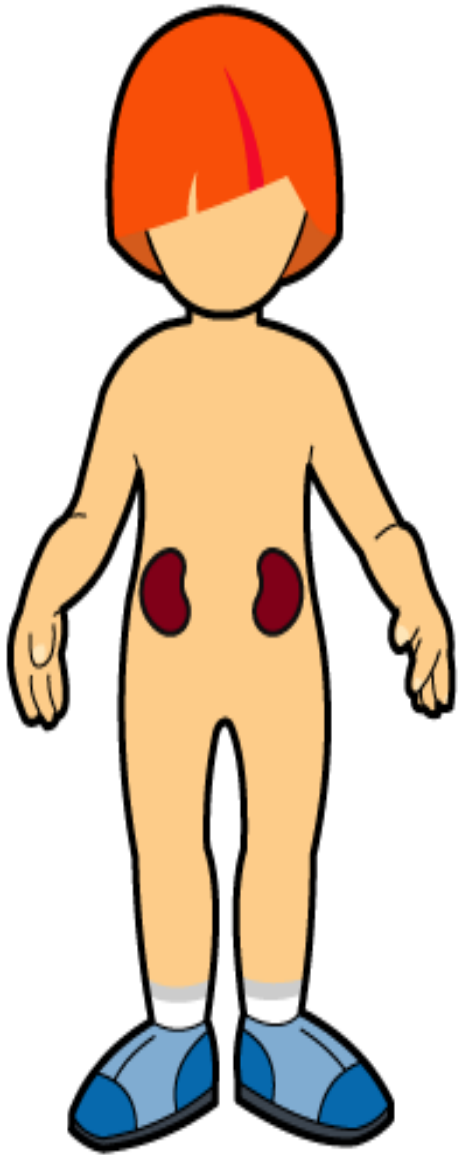


# Urinary Elimination

## Factors affect voiding

## Altered urinary elimination

## Nursing management

# Physiology of Urinary Elimination

- Urinary elimination is essential to health.
- It depends on effective functioning of urinary tract organs: kidney, ureters, bladder, and urethra.
- **Urination**: micturition, voiding & urination all refer to the process of emptying the urinary bladder.

✓Nerves stimulation occurs when adult bladder contains between 250-450 ml of urine while in children 50-200 ml.

✓Normal urine output should be more than 30 ml/hour.

# Factors affecting Urination

**1-Growth and Developmental Factors**

**Infants:** have immature kidneys they develop control between 2-5 years of age.

**Toddlers and Preschoolers**. urine is concentrated effectively and appears a normal amber color.

**School-Age Children**. Elimination system reaches maturity. The kidneys double in size between ages 5 and 10 years

**Adults**. kidneys reach maximum size between 35 and 40 years of age.

After age 50 the kidneys begin to diminish in size and function.

**Older adults: With age:**

Number of functioning nephrons decreases impairing kidney's filtering abilities.

Renal blood flow decreases due to decrease in cardiac output.

Urine concentrate-ability declines and diminished bladder muscle

# Factors affecting Urination

**2- Psychological Factors.**

A set of conditions helps stimulate micturition reflex include :

- Privacy,
- Normal position,
- Sufficient time,
- Running water.

**3- Medications.**

- Some medications affecting autonomic nervous system, interfere with normal urination process and cause retention.
- Diuretics increase urine formation and urine volume

# Factors affecting Urination

**4- Fluid and Food Intake.**

- When amount of fluid intake increases, output normally increases to maintain balance.

**Some Food and fluids:**

✓Increase urine output e.g. alcohol, coffee, tea, and cola, lettuce

✓High in sodium cause fluid retention to maintain normal concentrations of electrolytes

✓Can change color of urine e.g. blackberries cause urine to appear red.

**5- Surgical and Diagnostic Procedures.**

✓Cystoscopy cause  urethra swelling

✓Postoperative renal surgeries bleeding

✓Spinal anesthetics can affect the passage of urine

# Factors affecting Urination

**6- Muscle Tone and Activity.**

- Regular exercise enhances muscle tone, increased body metabolic rate and urine production.
- Presence of indwelling catheter lead to poor bladder muscle tone; the bladder does not fill and stretch.

**7- Pathologic Conditions.**

- Diseases of kidneys reduce its function and may result in renal failure.
- Urinary stones obstruct a ureter, blocking urine flow from the kidney to bladder.
- Some diseases and pathologic conditions

✓Increase urine formation e.g. diabetes insipidus.

✓Decrease urine formation e.g., atherosclerosis

# Renal Problems

**1- Conditions affecting children**:

a. Enuresis

b. Nocturnal enuresis or bed wetting

**2- Altered Urine Production**

a. 1-Polyuria

b. 2-Oliguria and Anuria.

**3- Altered Urinary Elimination**

a. Frequency and nocturia

b. Urgency.

c. Dysuria

d. Urinary incontinence.

e. Urinary retention.

f. Neurogenic Bladder.

# Conditions Affecting Children: .

## 1. Enuresis:

The involuntary passing of urine when control should be established

## 2. Nocturnal enuresis or bed wetting

The involuntary passing of urine during a sleep.

# Altered Urine Production

**a. Polyuria**.

A production of abnormally large amounts of urine

➢**Diuresis:**

Is production and excretion of large amounts of urine caused by medications to promote urine output (diuretics)

**b. Oliguria:**

Voiding scant amounts of urine, usually less than 500 ml in 24 hours or less than 30 ml/ hour.

**c. Anuria**

Is lack of urine production, with no effective urinary output. Urine output is less than 100 ml a day.

# Altered Urinary Elimination

**A. Frequency**

✓Voiding at frequent intervals more often than usual.

✓Total fluid intake and output may be within normal.

**Nocturia or nycturia.**

✓Voiding two or more times at night that is not a result of an increase in fluid intake.

**B. Urgency**.

✓It is the feeling that the person must void immediately. There may or may not a great deal of urine in bladder

**C. Dysuria**.

✓Voiding that is either painful or difficult.

❖Urinary hesitancy : a delay or difficulty in initiating voiding is associated with dysuria

**D. Urinary Incontinence.**

✓Involuntary urination.

✓It is a symptom and not a disease.

**F. Neurogenic Bladder**.

✓There is impaired in neurologic function that can interfere with the normal mechanisms of urine elimination.

✓The client with this condition doesn't perceive bladder fullness and is unable to control the urinary sphincters.

# ●○● NURSING MANAGEMENT

## a- Assessment of Urinary Elimination

1- History

✓Voiding pattern

✓Appearance of the urine: color, clarity (clear, transparent, or cloudy), and odor

✓Problems with urination

✓Presence of an ostomy

2- Physical Assessment

✓Percussion of the kidneys to detect tenderness.

✓Palpation and percussion of bladder.

✓Assess skin color, texture, tissue turgor and presence of edema.

✓Skin inspected for irritation

✓Measuring Residual Urine : is urine remaining in bladder following voiding. It is normally present in the bladder or consists of only a few millimeters.

# Characteristics of Normal & Abnormal Urine

| Characteristic | Normal findings | Abnormal findings |
|---|---|---|
| Amount in 24 hours (adult) | 1200-1500 | Under 1200 ml<br>Over 1500 ml |
| Color | Straw, amber, transparent | Dark amber, cloudy, red or dark brown |
| Clarity | Clear liquid | Mucus plugs, viscid, thick |
| Odor | Faint aromatic | Offensive |
| Sterility | No microorganisms present | Microorganisms present |
| pH | 4.5-8 | Under 4.5<br>Over 8 |
| Specific gravity | 1.010-1.025 | Under 1.010<br>Over 1.025 |
| Glucose | Not present | Present |
| Ketone bodies (acetone) | Not present | Present |
| Blood | Not present | Occult Bright red |

# Diagnostic Tests

1- Blood levels such as blood urea nitrogen (BUN), creatinine.

2- Urine specimens:

a. Clean voided specimen (routine):

✓About 10 ml of urine is generally required.

✓Specimen must be free of fecal contamination

b. Mid-stream urine specimens (clean catch or culture).

✓Specimen is from contamination by microorganisms.

✓This specimen is collected into a sterile specimen container

c. Sterile urine specimen from closed drainage systems (Foleys catheter)

d. Timed urine specimen

✓It is collection of all urine produced and voided over a specific period of time, ranging from 1 to 2 hours to 24 hours. Timed specimens are refrigerated or contain a preservative to prevent bacterial growth or decomposition of urine components.

# Urine Testing

**1-Specific gravity:** a measure of urine concentration, or amount of solutes present in urine.

**2-PH** :measured acidity or alkalinity of urine

**3-Glucose:** presence of glucose diabetes mellitus, pregnancy

**4-Ketone:** a product of breakdown of fatty acids. Normally, no presence for ketones in urine (+DM)

**6-Protein** normally, no presence for protein in urine, +kidney disorders

**7-Occult blood.** Normal urine is free from blood. When blood is present, it be clearly visible or not visible (occult).

# Urine Testing

**8- IVP (Intravenous pyelography**) is used to evaluate urinary tract.

**9- CT (Computerized Tomography**):Painless, noninvasive x-ray. It produce a three dimensional image of the organ or structure.

**10- Renal ultrasonography**: noninvasive test that uses reflected sound waves to visualize the kidneys.

**11- Cystoscopy**: using a cystoscope to visualize the bladder, ureteral orifices, and urethra.

# ●○● NURSING MANAGEMENT

## b. Nursing Diagnosis

1- Altered urinary elimination

2- Stress incontinence

3- Reflex incontinence

4- Urge incontinence

5- Functional incontinence

6- Total incontinence

7- Urinary retention

# ●○● NURSING MANAGEMENT

## b. Nursing Diagnosis

1- Altered urinary elimination

2- Stress incontinence

3- Reflex incontinence

4- Urge incontinence

5- Functional incontinence

6- Total incontinence

7- Urinary retention

# ●○● NURSING MANAGEMENT

## c. Implementing

❖**Maintaining normal urinary elimination through:**

• Promoting fluid intake: according to client's condition.

• Maintaining normal voiding habits**.**

❖**For Bed-Confined Clients : Assisting with toileting**

• Offer  the bedpan.

❖**Urinary Catheterization**

• It is the introduction of a catheter through urethra into urinary bladder.

❖**Intake and Output Charting**

# Types of Urinary Catheterization

1) **Straight catheter**: : Inserted to drain the bladder and then immediately removed.

**Purposes** of straight catheter are to:

- ✓relieve discomfort due to bladder distension
- ✓assess residual urine.
- ✓obtain a urine specimen.
- ✓empty the bladder completely prior to surgery.

# Types of Urinary Catheterization

**2) Retention (indwelling) catheter:**

Is a double lumen catheter.

*The larger lumen drains urine from the bladder.

*A second, smaller lumen is used to inflate a balloon to hold catheter in bladder.

Foleys catheters usually are connected to a closed gravity drainage system of a catheter, drainage tubing and a collecting bag for the urine

**Purposes of indwelling catheter are:**

✓manage incontinence

✓provide for intermittent or continuous bladder drainage and irrigation.

✓prevent urine from contacting an incision after surgery.

✓facilitate accurate measurement of urinary output for critically ill clients

# Intake and Output Charting

- The measurement and recording of all fluid intake and output (I & O) during a 24 hour period provides important data about the client's fluid and electrolytes balance.
- Unit used to measure I and O is the millimeter (ml), or cubic centimeter (cc)

**Intake Routes Include:**

1- Intravenous fluids (type, additives, time started, amounts absorbed, amounts remaining per shift).

2- Oral fluids (Ice chips, water, milk, juice, soup water taken with medications…

3- Blood transfusions.

4- Intravenous medications those are prepared with solutions such as normal saline.

5- Foods that tend to become liquid at room temperature such as ice cream, custard, and gelatin.

6-Tube feedings and 30-60 ml water rinse at the end of feedings

7- Fluid used to irrigate urinary catheters, nasogastric tubes and intestinal tubes

# Output measure the following fluids:

1- Urinary output:

2- Vomitus and liquid feces

3- Tube drainage

4- Wound drainage and drainage fistula:

# Fluid I & O Measurements

- Fluid I & O measurements are calculated at the end of each shift, and the totals are recorded in the client's permanent record.
- Staff on night shift totals the amounts of I& O recorded for each shift and records the 24 hours total.
- To determine whether fluid output is proportional to fluid intake or whether there are any changes in the client's fluid status the nurse:

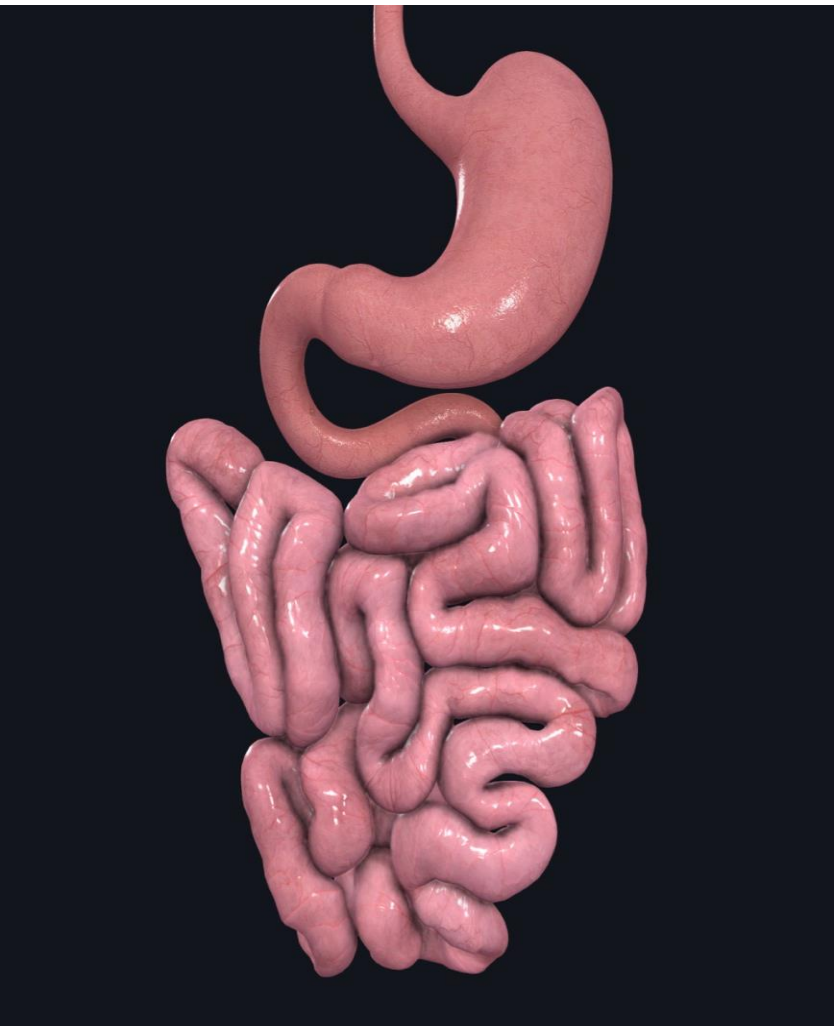
a) compares the total 24 hours fluid output measurement with total fluid intake measurement;

b) compares both to previous measurement if output exceeds intake, there is a risk for fluid volume deficit.

# Use of Toilet

- If the client is able to go to toilet, he/she can go without assistance.
- Clients who are a weakened by a disease process or impaired physically require assistance to toilet.
- The nurse should assist these clients to bathroom and remain with them if client is at risk for falling.
- Bathroom should contain an easily accessible call signal if help needed.
- Clients need to be encouraged to use handrails placed near toilet
- Clients unable to use bathroom facilities, the nurse provides urinary equipment close to the bedside (urinal and bedpan) and provides the necessary assistance to use them.

# Fecal Elimination



- Factors affect defecation
- Fecal elimination problems
- Bowel diversion ostomies
- Nursing management

# Physiology of Fecal Elimination(Defecation)

- Elimination (Bowel Movement) of waste products of digestion from body is essential to health.
- Waste products of digestion passes through large intestine, rectum and anal canal.
- Feces or Stool : are excreted waste products.
- Frequency of defecation is highly individual, varying from several times per day to two or three times per week.
- Amount defecated varies from one individual to another.

# Factors that affect Defecation

**1- Age and Development.**

- Infants: intestine is immature, water is not well absorbed, stool is soft, liquid and frequent. After intestine matures, stool becomes less frequent and firmer.
- Toddlers: Day time defecation control is attained by the age 2 ½ after a process of bowel training.
- School age children and adolescents: Have similar bowel habits to adults.

✓Patterns of defecation vary in frequency, quantity and consistency.

- Older adults: constipation is a common problem

# Factors that affect Defecation

## 2- Diet.

-Low fiber diets create insufficient residue of waste products.

-Irregular eating can impair regular defecation.

-Diarrhea and Flatus producing foods e.g Spicy foods

-Excessive sugar can cause diarrhea.

-Gas producing foods, e.g. cabbage, onions, cauliflower, bananas,

-Laxative-producing foods, e.g. figs, chocolate, and alcohol  Prune

-Constipation-producing foods e.g. cheese, pasta, eggs, meat.

## 3- Fluid.

- Inadequate fluid intake  or excessive output is e.g. urine or vomitus body continues to reabsorb fluid from **chyme** (the pulpy acidic fluid which passes from the stomach to the small intestine, consisting of gastric juices and partly digested food) as it passes along the colon.
- Chyme becomes drier than normal, resulting in hard feces.
- Healthy fecal elimination usually requires a daily fluid intake of 2000-3000 ml.

# Factors that affect Defecation

## 4- Activity.

✓Activity stimulates peristalsis, facilitating movement of chyme along colon.

✓Clients confined to bed are often constipated.

## 5- Psychologic Factors.

✓Anxious or angry people experience diarrhea.

✓Depressed people experience constipation.

## 6-Defecation Habits or Life-Style.

✓Early bowel training establish habit of defecating at a regular time.

✓When habitually ignored, urge to defecate is ultimately lost..

## 7- Medications.

✓Some drugs have side effects that can causes diarrhea e.g. Laxatives, others

✓cause constipation morphine and codeine, Iron

# Factors that affect Defecation

## 8-Diagnostic Procedures.

-Before certain diagnostic procedures e.g. sigmoidoscopy client is allowed no food or fluid after midnight preceding examination.

-Often client is given a cleansing enema prior to examination.

-The client will not usually defecate normally until eating has been resumed.

-Barium (used in radiological exams) presents a further problem. It hardens if allowed to remain in the colon, producing constipation.

## 9-Anesthesia and Surgery.

-General anesthetics cause the normal colonic movements to cease or slow down by blocking parasympathetic stimulation to muscles of colon.

-Intestinal Surgery cause temporary cessation of intestinal movements.

# Factors that affect Defecation

**10- Pathologic Conditions**.

- Spinal cord and head injuries can decrease sensory stimulation for defecation.
- Impaired mobility limits client may experience constipation or fecal incontinence because of poorly functioning anal sphincter..

**11- Pain**.

- Clients who experience discomfort when defecating often suppress the urge to defecate to avoid the pain and can experience constipation as a result.

# Fecal Elimination Problems

**A- Constipation**.

-A decrease in frequency and/ or passage of hard, dry stools.

-Or decrease bowel movements to less than three times per week.

**Causes Constipation**

1) Inadequate fiber intake;
2) Insufficient fluid intake;
3) Insufficient activity or immobility;
4) Irregular defecation habits;
5) Change in daily routine;
6) Lack of privacy;
7) Overuse and prolonged use of laxatives or enemas;
8) Emotional disturbances such as depression
9) Medications e.g. opiates (morphine) or iron salts..

# Fecal Elimination Problems

**B- Diarrhea.**

- Frequent passage of loose, fluid, unformed stools.
- Severe diarrhea is the potential for fluid and electrolyte loss.
- Causes Diarrhea

1) Allergy to food, fluid, drugs;
2) Intolerance of food or fluid;
3) Diseases of colon (mal-absorption syndrome Crohn's disease)
4) Psychological stress and anxiety;
5) Medications: antibiotics, iron
6) Surgical operations.

# Fecal Elimination Problems

**C- Bowel Incontinence or Fecal Incontinence.**

- Involuntary passage of stool.
- It is associated with impaired functioning of the anal sphincter or its nerve supply, e.g. in neuromuscular diseases, spinal cord trauma, and tumors
- It is an emotionally distressing problem that can lead to social isolation.

**E- Flatulence.**

It is not a problem but it causes embarrassing to the client.

There are many causes for flatulence such as

1) Action of bacteria on chyme in large intestine;
2) Gas diffuses from blood stream into intestine;
3) Swallowed air;
4) Eating gas-producing foods.

# BOWEL DIVERSION OSTOMIES

An ostomy is an opening for the gastrointestinal, urinary onto the skin.

**Types of intestinal ostomies.**

- A gastrostomy is an opening through the abdominal wall into the stomach.
- A jejunostomy opens through the abdominal wall into the jejunum,
- An ileostomy opens into the ileum (small bowel),
- A colostomy opens into the colon (large bowel).
- Gastrostomies and jejunostomies are generally performed to provide an alternate feeding route.

# BOWEL DIVERSION OSTOMIES

The purpose of bowel ostomies is to divert and drain fecal material.

Classification of Bowel diversion ostomies are according to:

(a) their status as permanent or temporary,

(b) their anatomic location,

(c) construction of the stoma, the opening created in the abdominal wall by the ostomy.

- A stoma is generally red in color and moist.
- Initially, slight bleeding occur when stoma is touched and this is considered normal.
- A person does not feel the stoma because there are no nerve endings in the stoma.

# ●○● NURSING MANAGEMENT
# Assessment of Bowel Elimination

**1- History**

-Defecation pattern (frequency and time of day of defecation

-Description of feces (stool color, texture (hard, soft, watery), shape, odor

-Fecal elimination problems:

-Methods used to remedy the problem and its effectiveness.

-Presence and management of ostomy

-Factors influencing elimination: diet, fluid, exercise, medications, stress.

**2- Physical Examination.**

Abdomen Rectum and anus

**3-Inspecting the feces:**

Color, consistency, shape, amount, odor.

# Normal Characteristics of Stool

| Character | Description |
| --- | --- |
| -Constituents | Adults: brown; Infant: yellow |
| -Consistency | Formed, soft, semisolid, moist |
| -Shape | Cylindrical about 2.5 cm in diameter |
| -Amount | Varies with diet (100-400 gm/ day) |
| -Odor | Aromatic: affected by ingested food and person’s own bacterial flora |

# Normal Characteristics of Stool

| Character | Description |
| --- | --- |
| Constituents | No pus, no mucus, no blood, no parasites, no foreign objects.<br>Small amount of undigested roughage, sloughed dead bacteria and epithelial cells, fat, protein, inorganic matter (calcium, phosphates) |

# Diagnostic studies.

1. Anoscopy:  direct visualization of anal canal
2. Proctoscopy:  direct visualization to the rectum
3. Proctosigmoidoscopy:  direct visualization to rectum and sigmoid colon
4. Colonscopy: direct visualization to large intestine
5. X-rays of the gastrointestinal tract to detect tumors, strictures (abnormal narrowing of a canal or duct in the body.), obstructions, ulcers
6. Barium meal: visualization of the tract by using barium. the chemical element of atomic number 56, a soft white reactive metal of the alkaline earth group.

# Laboratory Tests

**Stool specimens and collection.**

-Amount of stool depends on purpose specimen collection

-Usually about 2.5 cm of formed stool or 15-30 ml of liquid stool is adequate.

-Stool is tested for mucous, pus, and occult blood

-For stool culture, a sterile swap using sterile technique, places the swap in a sterile test tube.

-Don’t contaminate specimen by urine

-Send the specimen immediately to laboratory.

# ●○● NURSING MANAGEMENT

## Nursing Diagnosis

- Risk for constipation
- Risk for fluid volume deficit related to prolonged diarrhea or abnormal fluid loss through ostomy
- Risk for impaired skin integrity related to prolonged diarrhea, bowel incontinence.

# ●○● NURSING MANAGEMENT

# Intervention

**Promoting regular defecation by:**

**1- Privacy** during defecation is important

**2- Timing** a client should be defecate when urge to defecate is recognized.

**3- Nutrition and fluids**.

**a. For constipated client :**

1) Increase daily fluid intake 2000-3000 ml/day;
2) Instruct client to drink hot liquids and fruit juices
3) Encourage high-fiber foods : prunes, raw fruit, bran نخالةproducts

# Intervention

**b. For the client who has diarrhea**

1) Encourage oral intake of fluids and food;

2) Eating small amounts foods;

3) Encourage high potassium foods;

4) Avoid excessively hot or cold fluids

5) Avoid highly spiced foods and fiber foods.

**c. For the client who has flatulence**:

1) Limit carbonated beverages, the use of drinking straws, and chewing gum

2) Avoid gas-forming foods, such as cabbage, beans, onions, and cauliflower.

# Rectal Tube

- Used to treat flatulence and used in large volume enema.
- There are different sizes of rectal tubes.

# Enema

- It is a solution introduced into large intestine, to distend intestine and irritate intestinal mucosa, thereby increasing peristalsis and excretion of feces and flatus.
- Types of Enema

1- Cleansing : Are intended to remove feces.

2- Carminative. It is given to expel flatus.

3- Oil Retention: soften feces & lubricate rectum, to facilitate passage of feces.

4- Return-flow. It is used to expel flatus.

5-Antibiotic Enemas: Used to treat infections locally.

6-Antihelmintic enemas: kill helminthes الديدان الطفيلية worms, intestinal parasites.

7-Nutritive enemas: Used to administer fluids and nutrients to the rectum.

# The client's position

during administering enema is:

left lateral with right leg as acutely flexed as position to facilitate the flow of solution by gravity into the sigmoid and descending colon.