting in cramps abdominal pains.
- Fever and leukocytosis occur.
- Chronic symptoms include diarrhea, abdominal pain, steatorrhea (excessive fat in the feces), anorexia, weight loss, and nutritional deficiencies.

**Assessment and Diagnostic Findings**
A proctosigmoidoscopy is usually performed initially to determine whether the rectosigmoid area is inflamed. A stool examination is also performed, the result may be positive for occult blood and steatorrhea.

- The most conclusive diagnostic aid for Crohn's disease has classically been a barium study of the upper GI tract that shows a "string sign" on an X-ray film of the terminal ileum, indicating the constriction of a segment of intestine.
- Endoscopy, colonoscopy, and intestinal biopsies may be used to confirm the diagnoses.
- A barium enema may show ulcerations, fissures, and fistulas. A CT scan may show bowel wall thickening and fistula formation.
Colorectal Cancer

**Assessment**
- The nurse obtains a health history about the presence of fatigue, abdominal or rectal pain, past and present elimination patterns, characteristics of stool, color, odor, consistency, presence of blood or mucus.

**Diagnosis**
- Imbalanced nutrition: less than body requirements related to nausea and anorexia
- Risk for deficient fluid volume related to vomiting and dehydration
- Anxiety related to impending surgery and the diagnosis of cancer
- Risk for ineffective self-health management related to knowledge deficit concerning the diagnosis, the surgical procedure, and self care after discharge.
- Impaired skin integrity related to the surgical incisions, the formation of a stoma, and frequent fecal contamination of peristomal skin.
- Disturbed body image related to colostomy
- Ineffective sexuality patterns related to presence of ostomy and changes in body image and self concept.

**Collaborative Problems**
- Intraperitoneal infection
- Complete large bowel obstruction
- GI bleeding
- Bowel perforation
- Peritonitis, abscess, and sepsis

**Colostomy Care**
- The colostomy begins to function 3-6 days after surgery. The nurse manages the colostomy and educates the patient about its care until the patient can take over its management.

Ulcerative Colitis

- A recurrent ulcerative and inflammatory disease of the mucosal and submucosal layers of the colon and rectum.
  - Highest in caucasian and people of Jewish descent.

**Assessment**
- Nurse obtains health history to identify the onset, duration, and characteristics of abdominal pain; the presence of diarrhea or fecal urgency, straining at stool, nausea, anorexia, or weight loss, and family history of IBD.
- It is important to discuss dietary patterns, including amounts of alcohol, caffeine, and nicotine-containing products used daily and weekly. The nurse asks about patterns of bowel elimination, including character, frequency, and presence of blood, pus, fat, mucus. Allergy and food intolerance, especially milk intolerance, must be noted. The patient may identify sleep disturbances if diarrhea or pain occurs at night.

**Diagnosis**
- Diarrhea related to inflammatory process
- Acute pain related to increased peristalsis and GI inflammation
- Deficient fluid volume related to anorexia, nausea, and diarrhea
- Imbalanced nutrition: Less than body requirements related to dietary restrictions, nausea, and malabsorption.
- Activity intolerance related to generalized weakness
- Anxiety related to impending surgery
- Ineffective coping related to repeated episodes of diarrhea.
- Risk for impaired skin integrity related to malnutrition and diarrhea
- Risk for ineffective self-health management related to insufficient self health management related to insufficient knowledge concerning the process and management.

Collaborative Problems
- Electrolyte imbalance
- Cardiac dysrhythmias related to electrolyte imbalances
- GI bleeding with fluid volume loss
- Perforation of the bowel

Pharmacologic Therapy
- Sedatives and antidiarrheal and antiperistalsic meds are used to minimize peristalsis in order to rest the inflamed bowel. They are continued until the patients stools approach normal frequency and consistency.
- Aminosalicylates such as azulfidine are often effective for mild or moderate inflammation and are used to prevent or reduce recurrences in long term maintenance regimens.
- Sulfur free aminosalicylates are effective in preventing and treating recurrence of inflammation.
- Antibiotics are used for secondary infections.
- Corticosteroids are used to treat severe and fulminant disease and can be administered orally in outpatient treatment parenterally in hospitalized patients.
- Immunodilators have been used to alter the immune response.

Assessment of Urinary System
- A history of pertinent signs and symptoms is obtained from the patient with a suspected UTI. The presence of pain, frequency, urgency, hesitancy, and changes in urine are assessed, documented, and reported.
- The patients usual pattern of voiding is assessed to detect factors that may predispose him or her to a UTI.
- Infrequent emptying of the bladder, the association of symptoms of UTI with sexual intercourse, contraceptive practices, and personal hygiene are assessed. The patients knowledge about prescribed antimicrobial meds and preventive health care measures is also assessed. Additionally, the urine is assessed for volume, color, concentration, cloudiness, and odor—all of which are altered by bacteria the urinary tract.

Nursing Process for Patients Undergoing Diagnostic Studies
- A comprehensive health history is used to determine the appropriate laboratory and diagnostic tests.
- The nurse should educate the patient about the purpose, what to expect, and any possible side effects related to these examinations prior to testing.
- The nurse should also note trends in results, because they provide info about disease progression as well as the patients response to therapy

Urinalysis and Urine Culture: Determines whether bacteria is present in the urine as well as their strains and concentration.

Fluid and Electrolyte Balance
- Patients with kidney disorders commonly experience fluid and electrolyte imbalances and require careful assessment and close monitoring for signs and potential problems.

**The most common indicator of fluid loss or gain in an acutely ill patient is weight.**

1 kg weight gain is equal to 1000 ml of retained fluid.

Clinical Manifestations:
- Acute weight loss
- Acute weight gain
- Dry, sticky mucous membranes, thirst, rough dry tongue, fever, restlessness

Gerontologic Considerations
- With aging, the kidney is less able to respond to acute fluid and electrolyte changes.

**Acute Nephritic Syndrome:**
- Type of renal failure with glomerular inflammation.
- Glomerulonephritis is an inflammation of the glomerular capillaries that can occur in acute and chronic form.

**Clinical Manifestations**
- Hematuria, edema, azotemia (an abnormal concentration of nitrogenous wastes in the blood) and proteinuria (excess protein in the urine)

**Assessment and Diagnostic Findings**
- The kidneys become large, edematous, and congested. All renal tissues, including the glomeruli, tubules, and blood vessels, are affected to varying degrees.
- Patients with immunoglobulin A (IgA) nephropathy have an elevated serum IgA and low to normal complement levels.
- If the patient improves, the amount of urine increases and the urinary protein and adamant diminish.
- The percentage of adults who recover is unknown.
- Some patients develop severe uremia (an excess of urea and other nitrogenous waste in the blood) within weeks and require dialysis for survival.

**Medical Management**
- Consists primarily of treating symptoms, attempting to preserve kidney function, and treating complications promptly.
- Treatment may include prescribing corticosteroids, managing hypertension, and controlling proteinuria.
- Pharmacologic Therapy depends on the cause of glomerulonephritis.
- If residual streptococcal infection is suspected, penicillin is the agent of choice, however, other antibiotic agents may be prescribed.
- Dietary protein is restricted when renal insufficient and nitrogen retention (elevated BUN) develop.
- Sodium is restricted when the patient has hypertension, edema, and heart failure.

**Chronic Glomerulonephritis**
- May be due to repeated episodes of acute nephrotic syndrome, hypertensive nephrosclerosis, hyperlipidemia, chronic rubulointerstitial injury, or hemodynamically mediated glomerular sclerosis.
- Secondary glomerular diseases that can have systemic effects include systemic lupus erythematosus, good pasture syndrome (caused by antibodies to the glomerular basement membrane), diabetic glomerulosclerosis, and amyloidosis.

**Pathophysiology**
- Kidneys are reduced to as little as one fifth their normal size. The cortex layer shrinks to 1-2mm in thickness or less.

**Clinical Manifestations**
- Some patients with severe disease have no symptoms at all for many years.
- The condition may be discovered when hypertension or elevated BUN and serum creatinine levels are detected.
- Most patients report general symptoms such as loss of weight, strength, increasing irritability, and an increased need to urinate at night (nocturia).
- Headaches, dizziness, and digestive disturbances are also common.
- As chronic glomerulonephritis progresses, signs and symptoms of CKD may develop.
- The patient appears poorly nourished, with a yellow-gray pigmentation of the skin and periorbital and peripheral (dependent) edema.
- Blood pressure may be normal or severely elevated.
- Retinal findings include, hemorrhage, exudate, narrowed tortuous arterioles, and papilledema.
- Anemia causes distended neck veins, and other signs and symptoms of heart failure may be present. Crackles can be heard in the bases of the lungs. Peripheral neuropathy with diminished deep tendon reflexes and neurosensory changes occur late in the diseases.

Assessment and Diagnostic Findings
- Urinary casts (proteins secreted by damaged kidney tubules).
- As renal failure progresses and the GFR falls below 50mL/min the following changes occur:
  - Hyperkalemia
  - Metabolic acidosis from decreased acid secretion by the kidney
  - Anemia secondary to decreased erythropoiesis
  - Hypoalbuminemia with edema secondary to protein loss through the damaged glomerular membrane.
  - Increased serum phosphorus level due to decreased renal excretion of phosphorus
  - Decreased serum calcium levels
  - Mental status changes
  - Impaired nerve conduction

Med Management
- If patient has hypertension, efforts are made to reduce the blood pressure with sodium and water restriction, antihypertensive agents or both.
- Weight is monitored daily and diuretic medications are prescribed to treat fluid overload.
- Dialysis is initiated early in the course of the disease to keep the patient in optimal physical condition.

Nephrotic Syndrome
- Type of renal failure characterized by increased glomerular permeability and is manifested by massive proteinuria. Clinical findings include a marked increase in protein, a decrease in albumin in the blood, diffuse edema, high serum cholesterol, and low density lipoproteins.

Clinical Manifestations
- The major manifestation of nephrotic syndrome is edema.
- It is usually soft, and pitting and commonly occurs around the eyes, in dependent areas (sacrum, ankles, and hands) and in the abdomen (ascites).
- Patients may also exhibit irritability, headache, and malaise.

Assessment and Diagnostic Findings
- Proteinuria exceeding 3.5 g/day is the hallmark of the diagnosis of nephrotic syndrome.
- The urine may also contain increased white blood cells (WBCs) as well as granular and epithelial casts.

Med Management
- Focused on addressing the underlying disease state causing proteinuria, slowing progression of CKD, and relieving symptoms.
- Typical treatment includes diuretic agents for edema, ACE inhibitors to reduce proteinuria, and lipid lowering agents for hyperlipidemia.

Urinary Tract Calculi

Assessment
- Assessed for pain, discomfort as well as associated symptoms, such as nausea, vomiting, diarrhea, and abdominal distention. The severity and location of pain are determined, along with any radiation of the pain.
- Observing for signs and symptoms of UTI (chills, fever, frequency, and hesitancy.) and obstruction.
- The urine is inspected for blood and is strained for stones or gravel.
Diagnoses
-Acute pain related to inflammation, obstruction, and abrasion of the urinary tract.
-Deficient knowledge regarding prevention of recurrence of renal stones.

Collaborative Problems
-Infection and urosepsis (From UTI and pyelonephritis)
-Obstruction of the urinary tract by a stone or edema with subsequent acute renal failure

Goals
-Major goals for the patient include relief of pain and discomfort, prevention of recurrence of renal stones, and absence of complications

Care of the patient with a Urinary Diversion
-Urinary Diversion procedures are performed to divert urine from the bladder to a new exit site, usually through a surgically created opening (stoma) in the skin.

-Ileal Conduit: is the oldest and most common of the urinary diversion procedures in use because of the low number of complications and surgeons familiarity with the procedure.
-The urine is diverted by implanting the ureter into a 12cm loop of ileum that is left out through the abdominal wall.
-Providing Stoma and Skin care
-Testing urine and caring for the osmotic
-Encouraging fluids and relieving anxiety
-Selecting the osmotic appliance
-Promoting home and community based care

Care of Patient with Acute Kidney Injury
-The nurse monitors for complications, participates in emergency treatment of fluid and electrolyte imbalances, assesses the patients progress and response to treatment.

Monitoring Fluid and Electrolyte Balance
-Nurse monitors patients serum electrolyte levels and physical indicators of these complications during all phases of the disorder.
-IV solutions must be carefully selected based on the patients fluid and electrolyte status.
-Patients cardiac and musculoskeletal status are monitored closely for signs of hyperkalemia.

**Hyperkalemia is the most immediate life-threatening imbalance seen in AKI. Parenteral fluids, all oral intake, and all medications are screened carefully to ensure that sources of potassium are not inadvertently administered or consumed.

The nurse monitors fluid status by paying careful attention to fluid intake (IV meds should be administered in the smallest volume possible), urine output, apparent edema, distention of the jugular veins, alterations in heart sounds and breath sounds, and increasing difficulty in breathing.

-Accurate daily weights and I&O records, are essential.

Reducing metabolic Rate
-The nurse takes steps to reduce the patients metabolic rate.
-Bed rest may be indicated to reduce exertion and the metabolic rate during the most acute stage of the disorder. Fever and infection, both increase metabolic rate and catabolism, are prevented or treated.

Promoting Pulmonary Function
-Attention is given to pulmonary function, and the patient is assisted to turn, cough, and take deep breaths frequently to prevent atelectasis and respiratory tract infection.
-Drowsiness and lethargy may prevent the patient from moving and turning without encouragement and assistance.
Preventing Infection

- Asepsis is essential with invasive lines and catheters to minimize the risk of infection and increased metabolism. An indwelling catheter is avoided whenever possible due to the high risk of UTI associated with its use but may be required to provide ongoing data required to monitor I&O.

Providing Skin Care

- The skin may be dry or susceptible to breakdown as a result of edema; therefore meticulous skin care is important.
- Excoriation and itching of the skin may result from the deposit of irritating toxins in the patient's tissues.
- Bathing the patient with cool water, frequent turning, and keeping the skin clean and well moisturized and the finger nails trimmed to avoid excoriation are often comforting and prevent skin breakdown.

Providing Psychosocial Support

- Patient with AKI may require treatment with hemodialysis, PD, or CRRT
- The patient and family need assistance, explanation, and support during this period.
  - Purpose of treatment is explained
- The family may be afraid to touch and talk to patient during these procedures, but should be encouraged and assisted to do so.

Care of Patient with Chronic Renal Failure

Educating Patients about Self-Care

- A referral to the nutritionist is made because of the dietary changes required.
- The patient is instructed to check the vascular access device for potency and to use appropriate precautions, such as avoiding venipuncture and blood pressure measurements on the arm with the access device.
- Patients and family need to know what problems to report to the primary provider.
  - Worsening of signs and symptoms of renal failure (nausea, vomiting, change in usual urine output, ammonia odor on breath)
  - Signs and symptoms of hyperkalemia (muscle weakness, diarrhea, and abdominal cramps)
  - Signs and symptoms of access problems (clotted fistula or graft, infection)

  *These signs and symptoms of decreasing renal function, in addition to increasing BUN and serum creatinine levels, may indicate a need to alter the dialysis prescription.*

Continuing Care.

- The importance of follow up examinations and treatment is stressed with the patient and family because of changing physical status, renal function, and dialysis requirements.
- The home care nurse also assesses the patient for further deterioration of renal function and signs and symptoms of complications resulting from the primary kidney disorder, the resulting from the primary kidney disorder, the resulting renal failure, and effects of treatment strategies.
- Patients need education and reinforcement of the dietary restrictions required, including fluid, sodium, potassium, and protein restriction.

Hemodialysis

- Is used for patients who are acutely ill and require short-term dialysis for days to weeks until kidney function resumes and for patients with advanced CKD and ESKD who require long-term or permanent renal replacement therapy.
- Hemodialysis prevents death, but does not cure kidney disease and does not compensate for the loss of endocrine or metabolic activities of the kidneys.
- Most patients receive intermittent hemodialysis that involves treatments three times a week with an average treatment duration of 3-5 hours in an outpatient setting.
- Hemodialysis can also be performed at home by the patient and a caregiver.
The objective of hemodialysis are to extract toxic nitrogenous substances from the blood and to remove excess fluid.

A Dialyzer (aka an artificial kidney) is a synthetic semipermeable membrane through which blood is filtered to remove uremic toxins and a desired amount of fluid.

- The blood with toxins and waste is diverted from the patient to the machine via the use of a blood pump to the dialyzer, where toxins are filtered from the blood and the blood is returned to the patient.

- The toxins and wastes of the blood are removed by diffusion - that is, they move from an area of higher concentration in the blood to move to an area of lower concentration in the dialysate.

  **Dialysate:** A solution that circulates through the dialyzer, made up of all the electrolytes in their ideal extracellular concentrations.

- Excess fluid is removed from the blood by osmosis, in which water moves from an area of low concentration potential (the blood) to an area of high concentration potential (the dialysate bath).

- In **Ultrafiltration** fluid moves under high pressure to an area of lower pressure.

  - This process is much more efficient than osmosis for fluid removal and is accomplished by applying negative pressure or a suctioning force to the dialysis membrane.

- The body's buffer system is maintained using a dialysate bath made up of bicarbonate or acetate, which is metabolized to form bicarbonate. The anticoagulant heparin is administered to keep blood from clotting in the extracorporeal dialysis circuit.

  - Cleansed blood is returned to the body with the goal of removing fluid, balancing electrolytes, and managing acidosis.

**Peritoneal Dialysis**

- Goals of PD are to remove toxic substances and metabolic wastes and to reestablish normal fluid and electrolyte balance.

- PD may be treatment of choice for patients with renal failure who are unable or unwilling to undergo hemodialysis or kidney transplantation.

- Slower rate during PD than hemodialysis.

- Patients with diabetes or cardiovascular disease, many older patients, and those who may be at risk for adverse effects of systemic heparin are likely candidate for PD.

  - Severe hypertension, heart failure, pulmonary edema not response to usual treatment regimens have been successfully treated with PD.

- In PD the peritoneal membrane that covers the abdominal organs and lines the abdominal wall serves as the semi-permeable membrane.

- A sterile dextrose dialysate fluid is introduced into the peritoneal cavity through an abdominal catheter at established intervals.

- Once the sterile solution is in the peritoneal cavity, uremic toxins such as urea and creatinine begin to be cleared from the blood.

- Diffusion and osmosis occur as waste products move from an area of higher concentration (the bloodstream) to an area of lesser concentration (the dialysate fluid) through a semi-permeable membrane.

  - This movement of fluid from the blood into the dialysate fluid is called **clearance**.

**Inserting The Catheter**

- The peritoneal catheter is inserted in the operating room or radiology suite to maintain surgical asepsis and minimize the risk of contamination.