Addis Ababa Campus
Community Health Faculty
Department of Nursing
Year II
Summarized hand out for the course of Fundamental of Nursing II
By Dawit
Unit 1 Elimination

a) urine elimination

Over view Urinary System

In humans, the kidneys are located in the abdominal cavity, in a space called the retro peritoneum.**(The retroperitoneal space (retroperitoneum) is the anatomical space in the abdominal cavity)** There are two, one on each side of the spine. The asymmetry within the abdominal cavity caused by the liver typically results in the right kidney being slightly lower than the left, and left kidney being located slightly more medial than the right.

Kidney and urinary system parts and their functions

Two kidneys - a pair of purplish-brown organs located below the ribs toward the middle of the back. Their function is to remove liquid waste from the blood in the form of urine; keep a stable balance of salts and other substances in the blood; and produce erythropoietin, a hormone that aids the formation of red blood cells.

The kidneys remove urea from the blood through tiny filtering units called nephrons. Each nephron consists of a ball formed of small blood capillaries, called a glomerulus, and a small tube called a renal tubule. Urea, together with water and other waste substances, forms the urine as it passes through the nephrons and down the renal tubules of the kidney.

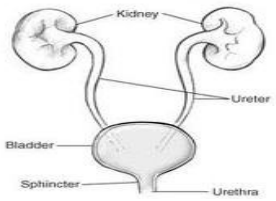
Two ureters - narrow tubes that carry urine from the kidneys to the bladder. Muscles in the ureter walls continually tighten and relax forcing urine downward, away from the kidneys. If urine backs up, or is allowed to stand still, a kidney infection can develop. About every 10 to 15 seconds, small amounts of urine are emptied into the bladder from the ureters.

Bladder - a triangle-shaped, hollow organ located in the lower abdomen. It is held in place by ligaments that are attached to other organs and the pelvic bones. The bladder's walls relax and expand to store urine, and contract and flatten to empty urine through the urethra. The typical healthy adult bladder can store up to two cups of urine for two to five hours.

Two sphincter muscles - circular muscles that help keep urine from leaking by closing tightly like a rubber band around the opening of the bladder.

Nerves in the bladder - alert a person when it is time to urinate, or empty the bladder.

Urethra - the tube that allows urine to pass outside the body. The brain signals the bladder muscles to tighten, which squeezes urine out of the bladder. At the same time, the brain signals the sphincter muscles to relax to let urine exit the bladder through the urethra. When all the signals occur in the correct order, normal urination occurs.



How do the kidneys and urinary system work?

The body takes nutrients from food and converts them to energy. After the body has taken the food that it needs, waste products are left behind in the bowel and in the blood.

The kidney and urinary systems keep chemicals, such as potassium and sodium, and water in balance and remove a type of waste, called urea, from the blood. Urea is produced when foods containing protein, such as meat, poultry, and certain vegetables, are broken down in the body. Urea is carried in the bloodstream to the kidneys. Other important functions of the kidneys include blood pressure regulation and the production of erythropoietin, which controls red blood cell production in the bone marrow.

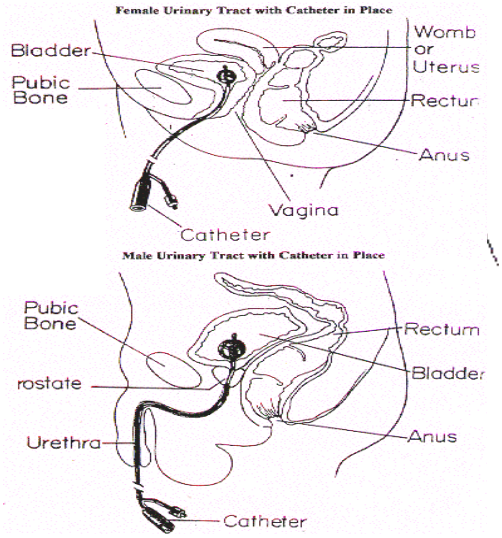
Facts about urine:

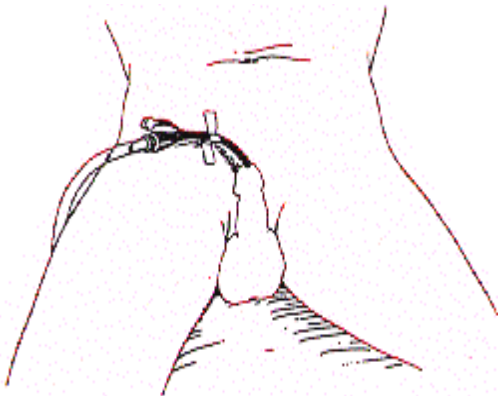
- Adults pass about a quart and a half of urine each day, depending on the fluids and foods consumed.
- The volume of urine formed at night is about half that formed in the daytime.
- Normal urine is sterile. It contains fluids, salts and waste products, but it is free of bacteria, viruses and fungi.
- The tissues of the bladder are isolated from urine and toxic substances by a coating that discourages bacteria from attaching and growing on the bladder wall.

Catheterization

Urinary catheterization is the introduction of a catheter through the urethra in to the urinary bladder. This is usually performed only when absolutely necessary, because the danger exists of introducing microorganisms in to the bladder, thus strict sterile techniques are used for catheterization. Another hazard is trauma, particularly in the male client whose urethra is longer & more tortuous. It is important to insert a catheter is farced through the strictures or at an incorrect angle. In males, the urethra is

normally curved, but it can be straightened by elevating the penis to a position perpendicular to the body.





Catheter types

1. A Foley catheter (Indwelling catheter)

Is retained by means of a balloon at the tip which is inflated with sterile water. The balloons typically come in two different sizes: 5 cc and 30 cc. They are commonly made in silicone rubber or natural rubber. An indwelling catheter is a tube which is inserted into the bladder and left in place in drain urine. There are a number of reasons to use an indwelling catheter, ranging from a desire to measure urine output after surgery to an incontinence management plan. The key difference between an indwelling catheter and other types of urinary catheters is that the catheter is intended to be left in place, rather than being Use a retention (folly) catheter for longer time and ***used once to drain urine and then removed.***

A Robinson catheter

Is a flexible catheter used for short term drainage of urine? Unlike the Foley catheter, it has no balloon on its tip and therefore cannot stay in place unaided.

NB:
Some health professional may choose to use another type catheter called a suprapubic catheter, which is inserted directly through the abdominal wall.

Catheter diameters

Catheter diameters are sized by the **French catheter scale** (F).

- Determine appropriate catheter length by the clients' gender.For adult female, clients', use a 22cm catheter,for adult male client's, a 40CM catheter.
- Determine appropriate catheter size by the size of the urethral canla.
- Use sizes such as **# 14 or # 16 for adults. Men frequently require a larger size than women, for example, # 18**

Sex differences

In males, the catheter tube is inserted into the urinary tract through the penis. A condom or Texas catheter can also be used. In females, the catheter is inserted into the urethral meatus, after a cleansing using providing-iodine. The procedure can be complicated in females due to varying layouts of the genitalia (due to age, obesity, Female genital cutting, childbirth, or other factors), but a good clinician should rely on anatomical landmarks

Purpose

- To relieve discomfort due to bladder distention to provide gradual decompression of a distended bladder.
- To asses the amount of residual urine if the bladder empties incompletely.
- To obtain the urine specimen
- To empty bladder completely prior to surgery.
- To facilitate accurate measurement of urinary output for critically ill clients whose out put needs to be monitored hourly.
- To provide for intermittent or continuous bladder drainage and irrigation.
- To prevent urine from contacting an incision after perinea surgery.
- To manage incontinence when other measures have failed

Urinary bladder irrigation

Irrigation is flashing or washing out with a specified solution. Bladder irrigation is carried out on a physician o nurse practitioner's order.

Purpose

- To wash out the bladder and sometimes to apply a medication to the bladder lining.
- Irrigations may be performed to maintain or restore patency of a catheter. For example. To remove pus or blood clots blocking the catheter.

Assessment

Before irrigation a catheter or bladder, check

a) The reason for the irrigation
b) The order authorizing the continuous or inter mitten irrigation (in most agencies, a physician or nurse practitioner's order is required);
c) The type of sterile solution. The amount and strength to be used, the rate if continuous; and
d) The type of catheter in place if these are not specified on the client's chart, check agency protocol.

Enema Administration

Bulk:-a substance that absorbs water while in the intestinal tract. It helps to simulate peristalsis.

Hemiplegia: - paralysis of only one side of the body

Paraplegia: - paralysis of lower portion of the body & of both legs

Quadriplegia: - paralysis of all four extremities & usually the trunk.

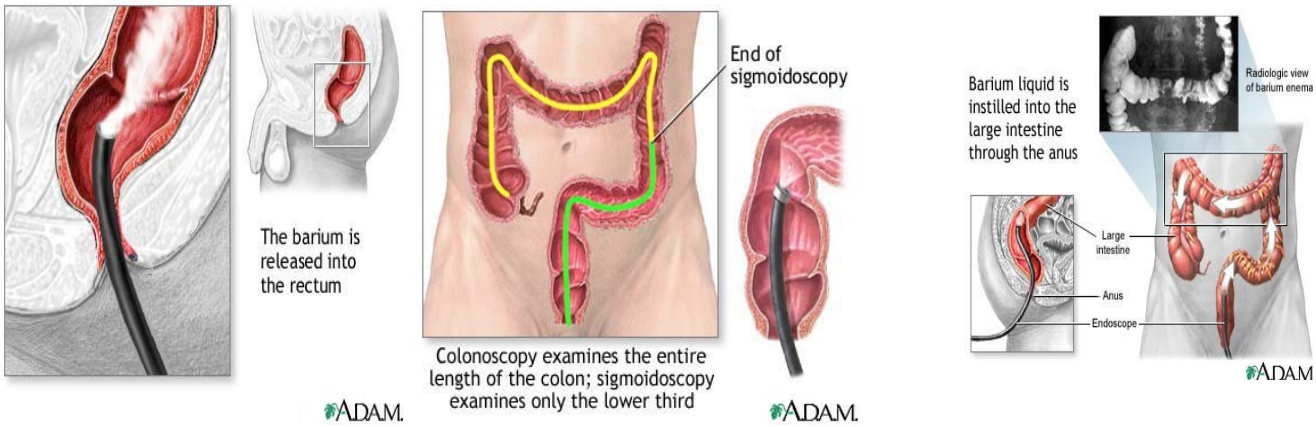
Fecal impaction: - the formation of a firm mass of faces in the distal colon or rectum. The size & firmness of the mass prevents its passage.

Laxative: - a food or chemical substance that acts to loosen the bowels i.e. facilitate passage of bowel contents at time of defecations, and therefore, to RX CONSTIPATION

Suppository: - a semisolid substance for introduction in to the rectum, vagina, or urethra, where it dissolve

Enema - The term enema is used to refer to the process of instilling fluid through the anal sphincter into the rectum and lower intestine for a therapeutic purpose. An enema administration is performed using a flexible plastic rectal tube with several large holes in the tip. This is connected to the tubing from a solution bag or container.

An enema can also be performed using a prepackaged solution that comes in a soft plastic bottle with a pre-lubricated rectal tip attached. **Enema** solutions are prepared using ***plain tap water or saline, soapsuds solutions, oil solutions, or various medication solutions.***



Purpose

The most common purpose for administering an enema is to stimulate peristalsis (involuntary contraction) and to evacuate stool from the rectum. A tap water or soapsuds enema dilates the bowel, stimulates peristalsis, and lubricates the stool to encourage a bowel movement. These types of enemas are instilled and held for five to 10 minutes, as tolerated.

They are used to treat constipation, to cleanse the bowel before a bowel exam, and to cleanse the bowel before bowel surgery. Another type of enema, the oil retention enema, is prepared in a smaller volume and is retained in the bowel for 30–60 minutes.

The purpose of the oil retention enema is to soften the hardened stool and allow normal elimination. Enemas are also used to deliver medication directly onto the rectal mucous

membranes to be absorbed into the bloodstream. Steroid enema solutions can be administered to alleviate bowel inflammation in patients with

ulcerative colitis. Antibiotic enema solutions can be administered to treat localized bacterial infections. Medicated hypertonic enema solutions can be used to pull excessive potassium or ammonia from the bloodstream through the rectal wall. These substances are then eliminated with the stool.

Types of enema:

- Cleansing enema
- Retention enema
- Carminative enema
- Medicated enema

CLEANSING ENEMA

Cleansing Enema_

It is washing out of the colon introducing & stimulating peristalsis by the action of irritation & distension of volume.

Purpose:

1. To stimulate peristalsis & remove feces or flatus
2. To soften feces & lubricate the rectum & colon
3. To clean the rectum & colon in preparation for an examination.
4. To remove feces prior to a surgical procedure or delivery.

Types of Cleansing Enema.

A. ***High enema***:- Given to clean as much of the colon as possible. About 1000 ml of solution used

B. ***Low enema:-*** is used to clean the rectum & the sigmoid colon only. About 500ml solution is administered.

Solution	Constituents	Action	Time to take effect	Adverse effect
Hypertonic	90 – 120ml of solution (Eg:- sodium phosphate)	- Draws water in to colon	**5 -10min**	- Retention of sodium
Hypotonic	500 – 1000ml of tap water	- Distend colon, stimulates peristalsis & soften feces	**15 -20 min**	- Fluid & electrolyte imbalance the H_20 in toxicities.
Isotonic	500 -1000ml of normal saline (9ml Nacl to 1000ml water)	- distends colon stimulates perystalsis &soften feces	**15 -20 min**	- Possible sodium retention
Soap suds	500 – 1000ml (3 -5ml soap to 1000ml water	- Irritates mucosa, distends colon	**10 – 15 min**	- Irritates & may damage mucosa

Types of Liquid Used For Cleansing Enema

1. ***Tap water***: Usually prepared in large quantity 500 to 1500ml
2. ***Mild soap solution***:- Can be made by dissolving a small amount of bland white soap in the water. Usually prepared in large quantity 500 to 1000 ml depending on the age & condition of the patient.
   The purpose of soap is to cause chemical irritation to the mucus membrane & stimulate peristalsis.
3. ***Normal Saline***: is a salt solution made up by mixing one tea spoon of salt a litter of water. Usually contains 1000cc of normal saline.

4. Epson salt :- 15 gm – 120 gm in 1000cc of water.

Amount of solution used

- Infants 250ml (one month to one year)
- Toddler 250 – 350ml (one year to three years)
- School age 300 -500ml (six years to eleven years)
- Adolescent 500 – 750ml (eleven to twenty-one years)
- Adult 750 – 1000ml

RETENTION ENEMA

Retention Enema: it is an introduction of oil or medication in to the rectum & sigmoid colon.

1. Retention enema are given slowly with small rectal catheter and funnel
2. Usually it is given for the purpose of retention & absorption.
3. the amount is usually 200 – 300 ml. For children 75 -150 ml.
4. Temperature usually 37^0c or at the level of body temperature.

Purpose:-

- To soften very hard dry feces
- To administer some drugs or medications

CARMINATIVE ENEMA

A carminative enema is given primarily to expel flatus. The solution instilled in to the rectum release gas which in turn distends the rectum and the colon, thus stimulating peristalsis. For an adult, 60 to 80 ml of fluid is instilled.

RECTAL WASH OUT (RETURN FLOW ENEMA)

It is repetitive instillation of fluid in to and drainage of fluid from the rectum. The inflow & out flow process is repeated 5-6 times until gas bubbles cease or abdominal distension & discomfort is relieved.

Total amount of 1000ml of solution 100 -200ml at a time.

Purpose:- -

To expel flatus and feces

To stimulate peristalsis

INSERTING FLATUS TUBE.

- Flatus tube is inserted to prevent or reduce flatulence

Purpose:- to relive abdominal distention before giving a retention enema

Complications

Complications of enema administration are not common but can include irritation, swelling, redness, bleeding, or prolapsed of the rectal tissue. If any of these symptoms are apparent, or if the patient complains of pain or burning during enema instillation, stop the procedure.