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ESSENTIALS OF MEDICAL SURGICAL NURSING



BT Basavanthappa

2nd Edition

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CHAPTER 4

Nursing Management of Digestive Disorders

INTRODUCTION

The gastrointestinal (GI) system, also termed as the digestive system and alimentary canal, consists of the GI tract and its accessory organs. The GI tract or alimentary canal is a hollow muscular tube that extends from mouth to the anus. Its principal function is to provide the body with fluid, nutrients, and electrolyte. This is accomplished through the processes of ingestion (taking food), digestion (breakdown of food) and absorption (transfer of food products into circulation). Another main function of the GI system is the storage and final excretion of the solid waste products of digestion, i.e. elimination.

The GI system consists of the GI tract, and its associated organs and glands, which includes mouth, esophagus, stomach, small intestine, large intestine, rectum, and anus. The associated organs are the liver, pancreas, and gallbladder. Proper functioning of the GI system is essential to the maintenance of proper nutrition and health. Psychological or emotional factors such as stress and anxiety influence GI functioning in many persons. Stress may be manifested as anorexia, epigastric and abdominal pain or diarrhea. However, GI problems should never be solely attributed to psychological factors. Organic and psychologically-based problem can exist independently or concurrently. Physical factors such as dietary intake, ingestion of alcohol, and cafeine–containing products, cigarette smoking, and fatigue may affect GI function. Some organic diseases of the GI system such as peptic ulcer, ulcerative colitis may be aggravated by stress. These both physical and emotional factors affect the GI functions. So it is very essential for the nurses to understand the disorders of digestive system, because they will come across such clients, and to provide proper nursing services.

NURSING ASSESSMENT OF DIGESTIVE SYSTEM

Assessment of digestive system involves a detailed health history as well as a comprehensive physical examination of the oral cavity, abdomen, rectum and anus. And a review of the client's demographic data.

Demographic Data

A review of the patient's demographic data such as age, sex, culture, religion and occupation is helpful, when assessing GI system, because many GI disorders are associated with it. For example, many GI cancers occur more frequently in the elderly and in males, whereas others are more common in females. Sexual abuse may play role in GI problems in some women. Reproductive cycling in females contribute to other GI manifestations. Duodenal ulcers develop in younger adults, whereas gastric ulcers are more common in middle-aged and older adults.

Past Health History

The nurse collects data about previous hospitalizations, major illness, surgery, use of medications and allergies as a part of past health history.

- Informations should be gathered from the patients about the history or existence of the following diseases or problems related to GI functioning: Abdominal pain, gastritis, nausea, and vomiting, diarrhea, and constipation, hepatitis, colitis, peptic ulcer, abdominal distension, jaundice, anamia, haital hernia, gallbladder disease, dysphagia, heartburn, dyspepsia, changes in appetite, hematemesis, food intolerance, indigestion, excessive gas, bloating, melena, hemorrhoids, hernia, or rectal bleeding. In addition, nurse should ask whether the client currently has or previously had a change in bowel habits, GI bleeding, jaundice, ulcers, colitis, or unexplained weight loss or gain.
- The health history should include an assessment of the patient's past and current use of medications, particularly in relation to liver problems. Because many chemicals and drugs are potentially hepatotoxic (e.g., alcohol, arsenic, carbon tetrachloride, gold compounds, mercury, phosphorous, anabolic steroids, halothane, isoniazed, propylthiouracil, sulfonamides, thiazide diurectics, methotrextate, acetominephen). The nurse should ask the patient if laxatives or antacids are taken, including the kind and frequency. The use of prescription or over the counter appetite suppressant drug should be noted including name, duration, frequency and also any allergies to medication should be noted.
- Information should be obtained about the hospitalization for any problems related to the GI system, including abdominal surgery, rectal surgery, reasons for surgery, postoperative course and possible blood transfusion, etc.

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- The nurse should also have the knowledge about the patient's health practices related to GI system, such as maintenance of normal body weight, attention to proper dental care, maintenance of adequate nutrition and effective elimination habits and patient should be asked about exposure to hepatotoxic chemicals and exposure to hepatitis or parasitic infection. And also patient should be assessed in relation to certain habits like consumption of alcohol and cigarette smoking, which may delay healing of ulcers and lead to liver problems.
- Thorough nutritional assessment is essential. The nurse should ask open-ended questions that will allow the patients to express beliefs and feelings about the diet. The nurse may need to ask the patient to do a 24 hours dietary recall to analyse the adequacy of diet and find out whether patient is taking adequate diet or not. The patient should be questioned about any changes in appetite food tolerance and weight. Anorexia and weight loss may indicate carcinoma. The nurse should ask the patient about allergies to any food and determine what GI symptoms show allergic response cause.
- A detailed account of the patient's bowel elimination pattern should be elicited. The frequency, time of the day, and usual consistency of stool should be noted. The use of laxatives and enema, including type, frequency, and results should be documented. Any recent changes in bowel pattern should be investigated.
- Activity and exercise may affect GI motility. Immobility is risk for constipation. So the patient's ambulatory status may be assessed to determine if the patient is capable of securing and preparing food. Any limitation in it should be noted.
- The patient should be asked if GI symptoms affect sleep or rest. For example, a patient with a hiatal hernia may be awakened because of burning pain, sleep may be improved by elevating the head of the bed for such patients. Hunger can prevent sleep and should be relieved by a light, easily digested snack unless contraindicated. A patient often has bed time ritual that involves the use of a particular food or beverages, e.g., warm milk, herbal tea, etc. should be noted.
- Cognitive-perceptual pattern, i.e. decrease in sensory adequacy can result in problems related to the acquisition, preparation and ingestion of food. For example, changes in taste or smell can affect appetite and eating pleasure. The nurse should assess the patient in this pattern to judge the effect of deficiencies on adequate nutritional intake and pain in another area that requires careful assessment related to its effect on GI system and nutrition. The possible effects of pain medication related to constitution, sedation and appetite suppressive should be assessed.
- Self-perception and Self-concept pattern should be assessed because many GI and nutritional problems can have a serious effect on the patient's self-perception, for example: (1) Overweight and underweight persons often have problems related to self-esteem and body image, (2) The altered physical changes often associated with liver disease can be problematic for the patient, e.g., jaundice, ascitis.
- It is important that the nurse should be aware of the role-relationship pattern of patient. For example, problem related to the GI system such as: Cirrhosis, alcoholism, hepatitis, ostomies, obesity, and carcinoma can have a major impact on the patient's ability to maintain usual roles and relationships.
- It is also important that nurse should ask sensitive questions to determine sexuality-reproductive pattern of the patient, changes related to sexuality and reproductive status on result from problems of the GI system. For example, obesity, jaundice, anorexia, could decrease the acceptance of a potential sexual partner. Chronic alcoholism decreases meaningful sexual relationship. The presence of an ostomy could affect the patient's confidence related to sexual activity. Anorexia can affect the reproductive status of a female patient. Alcoholism can affect the reproductive status of both men and women.
- The nurse should try to determine the coping stress tolerance pattern of the patient, because GI symptoms such as epigastric pain, nausea, and diarrhea develop in many individuals in response to stressful or emotional situations. Some organic GI problems such as peptic ulcers are aggravated by stress. The nurse should also assess the value-belief pattern of the patients, i.e. the patient's spiritual and cultural belief regarding food and food preparations which helps for prescribing food and medication accordingly.

Physical Examination of Digestive System

The physical examination of the digestive system include examination of the oral cavity, abdomen, anus and rectum. *Oral cavity:* Assessment of oral cavity involves inspection and palpation. The nurse puts on gloves, faces the client and begins by inspecting the lips. For observation of abnormalities of color, lesions, nodules and symmetry. The abnormalities of lips include pallor, or cyanosis, cracking ulcer, or fissure using a tonge blade. The nurse should inspect the buccal mucosa and not the color, any areas of pigmentation or any lesion. In assessing teeth and gums, nurse should look for caries, abnormal shape and position of teeth, and swelling, bleeding, discoloration or inflammation of gingivae. Any distinctive breath odor should be noted. The pharynx should be inspected for any abnormalities. Abnormalities of mouth include thrush, leukoplakia, white plaques with red patches, cancer sore, etc.

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The nurse should palpate any suspicious area in the mouth such as ulcer, nodules, indurations and areas of tenderness should be palpated. It should be noted that if patient having any dentures or partial appliances should be removed when examining the oral cavity.

Abdomen

To assess the patient's abdomen, have the client lie in a supine position with the arms at the sides. Bending the knees slightly helps to relax the abdomen muscles. Begin in the patient's right lower quadrants and proceed in clockwise manner. When assessing the abdomen, the nurse proceeds the following sequence: Inspection, auscultation, percussion and palpation. The sequence may vary according to situations:

- *Inspection:* The nurse should inspect the abdomen for skin changes (color, texture, scars, striae, dilated veins, rashes and lesions), umbilicus (location and contour) symmetry, contour (flat, rounded, carved, concave, protuberant, distention), observable mass (hernias or other masses) and movement (pulsations and peristalsis).
- *Auscultation* of the abdomen begins by listening with the diaphragm of the stethoscope, which provides information on bowel and vascular sounds. The stethoscope is lightly pressed on the abdominal wall in all four quadrants. Begin in the right lower quadrant at the ilecaecal valve area because bowel sounds are normally present there. Normal bowel sounds occur 5 to 35 times per minute and sound like high-pitched clicks or gurgles. The nurse should listen for bowel sounds for 2 to 5 minutes. Bowel sounds cannot be described as absent until no sound is heard for 5 minutes in each quadrant. The frequency and intensity of the bowel sounds vary depending on the phase of digestion. Loud gurgles indicate hyperperistalsis termed as 'borborygoni (stomach growling). Terms used to describe bowel sounds include, present, absent, increased, decreased, high pitched, tinkling, gurgling and rushing.
  The nurse uses the bell of the stethoscope to auscultate vascular sounds. Three abnormal sounds should be listened for: A bruit, a venous hum, or a friction rub. The nurse listens over the aorta, renal arteries, and iliac arteries. A bruit is heard over the aorta which indicates presence of aortic aneurysm. A continuous venous hum heard in preumbilical area indicates engorged liver circulation. Friction rub indicates hepatic tumor or splenic infarction.
- *Percussion* of the abdomen is to determine the size and location of the abdominal organs and to detect fluid, air and masses. The nurse uses percussion in all four quadrants and compare sounds. Normally, percussion sounds over the abdomen are tympanic (high-pitched loud or musical over gas) or dull (thud-like sounds over fluid or solid organs).
  To percuss the liver, the nurse should start below the umbilicus in the right midclavicular line and percuss lightly upward until dullness is heard, thus determining the lower border of liver dullness. After the lower border of the liver has been determined, the nurse should start the nipple line in the midclavicular line and percuss downward between ribs to the area of dullness indicating the upper border of the liver. The height or vertical space between two areas should be measured to determine the size of the liver. Dull sounds normally occur over the liver and spleen or a bladder filled with urine. Abnormal findings occur because of the presence of ascites or abnormal masses.

  Interpretation of Common Finding of Inspection
  - Scars on strials may be result of pregnancy, obesity, ascites, tumors edema, surgical procedure, or healed burned areas.
  - Engorged veins may be caused by obstruction of vena cava or portal vein and circulation from abdomen.
  - Skin color observe for evidence of jaundice, or inflammation (redness).
  - Visible peristalsis may be caused by pyrolic or intestinal obstruction; normally peristalsis not visible except the slow waves in thin persons.
  - Visible pulsation normally slight pulsation of aorta is visible to epigastric region.
  - Visible masses and altered contour observe for hernia, distension of ascites, and obesity; instructing patient to cough may bring hernia 'bulge or elicit pain or discomfort' in the abdomen, marked concavity may be caused by malnutrition.
  - Spider angioma appear on the upper portion of the body and blanch with pressure: Commonly result from liver disease.

  Interpretation of Common Findings from Auscultation
  - Absence from Sounds in 5 minutes may be due to peritonitis, paralytic ileus, pneumonia, and hypokalemia.
  - Repeated, high-pitched sounds occurring at frequent intervals. Increased peristalsis heard in gastroenteritis, early pyloric obstruction, early intestinal obstruction, and diarrhea.
  - Bruit presence of abnormal sounds (turbulence of blood flow through partially occluded or diseased aorta or renal artery).
  - Hum and friction rub heard over liver and splenic areas, indicating an increased venous blood flow, possibly related to peritoneal inflammation.
- Palpation is of value in determining the outlines of the abdominal organs, determining the presence and characteristics of any abdominal masses, and identifying the presence of direct tenderness, guarding, rebound tenderness and muscular rigidity.

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Light palpation is used to detect tenderness or cutaneous hypersensitivity, muscular resistance, masses, and swelling. The nurse uses the pads of the fingertips with the finger together, and press gently, depressing the abdominal wall about 1 cm. All quadrants are palpated using smooth movement.

Deep palpation is used to delineate abdominal organs and masses. The palmar surface of the fingers should be used to press more deeply. Again all quadrants should be palpated. When palpating masses, the nurse should note the location, size, shape and presence of tenderness. The patient's facial expression should be observed during these maneuver, because it will give non-verbal cues of discomfort or pain.

An alternate method for deep abdominal palpation is the two-hand method. One hand is placed on the top of the other. The fingers of the top hand apply pressure to the bottom hand. The fingers of the bottom hand feel for organs and masses.

To palpate nurse's left hand is placed behind the patient to support the right eleventh and twelth rib. The patient may relax on nurse's hand. The nurse should press the left hand forward and place the right hand on the patient's right abdomen lateral to the rectus muscle. The fingertips should be below the lower border of liver, dullness and pointed towards the right costal margin. The nurse should gently press in and up. The patient should take deep breath with the abdomen so that liver drops and is in a better position to be palpated. The nurse should try to feel the lower edge as it comes down to the fingertips. The liver edge should be firm, sharp and smooth. Any abnormality should be noted.

To palpate spleen, the nurse moves to the left side of the patient. The nurse places the left hand under the patient and supports and presses the patient's left lower rib cage forward. The right hand is placed below the left costal margin and pressed it in towards the spleen. The nurse should ask the patient to breathe deeply. The tip or edge of an enlarged spleen will be felt by the fingertips. The spleen is normally not palpable.

Rectum and Anus

Examination of the anus and rectum is potentially embarrassing and uncomfortable for the patient. The nurse uses a gentle approach and a matter-of-fact manner. The client's position depends on the circumstances of the examination. A female client may be examined while in the lithotomy position immediately following assessment of the genitalia, in the Sim's position or in a dorsal recumbent position. A male client may be examined in the Sim's position or while standing and leaning across the examination table, a position which facilitates palpation of the prostate gland.

Clients are draped accordingly. For the digital examination of the rectum the gloved lubricated index finger is placed against the anus while the patient strains (Valsalva maneuver). Then as the sphincter relaxes, the finger is inserted. The finger is pointed towards the umbilicus. The nurse should try to get the patient to relax. The finger inserted into the rectum as far as possible, and all surfaces are palpated. Nodules, tenderness or any irregularities should be assessed. A sample of stool can be removed with the gloved finger and should be checked for occult blood. Abnormal findings may include pruritus ani, coccygeal or pilonidal sinus, tract openings, fistulas, fissures, external haemorrhoids, rectal prolapse, and internal hemorrhoids, etc.

DIAGNOSTIC STUDIES IN DIGESTIVE SYSTEM

Number of examinations and tests performed for diagnosis of problems of the digestive system are both consuming and unpleasant. Several tests are intrusive procedures that are uncomfortable and embarassing for the patient which results in added stress for the patient. It remains the nurse's responsibility to meet the educational and psychological needs of the patient by answering questions concerning the test procedure, rationale for its use and specific test preparation in a caring manner.

Laboratory Tests

Numerous tests may be used as a part of the evaluation of the GI biliary, and exocrine pancreas function. The main blood and urine tests are as follows:

Blood Tests

- *Stomach gastrin test:* Gastrin is a gastric hormone that is a powerful stimulus for gastric acid secretion. Elevated levels are found in those with pernicious anemia and Zollinger-Ellison syndrome. The normal gastrin value is less than 200 dg/ml (200 mg/L)
- Helicobacter pylori detected in serum is a highly sensitive but less specific, indicator of an active infection. *H. pylori* infection predisposes to peptic ulcer disease.
- *Total bilirubin test:* Bilirubin is exerted in the obstruction in the biliary tract contribute primarily to a rise in conjugated (direct) values. The normal value 0.1 to 1.0 mg/dl, conjugaged 0.1–0.3 mg/dl, unconjugated 0.1–0.8 mg/dl.
- *Alkaline phosphate:* It is found in many tissues with high concentration in bone, liver and biliary tract epithelium. Obstructive biliary tract disease and carcinoma may cause significant elevations. The normal value is 30–85 1nu/ml.
- *Amylase:* It is secreted normally by the acinar cells of the pancreas. Damage to these cells or obstruction of the pancreatic duct causes the enzyme to be absorbed into the blood is significant quantities. It is a sensitive yet non-specific test for pancreatic disease. The normal value is 80–150 somogyl units.

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- *Lipase:* It is a pancreatic enzyem normally secreted into the duodenum. It appears in the blood when damage occurs to the acinor cells. It is a specific test for pancreatic disease. The normal value 0-110 units/L.
- Calcium levels may be low in cases of severe pancreatitis or steatorrhea because calcium soaps are formed from the sequestration of calcium by fat necrosis. The normal value is 9.0-11.5 mg/dl.
- Total protein of blood includes albumen and globulin. Although primarily a reflection of liver function, serum protein level is also a meausre of nutrition. Malnourished patients have greatly decreased levels of blood protein. The normal protein is 6.8 g/dl (Albumin 3.2-4.5 g/dl, Globulin 2.3-3.4 g/dl).
- *D-xylose absorption test:* D-xylose is a monosaccharide that is easily absorbed by the normal intestine but not metabolized by the body. D-xylose is administered orally and assists in the diagnosis of malabsorption. Normally blood levels of 25–40 mg/dl 2 hr after ingestion.
- *Lactose tolerance test:* An oral dose of lactose is administered. In the absence of intestinal lactase, the lactose is neither broken down nor absorbed and plasma glucose levels do not rise. The test assists in the diagnosis of lactose intolerance. Normally rise in blood glucose level is more than 20 mg/dl.
- *CEA test:* Carcinoembryonic antigen is a protein normally present in fetal gut tissue. It is typically elevated in persons with colorectal tumours. It is useful in determining prognosis and response to therapy. The normal value is less than 5 mg/ml.

Urine Tests

- *5-Hydroxyindoleacetic Acid (5-HIAA):* Carcinoid tumors are serotin in secreting and are derived from neuroectoderm tissue, e.g., the appendix and intestine. These neurohormones are metabolised to 5-HIAA by the liver and excreted in urine. The normal value is 2–5 mg/2 hr.
- *Urine Bilirubin:* Bilirubin is not normally excreted in the urine. Biliary structure, inflammation, or stones may cause its presence.
- *Urobilinogen:* A sensitive test for hepatic or biliary diseases. Decreased levels are seen in those with biliary obstruction and pancreatic cancer. In 24-hour collection, urobilinogen is 0.2–1.2 units and 0.05–2.5 mg.
- *Urine Amylase:* Normally 10-80 amylase units/hour. A rise in levels usually minimises the rise in serum amylase. The level remains elevated for 7-10 days; however, which allows for retrospective diagnosis.

Stool Examination

Stool specimens are collected primarily for culture, determination of fat content, and examination for the presence of ova, parasites, and fresh or occult blood. Stools to be analyzed for the presence of bacteria, i.e. *Salmonella*, *Shigella*, *Staphylococcus aureus*. Detection of occult blood in the stool is useful in identifying bleeding in the GI Tract occult blood may be identified by one of the three tests—*guaiac test (hemoccult)*, *benzidine*, or *orthotobrdine (occultest)*.

The color of the stool also indicates few cues for the following:

- Brown : Presence of fecal urobilinogen
- White : Barium
- Gray, tan (clay) : Lack of bile, biliary obstruction
- Black : Tarry-Upper GI bleeding.
  Dry-Rapid peristalsis with bile presence
- Green : Rapid peristalsis with bile presence

RADIOLOGICAL STUDIES

Upper GI or Barium Swallow

It is a X-ray study with fluoroscopy with contrast medium. This is used to diagnose structural abnormalities of the esophagus, stomach and duodenal bulb. The nurse's responsibility in this procedure includes:

- Explain procedure to patient and that patient will need to drink contrast medium and assume various positions on X-ray table.
- Keep patient NPO (nil per oral) for 8-12 hours before procedure.
- Tell the patient to avoid smoking after midnight, the night before the study.
- After X-ray test, take measures to prevent contrast medium impaction (fluids, laxatives).
- Tell patient that stool may be white upto 72 hours after test.

Small Bowel Series

In this contrast medium is ingested and flat film taken q 20 min until medium reaches terminal ileum. Here the nurse's responsibilities are as stated in barium swallow.

These procedures are used to identify esophageal and stomach disorder such as strid varices, polyps, tumors, hiatal hernia and peptic ulcers.

Lower GI or Barium Enema

It is fluoroscopic X-ray examination of colon, used contrast medium, which is administered rectally (enema). Double contrast or air contrast barium enema is test of choice. Air is infused after barium is evacuated. The nurse's responsibility in barium enema includes:

- Before the procedure, administer laxatives and enema until colon is clear of stool evening before procedure.
- Administer clear liquid diet evening before procedure.
- Keep patient NPO for 8 hours before test.

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- Instruct patient about being given barium by enema.
- Explain that cramping and urge to defecate may occur during procedure and that patient may be placed in various positions on tilt table.
- After the procedure give fluids, laxatives or suppositories to assist in expelling barium.
- And observe stool for passage of contrast medium.

This procedure identifies polyps, tumors and other lesion in colon.

Oral Cholecystogram (Gallbladder Series)

It is X-ray examination visualizes gallbladder (GB) after radiopaque dye, such as iopanoic acid (Telepaque) has been ingested orally. It is used to determine the GB ability to concentrate and store dye and to observe the patency of the biliary duct system. It also may be used to detect gallstones, obstructions of the biliary tract, and other GB disorders. In this procedure, the nurse's responsibilities will include:

- Assess patient for sensitivity to iodine, (telepaque contains iodine).
- Administer radiopaque dye evening before test.
- Give 6 tablets (3q) 1q 5 minutes.
- Explain that patient may need 2 consecutive days of dye ingestion.
- Keep patient NPO after ingestion of dye.
- Observe for side effects of dye, such as nausea, vomitting, diarrhea.
- May give fatty test meal after X-ray test to check for GB emptying.
- Assess patient's medication for possible contraindications, precautions or complications with the use of dye.

Cholangiography

Cholangiogram: In the X-rays are used to visualize biliary duct system after IV injection of radiopaque dye, the nurse's responsibilities in the procedure will include:

- Keep patient NPO for 8 hours prior to procedure.
- Assess sensitivity to iodine dye.
- During injection of dye, assess for urticaria, extreme flushing and respiratory distress.
- Assess patient's medications for possibly contraindication, complications, with the use of dye. Percutaneous transhepatic cholangiogram. This is performed after local anesthesia. Liver is entered with long needles (under fluoroscopy) bile duct is entered, bile withdrawn and radiopaque dye injected. Fluoroscopy is used to determine filling of hepatic and biliary ducts. The nurse's responsibilities are:
- Observe patient for signs of hemorrhage or bile leakage.
- Assess patient's medications for possible contraindications precautions or complications with the use of dye. Surgical cholangiogram is performed during surgery on biliary structure such as gallbladder, contrast medium is injected into common bile duct. The nursing responsibilities are:
  - Explain the patient that anesthetic will be used.
  - Assess patient's medications for possible contraindications, precautions, or complications with the use of dye.

Ultrasound

This non-invasive procedure uses high frequency sound waves (ultrasound waves), which are passed into body structures and recorded as they are reflected (bounded). A conductive gel (lubricant jelly) is applied to the skin and a transducer is placed on the area. In these procedures nurses should be aware that patient's bowel must be cleaned, because of the presence of solid material in GI tract, causes change in reflected sounds and that ultrasound is not transmitted well through gas or air. Schedule test before upper GI or barium enema:

- Abdominal ultrasound study detects abdominal masses (tumors and cysts) and is also used to assess ascites.
- Hepatobiliary ultrasound study detects subphrenic abscesses, cysts, tumors, cirrhosis and is used to visualize biliary ducts.
- GB ultrasound study detects gallstones (high degree of accuracy) and can be used for a patient with jaundice, or allergic reaction to GB contrast media. The nurse's responsibilities include:
  - Administer clear liquids for 24 hours before examination.
  - Give laxatives evening before and cleansing enema morning of examination.
  - Keep patient NPO 8 hours prior to procedure.

Nuclear Imaging Scans

The purpose of nuclear imaging scans is to show size, shape, and position of organ. Functional disorders and structural defects may be identified. Radionuclide (radioactive isotope) is injected IV and a counter (scanning) device picks up radioactive emission, which is recorded on paper. Only tracer doses of radioactive isotopes are used. In these procedures, nurses use to:

- Tell patients that substances contain only traces of radioactivity and pose little to no danger.
- Schedule no more than one radionuclide test on the same day.
- Explain to patient need to lie flat during the scanning.
  - Gastric emptying studies: A Radionuclide study is used to assess ability of stomach to empty solids or liquids. In solid emptying study, egg white containing Tc 99m is eaten. In liquid emptying study, orange juice with Tc 99 m is drunk. Sequential

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images from gamma camera are recorded q2 minutes for upto 60 minutes. Study is used in patients with emptying disorders from peptic ulcer, ulcer surgery, diabetes and gastric malignancy.

– Liver and spleen scan: Here patient is given IV injection of Tc 99m and positioned under camera to record distribution of radioactivity in liver and spleen. In normal person, intensity of liver and spleen images is equal. Test is useful in detecting hepatomegaly hepatocellular diseases, hepatic malignancy and splenomegaly.

Computed Tomography (CT)

Computed tomography (CT) is a non-invasive radiological examination combines special X-ray machine used for CT (exposures at different depth) with computer. This study detects mainly biliary tract, liver and pancreatic disorders. Use of contrast medium accentuates density differences and helps detect biliary problems. In this procedure, nurses are used to explain procedures to patient and determine sensitivity to iodine if contrast material is used.

Magnetic Resonance Imaging (MRI)

MRI is a non-invasive procedure using radiofrequency waves and a magnetic field. This procedure is used to detect hepatic metastasis, sources of GI bleeding, and to stage colorectal cancer. The nurse's responsibilities in MRI includes:

- Keep patient NPO for six hours prior to procedure.
- Explain procedure to patient.
- This procedure contraindicated in patient with metal implants (e.g., pacemaker), or who is pregnant.

ENDOSCOPIC EXAMINATION

Endoscopy refers to the direct visualization of a body structure through a lighted instrument (scope). Most of the GI tract can be visualised by endoscopy, especially with the flexible fibroptic scopes. The fiberscope is an instrument channel through which biopsy forceps and cytology brushes may be passed. Cameras may be attached and pictures taken. Endoscopy is frequently done in combination with the biopsy and cytologic studies. The major complication of GI endoscopy is perforations through the structure being scooped. All endoscopic procedures required informed, written consent.

Esophago-gastro-duodenoscopy

Esophago-gastro-duodenoscopy is a technique directly visualizes mucosal lining of esophagus, stomach and duodenum with flexible, fibroptic endoscope. Tests may use video imaging to visualize stomach motility, inflammations, ulcerations, tumors, varices, or Mallory-weiss tear may be detected. The nursing responsibility in this procedure includes:

- Keep patient NPO for 8 hours prior to the procedure.
- Make sure signed consent is on chart.
- Give preoperative medication if ordered (diazepam, midazolam, or meperidine).
- Explain to patient that local anesthetic may be sprayed on throat before insection of scope and that patient will be sedated during procedure.
- After procedure, keep patient NPO until gag reflex returns.
- Gently tickle back of throat to determine reflex.
- Use warm saline gargles for relief of sore throat.
- Check temperature q 15-30 minutes for 1-2-hours (sudden temperature spike is sign of perforation).

Colonoscopy

Study directly visualizes entire colon upto iliocecal valve with flexible fiberoptic scope. Patient's position is changed frequently during procedure to assist with advancement of scope to cecum. Test is used to diagnose inflammatory bowel disease, detect tumors, and dilate strictures. Procedure allows for removal of colonic polyps without laparotomy. The nursing responsibilities in this procedure will include:

- Before the procedure, keep patient on clear liquids 1-3 days.
- Keep patient NPO for 8 hours prior to procedure.
- Make sure signed consent is on chart.
- Administer laxatives 1-3-days before and enema night before.
- Explain to patient some information regarding insertion of scope as for sigmoidoscopy.
- Explain to patient that sedation will be given.
- Administer alternate preparation of 1 glass of golytely or colyte evening before (8 oz glass q 10 min).
- On morning of procedure, allow clear liquids.
- After the procedure, be aware that patient may experience abdominal cramps caused by stimulation of peristalsis because the patient's bowel is constantly inflated with air during procedure.
- Observe for rectal bleeding and signs of perforation (e.g., malaise, abdominal distentions).

Endoscopic Retrograde Cholangiopancreatography (ERCP)

In ERCP fiberoptic endoscope is inserted through the oral cavity into descending duodenum, then common bile and pancreatic ducts are cannulated. Contrast medium is injected into ducts and allows for direct visualization of structures. Technique can also be used to retrieve a gallstone from distal GBD, dilate structures, biopsy tumors diagnose pseudocysts. In this procedure, the nursing responsibilities will include the following:

- Before the procedure, explain procedure to patient including patient's role.

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- Keep patient NPO 8 hours prior to procedure.
- Ensure consent form is signed.
- Administer sedation immediately before and during procedure.
- Administer antibiotics if ordered.
- After the procuedure, check vital signs.
- Check for signs of perforation or infection.
- Be aware that pancreatitis is most common complication.
- Check for return of gag reflex.

Peritoneoscopy (Laparoscopy)

Peritoneal cavity and contents are visualized with laparoscope. Biospy specimen may also be taken. Double puncture peritoneoscope permits better visualization of abdominal cavity, especially liver. This technique can eliminate need for exploratory laparotomy in many patients. In this, following are the "nursing responsibilities".

- Make sure signed permit is on chart.
- Keep patient NPO 8 hr before study.
- Administer preoperative sedative medication.
- Ensure that bladder and bowel are emptied.
- Instruct patient that local anaesthesia is used before scope insertion.
- Observe for possible complications of bleeding and bowel perforation after the procedure.

LIVER BIOPSY

It is an invasive procedure; uses needle inserted between sixth and seventh or eighth and ninth intercostal spaces on the right side to obtain specimens of hepatic tissue. The nurse's responsibilities include:

- Check patient's coagulation status (PT, CT, BT) prior to procedure.
- Ensure patient's blood is typed and cross matched.
- Take vital signs as baseline data.
- Explain holding breath after expiration when needle is inserted.
- Ensure that informed consent has been signed.
- After the procedure, check vital signs to detect internal bleeding, q 15 min × 2, q 30 min × 4, q 1 hr × 4.
- Keep patient lying on right side for minimum 2 hours to splint puncture site.
- Keep patient on bed in flat position for 12-14 hours.
- Assess patient for complications such as bile peritonitis, shock pneumothorax.

PROBLEMS OF MOUTH

Ingestion is the process of taking food and fluids into the body via the GI tract. It begins in the mouth with mastication of food by teeth. Food then passes down the esophagus and into the stomach. It is important that sufficient nutrient is ingested to meet bodily requirements. Oral problems, such as poor dental health, infections and inflammation and cancer interfere with ingestion.

Dental Problems/Tooth and Gum Disorder

Tooth decay is by far the most common problem affecting the teeth termed as "dental caries". It is the result of a pathological process that causes the gradual destructions of the enamel and dentin of the teeth. Caries development starts when 'plaque' builds up and adheres to the teeth. Plaque is a gelationous substance consisting of bacteria, saliva and epithelial cells.

Prevention is the most appropriate management of dental problem, which includes:

- Widespread fluoridation of water supplies reduces dental decay. Fluoride makes tooth enamel more resistant to acids and is commonly added to drinking water in many localities. It is widely available in toothpastes, dental rinses and mouthwashes.
- Early treatment of periodontal disease consists of scaling and root planning.
- Scaling is the removal of calculus and root planning is the smoothening of root surfaces. Gingivectomy and gingivoplasty may be necessary.

ORAL INFECTIONS AND INFLAMMATION

Any of the structures of the mouth may develop infections when oral infections and inflammations are present, they can severely or seriously affect the ability of the patient to adequately and comfortably ingest food and fluids by mouth. These infections are inflammations; may be specific mouth disease or they may occur in the presence are inflammation may be specific mouth disease or they may occur in the presence of some systemic disease such as leukemia or vitamin deficiency.

Pathophysiology

The structure of the mouth causes many ulcerative diseases to have similar signs and symptoms. The mucus throughout the mouth is thin, and evolving vesicles and bullae break open rapidly into ulcers. The ulcers are typically further traumatized by the teeth and can become readily infected by the abundant oral flora. Many of the causative organisms are the same on those that cause common skin infections. The common inflammation and infections of the oral cavity are as follows. With this etiology, there comes clinical manifestation and treatment.

- *Gingivitis:* Inflammation of the gingivae in the early form of periodontal disease. It may occur due to neglected oral hygiene, malocclusion, missing or irregular teeth, faulty dentistry, eating of soft rather than fibrous foods.

  The clinical manifestation include inflammed gingivae and interdental papillae, bleeding during toothbrush-

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ing, development of pus, formation of abscess with loosening teeth (Periodontitis).

Treatment include prevention through health teaching, dental care, gingival massage, professional cleaning of teeth, non-fibrous foods, conscientious brushing habits with flossing.

- *Vincent's angina* (Necrotizing ulcerative gingivitis, Trench mouth): It is an acute bacterial infection of the gingivae, caused by a tremendous proliferation of normal mouth flora, such as spirochetes and fusiform bacilli. It is commonly triggered by poor oral hygiene, nutritional deficiencies (B and C vitamins), alcoholism, infections, or immunocompromise.

  The clinical manifestations are, painful bleeding gingivae, eroding necrotic lesions of interdental papillae, ulceration than bleed, increased saliva with metallic taste, fetid mouth odor, anorexia, fever and general malaise.

  The nursing measure will include: advising the patient to take rest (physical and mental), avoidance of smoking and alcoholic beverages, advice soft nutritious diet, correct oral hygiene habits, topical application of antibiotics, mouth irrigations with H_2O_2 and saline solutions.
- *Oral candidiasis* (monilasis or thrush): is caused by an increase in the level of Candida albicans, a yeast-like fungus is normally found in the skin, GI tract, vagina and oral cavity. Overgrowth of the organism may result from antibiotic depletion of normal flora (prolonged high dose of antibiotics) or immunosupresors from steroid therapy, chemotherapy or HIV infections.

  The clinical manifestations are pearly, bluish white (creamy white) "milk-curd" membranous lesions on mucosa of mouth and larynx, sore mouth, yeasty halitosis. The conditions is painful and if widespread, can interfere with oral nutrition. When mucosa bleeds, and ulcerates when patches are scraped off.

  Treatments include nystatin, or amphotericin B as oral suspension or buccal tablets, good oral hygiene. Oral nystatin, ketoconazole, clotrimazole; amphotericin for the immuno-compromized person.
- *Herpes simplex stomatitis* (cold sore, fever-blister): It is an externally common viral infection that produces characteristic blisters commonly called 'cold sore' or fever blister. It is caused by herpes simplex virus, type I or II, predisposing factors of upper respiratory infections, excessive exposure to sunlight, food allergies, emotional tensions, onset of menstruation.

  The virus is harboured in a dormant state by cells in the sensory nerve ganglia. Reactivation of the virus can occur with emotional stress, fever, exposure to cold or ultraviolet rays. The lesion appears most commonly on the mucus membranous border junction of the lips in the form of small vesicles, which then erupt and form painful, shallow ulcers. Vesicle formation may be single or clustered. Painful vesicles and ulceration of mouth, lips or edge of nose; may have prodromal itching or burning, fever, malaise, lymphadenopathy may occur.

  Treatment is palliative, which include mild antiseptic mouthwash. Application of spirits of camphor, corticosteroid cream, viscous lidocaine, removal or control of predisposing factors, topical or systemic antiviral agents, e.g., acyclovir (zovirax) in severe cases.
- *Aphthous stomatitis* (Cancer sore): It is a recurrent and chronic form of infection secondary to systemic disease, trauma, stress or unknown causes. It produces well circumscribed ulcers on the soft tissues of the mouth, including lips, tongue, insides of the cheeks, pharynx and soft palate. Ulcers of the mouth and lips causing extreme pain, ulcers surrounded by erythematous base. Painful small ulceration on oral mucosa heals in 1 to 3 weeks.

  Treatment is palliative; includes mouthwashes, hydrocortisone, antibiotic ointment, fluocinonide (Lidex ointment in orabase), Corticosterdoid (topical or systemic) tetracycline oral suspension for children.
- Parotitis is an inflammation of the salivary or parotid glands. The viral inflammation known as "mumps" in children.

  Parotitis usually caused by staphylococcus species, *Streptococcus* species (occasionally). Acute bacterial parotitis typically occurs in debilitated or elderly patients in whom dehydration, minimal oral intake, or medication have resulted in chronic dry mouth. Poor oral hygiene also causes parotitis. Acute parotitis occurs in postoperation patient called "surgical mumps".

  The clinical manifestations are: Pain in the glands with an abrupt onset, i.e. pain in area of gland and ear, absence of salivation, purulent exudate from duct of gland, fever and swelling.

  Treatment includes application of heat and cold, frequent oral hygiene, adequate hydration, broad spectrum antibiotics, occasionally needed. Nursing measures are mouthwashes, warm compresses, preventive measures such as chewing gum, sucking on hard candy (Lemon drops) adequate fluid intake.
- Stomatitis is the inflammation of the mouth caused by trauma, pathogens, irritants (tobacco, alcohol) renal, liver and hematologic disorders, side effects of many cancer chemotherapeutic drugs.

  The clinical manifestation is excessive salivation, halitosis, sore mouth.

  Treatment includes, removal or treatment of cause, oral hygiene with soothing solutions, topical medication, soft, bland diet.

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ORAL CANCER

Carcinoma of the oral cavity may occur on the lips or anywehre within the mouth which includes tongue, floor of the mouth, buccal mucosa, hard palate, soft palate, pharyngeal walls and tonsils.

Etiology

The development of oral cancer is clearly linked to a history of smoking and alcohol consumption and the risk increases strongly with heavy use. The exact cause of oral cancer is not clear, but there are number of predisposing factors which includes:

- Constant over-exposure to ultraviolet radiation from the sun, for cancer lips.
- Tobacco usage (smoking and chewing), i.e. pipe and cigarette smoking, snuff, chewing tobacco.
- Chronic alcohol intake (excessive use of alcohol).
- Chronic irritation (jagged tooth, ill-fitting prosthesis, chemical or mechanical irritants).
- Ruddy fair complexion leads to lip cancer.
- Syphilis, immunosuppression leads to lip cancer.
- Recurrent herpetic lesions.
- Poor oral hygiene.
- Hot and spicy foods or drinks.
- Malnutrition.
- Cirrhosis of the liver.
- Age over 45 years.
- Family history of oral cancer.

Pathophysiology

The vast majority of oral cancer arise from the squamous cells, which line the surface, oral epithelium, epidermoid, basal cell and other carcinoma may arise. The majority of tumors arise on the lateral or ventral surfaces of the tongue, although rarely on the dorsal surface, and commonly go unnoticed by the patients. A single ulcer is the typical pattern. The tongue has an abundant vascular supply and lymphatic drainage channels, and spread of the cancer to adjacent structures may be rapid. Metastasis to the neck has already occurred in 60% of patients at the time of the diagnosis is made. The mortality rate is high, early metastasis is rare, although rapid extension to the mandible or floor of the mouth is possible. Tumors that involve the parotid gland are usually benign, although those arising submaxillary glands have a high rate of malignancy and tend to grow rapidly.

Clinical Manifestations

Many oral cancers are asymptomatic in the early stages. The premalignant lesions of the oral cavity are:

- Leukoplakia—is a potentially precancerous, yellow-white or grey white lesions may occur in any region of mouth also called "white patch" or "smoker's patch". Leukoplakia is the result of chronic irritation usually from the smoking and Candida infection.
- The patch becomes keratonical (hard and leathery) is sometimes described as hyperkeratosis.
- Erythroplasia—is a red, velvety-appearing patch that is often indicative of early squamous cell carcinoma occur on the mouth or tongue. These may turn to malignant.

Cancer of the lip usually appears as an indurated, painless ulcer on the lip. The first sign of carcinoma of tongue is ulcer or area of thickening. Soreness or pain of the tongue may occur, especially on eating hot or highly-seasoned foods. Cancer lesions are most likely to develop in the proximal half of the tongue. Later symptoms of cancer of the tongue include increased salivation, slurred speech, dysphagia, toothache, and earache.

Approximately 30% of oral cancer present with an asymptomatic neck mass. Anyhow, the common clinical manifestation of oral cancer are as follows:

- Masses in the mouth or neck.
- Chronic ear pain.
- Enlarged lymph nodes (cervical nodes are commonly affected).
- Discomfort or burning.
- Ulcer on lateral or ventral surface of the tongue or elsewhere.
- Dysphagia.
- Visible lesions on lips or elsewhere.
- Presence of erythroplasia (bright red, velvety leisions).

Diagnostic Study

- Biopsy of the suspected lesion with cytologic examination. It may be used to evaluate lymph nodes, leukoplakia or erythroplasia.
- Ultrasonography is an excellent adjust to evaluate masses that are closed to the surface.
- Computed tomography (CT) scans may be used to evaluate deeper, less definite masses.
- Magnetic resonance imaging (MRI) is most useful in the effort to evaluate deep masses of the inconclusive structure.

Treatment

Treatment of oral cancer depends on the location and staging of the tumor. Early-stage cancer is usually treated by either radiation or surgery, depend upon the size and accessibility of the tumor. More invasive cancers may require both modalities and advanced cancers are treated palliatively.

Radiation Therapy for Oral Cancer

Early lesions are highly curable with radiation, if they are confined to the mucosa, and the use of radiation prevents widespread tissue destruction. Radiation may be delivered

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ESSENTIALS OF MEDICAL SURGICAL NURSING

Essentials of Medical Surgical Nursing is based on course and curricula of nursing students. It is designed to provide nursing students with the knowledge and skill they need to become competent, think critically and possess the sensitivity to become caring nurses. In this changing world on health care delivery system, nurses will need broad knowledge to provide the expert care in Nursing Profession. In view of these changes, this book is organized into 20 chapters. Ideally, the text is flowed sequentially, but every effort has been made to respect the differing needs of diverse curricula and students. Thus, each chapter stands on its own merit and may be read independently of others. Every attempt has been made to maintain simplicity and lucidity of language and style, so that student can grasp the subject very clearly and completely.

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