

Elimination Needs



Urinary Elimination

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Learning Objectives:

At the end of this lecture, the student will be able to:

- Define related terms: micturation, urine, Ployuria, Oliguria, Anuria, Urinary incontinence, Retention, Retention with overflow, Dysuria, Enuresis, Nocturia, Urgency, Residual urine.

- **Discuss the characteristics of normal urine.**
- **Differentiate between urinary problems.**
- **Identify abnormal findings of urine.**
- **Discuss the factors, which affect the individual's urinary elimination.**

- Discuss the nursing measures for patient with urinary incontinence.
- Discuss the nursing measures for patient suffering retention.

Outlines:

- **Anatomy and physiology of the urinary system.**
- **Characteristics of normal urine.**
- **Signs and symptoms of urinary problems.**

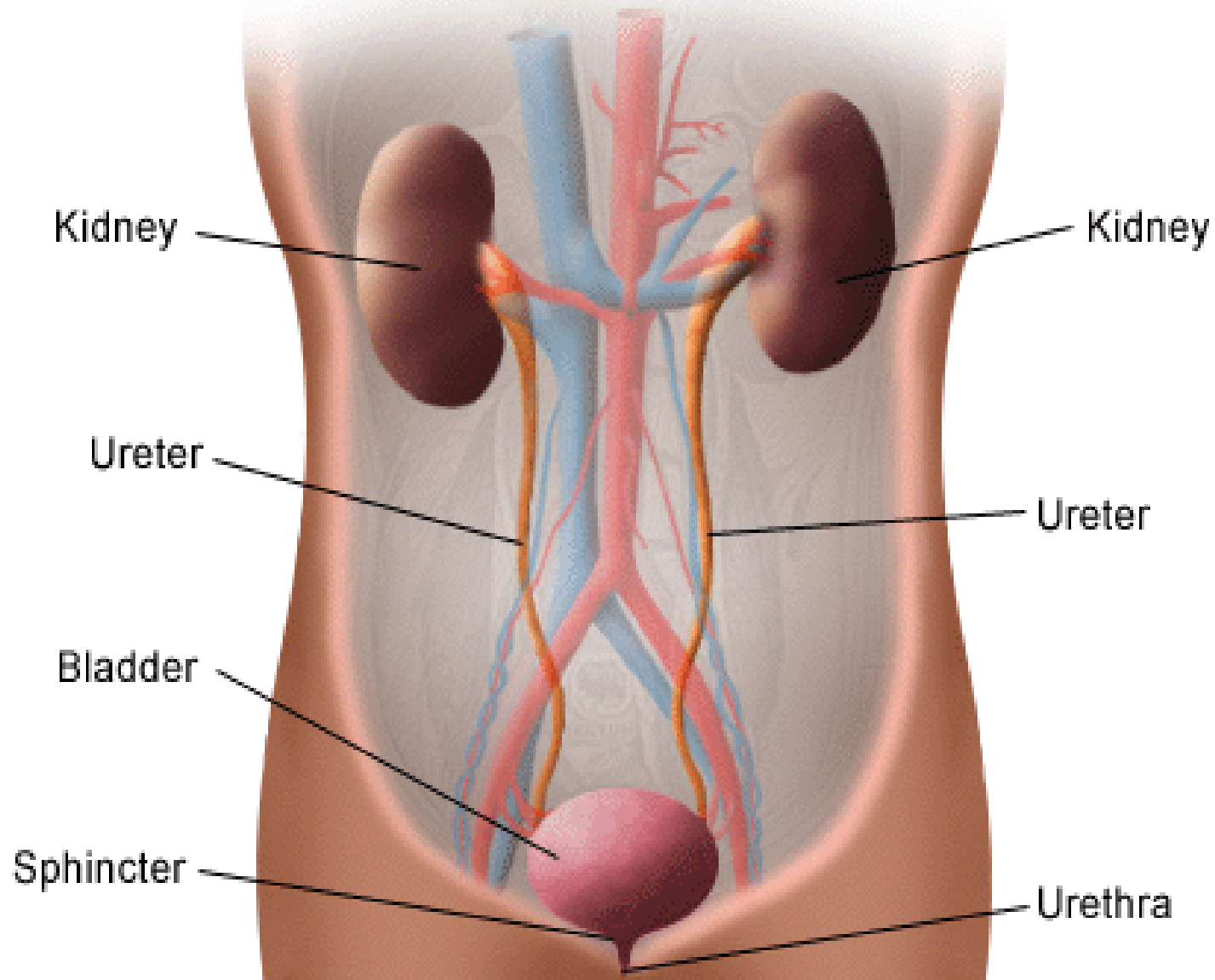
- **Abnormal findings of urine.**
- **Factors which affect the individual's urinary elimination.**
- **Nursing measures for patient with urinary incontinence.**

- **Nursing measures to promote proper urinary elimination for patients suffering from urinary retention.**
- **Urinary catheterization.**

Anatomy and physiology of the urinary system:

The urinary system is composed of 2 kidneys, 2 ureters, the bladder and the urethra.

Front View of Urinary Tract



The Kidneys:

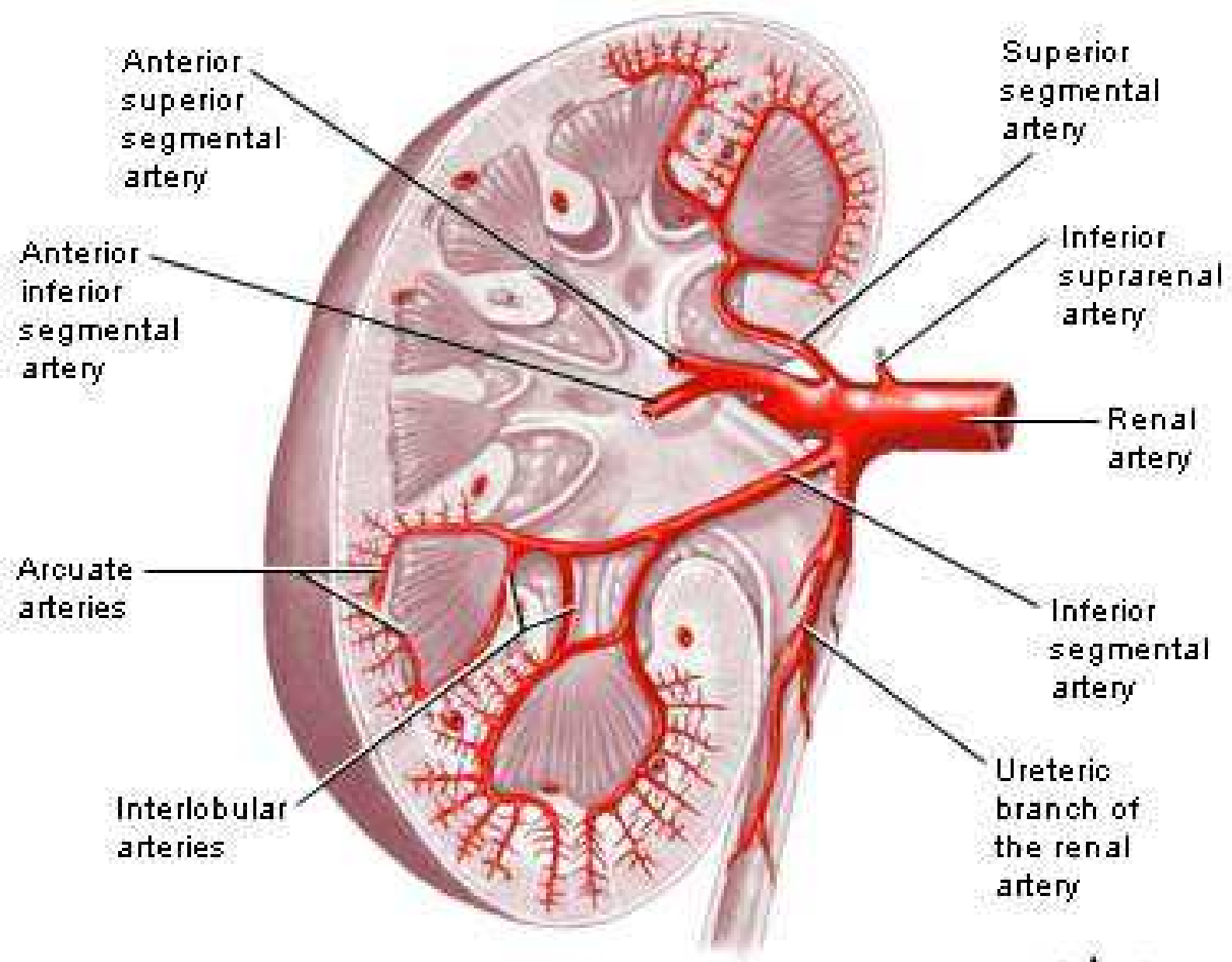
The right and left kidneys, they are complex organ whose chief function is the elimination of waste products of body metabolism and the control of concentration of the various constituents of the body fluid, including the blood.

Blood reaches the kidneys through the renal arteries and is filtered in the glomeration of the nephrons.

The nephrons are the functioning unit of the kidney.

It is estimated that each kidney has about one and half million nephrons.

The filtrate contains water, the waste products of metabolism, electrolytes and glucose. This filtrate is known as urine.



Anterior superior segmental artery

Superior segmental artery

Anterior inferior segmental artery

Inferior suprarenal artery

Renal artery

Arcuate arteries

Inferior segmental artery

Interlobular arteries

Ureteric branch of the renal artery

Kidney Functions:

- Excretion of metabolic wastes (urea, uric acid, creatinine and ammonia).
- Regulation of acid -base balance of the blood.
- Regulation of the amount of extracellular fluid through elimination of excess fluid or fluid retention.

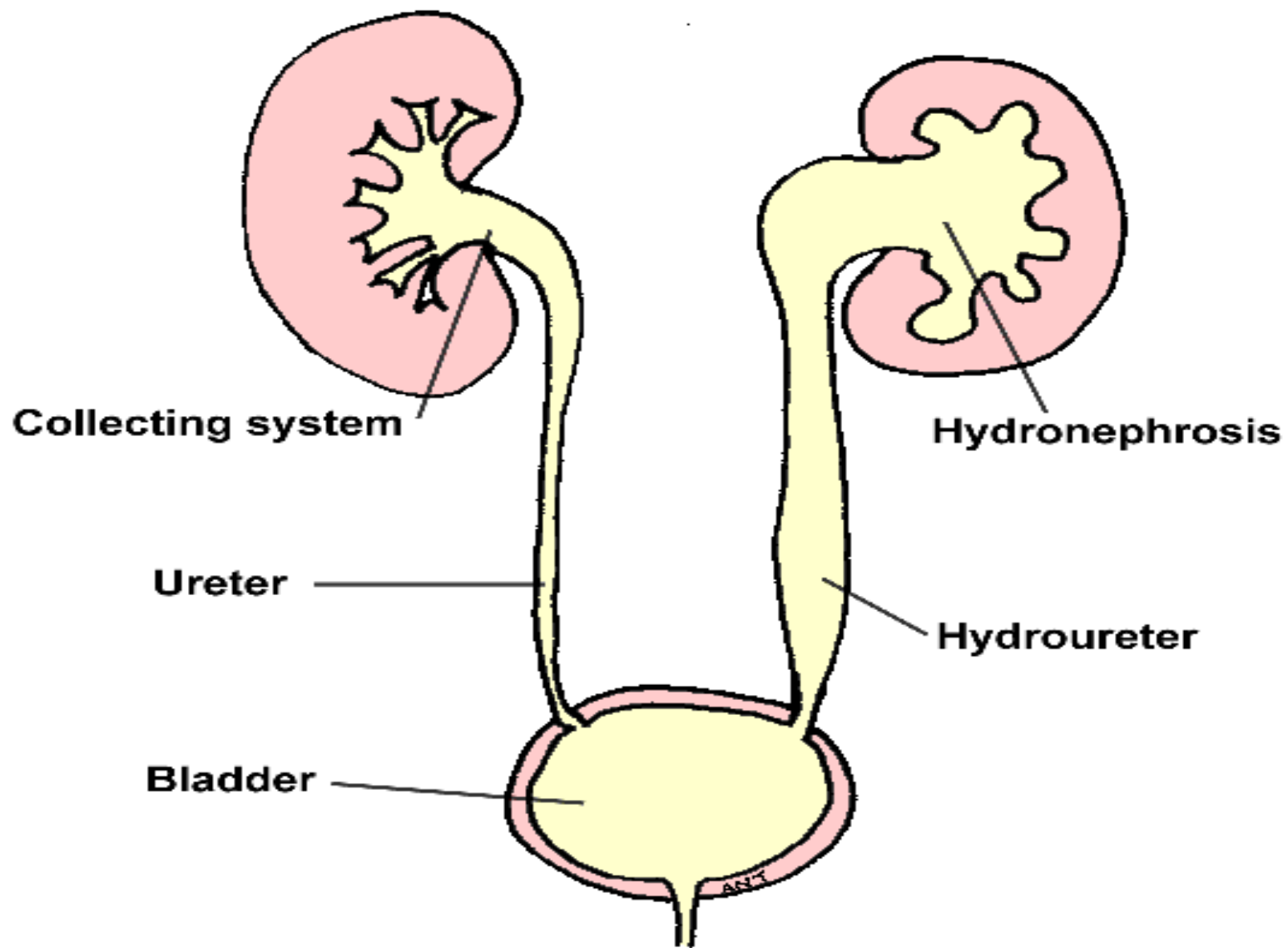
- Regulation of osmotic pressure of extracellular fluid by regulating the amount of sodium chloride and water.
- Regulation of extracellular electrolytes by either selective reabsorption of important electrolytes or excretion of excess such as glucose.

- Regulation of blood pressure : The kidney produces an enzyme like substance called renin that can raise blood pressure.
- Regulation of red blood cell production: Under stress, the kidney produces erythropoietin, which stimulates the production of red blood cells in bone marrow.
- Control of water excretion: The reassertion of water in the tubules is controlled by pituitary and hypothalamic action.

The Ureters:

Are 2 tubes, each one is connected to the pelvis of the kidney.

Its chief function is to convey the urine formed in the kidney pelvis to the bladder. It is about 25-30 cm long and it has a narrow diameter.

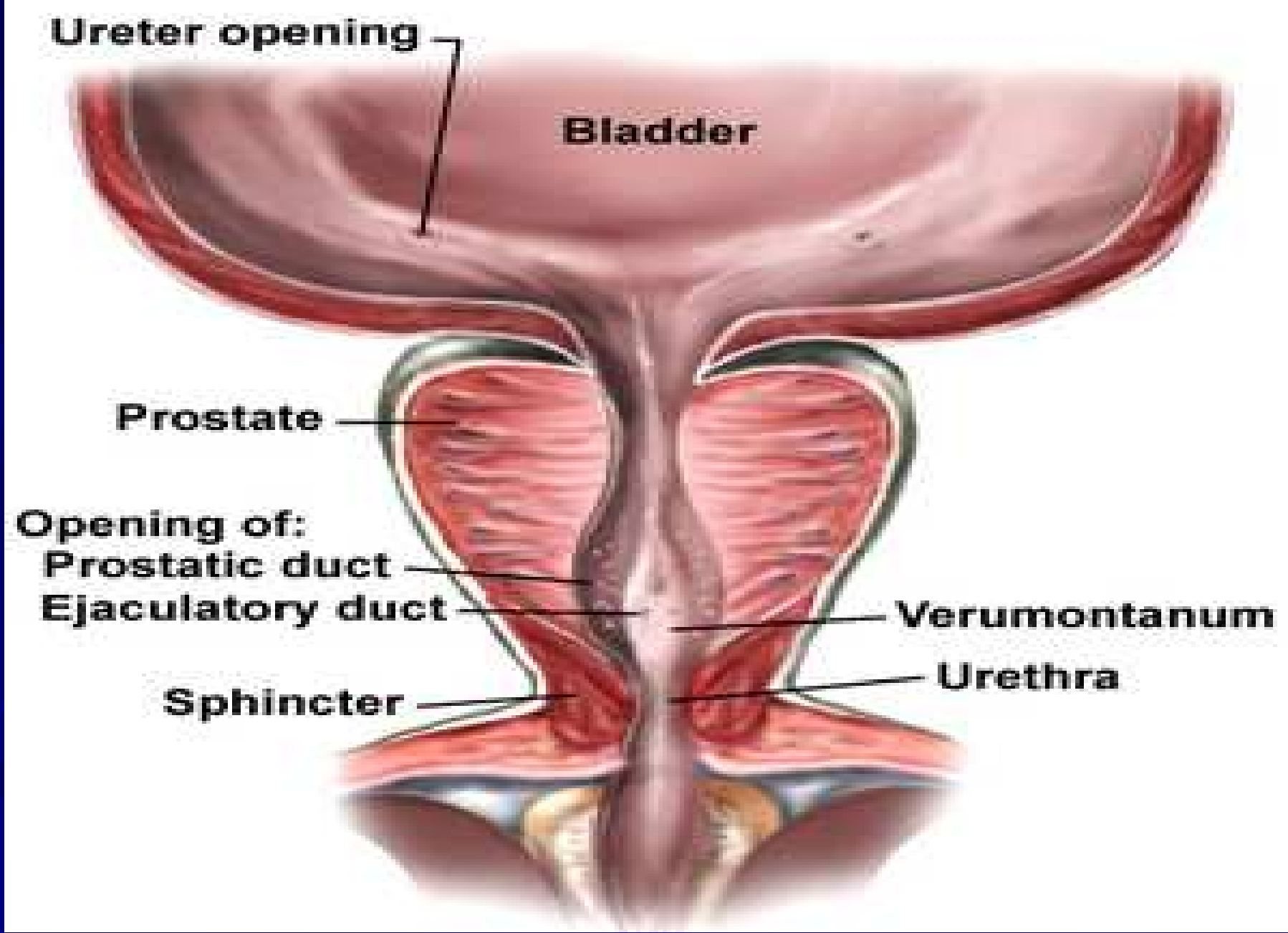


The Bladder:

Is a hollow, muscular organ that serves as a reservoir for urine.

The bladder can retain urine until it can be excreted.

The average adult bladder holds from 300 - 500 cc of urine.



Ureter opening

Bladder

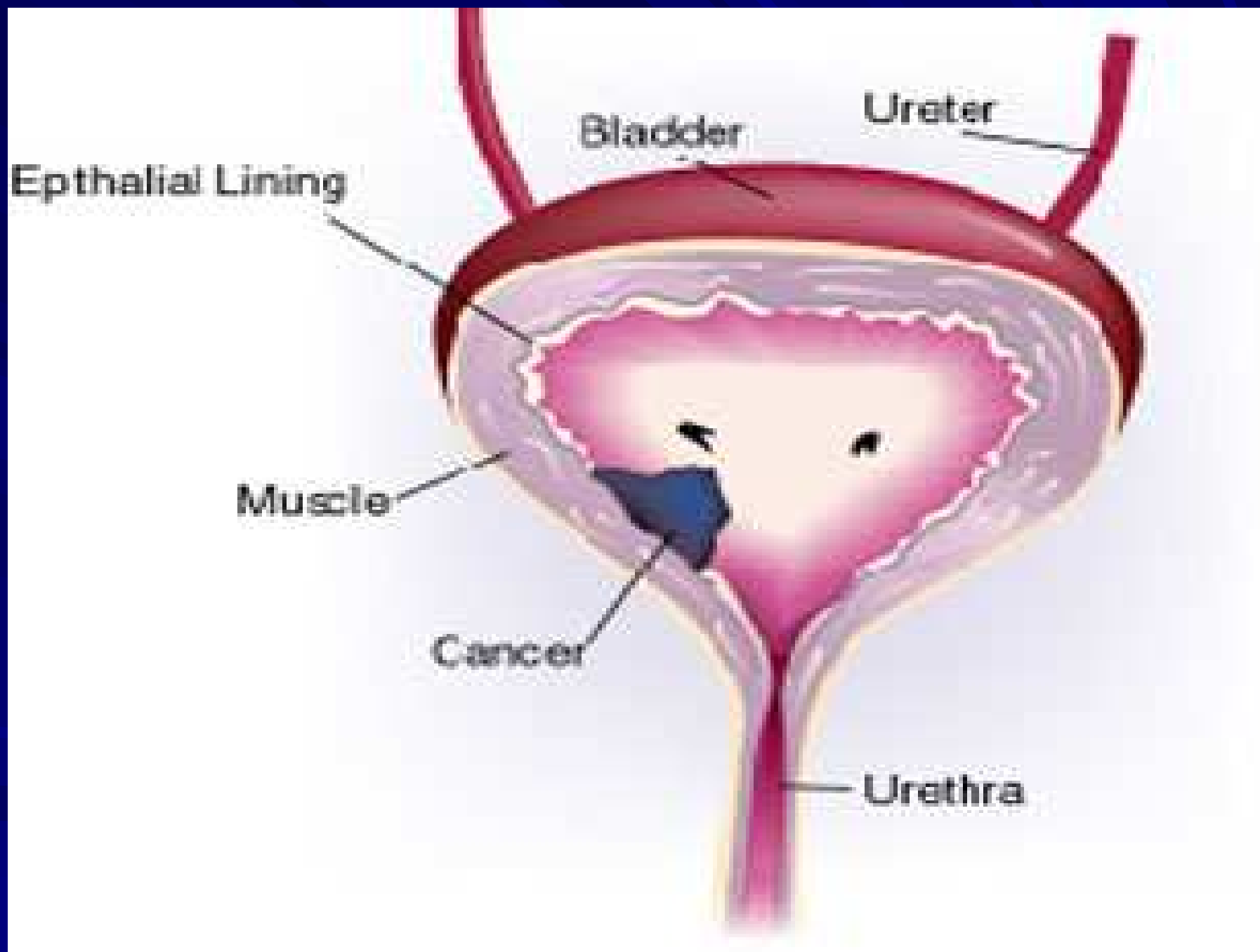
Prostate

**Opening of:
Prostatic duct
Ejaculatory duct**

Verumontanum

Sphincter

Urethra



This depends upon the efficient muscle tone of the bladder wall and upon the integrity of the nervous system enervating the bladder and the condition of the internal sphincter which' controls the passage of urine from the bladder to the urethra.

Stimulation of the bladder is transmitted by the sympathetic nervous system through the hypogastric nerves and by the parasympathetic nervous system through the pelvic nerves, i.e. the smooth muscle wall of the bladder has a double nerve supply.

The sympathetic nervous system relaxes the bladder wall to permit filling and it also contracts the internal sphincter to prevent urine escaping to the exterior.

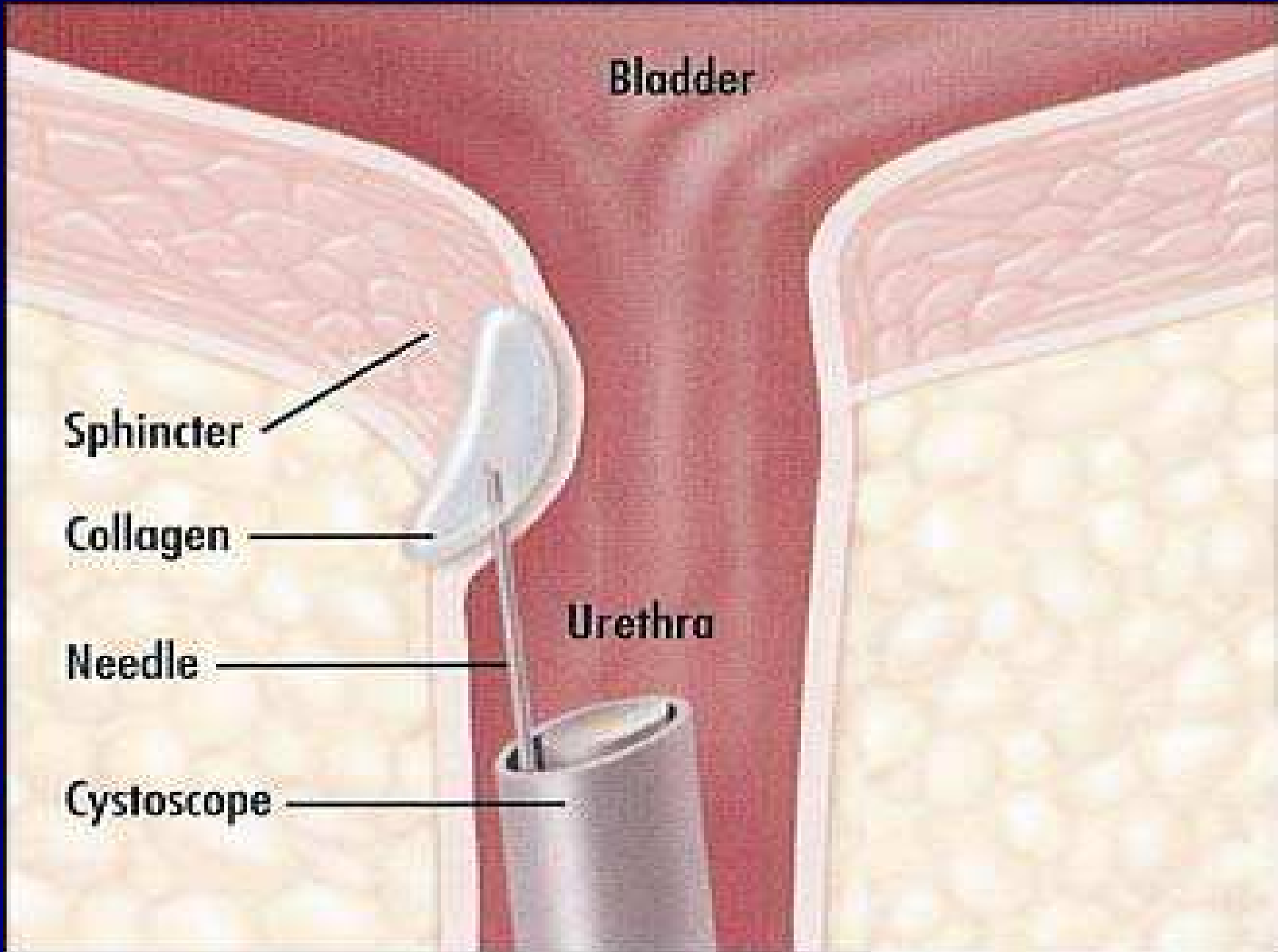
The external sphincter is under voluntary control so that urine can be held in until the toilet is reached and the person is ready to void.

The parasympathetic nervous system stimulates contraction of the bladder muscle to squeeze urine out, at the same time relaxing the internal sphincter to permit flow of urine along the urethra.

The Urethra:

Is a short, hollow muscular tube approximately 3.7 cm. long in the female and 20 cm. in the male; the chief function of the urethra is to provide a passage-way through which urine can be voided from the bladder.

The entire urinary tract is lined with mucous membrane.



Micturation or Voiding:

It is the act by which urine is expelled from the bladder. The acts of initiating and stopping maturation are normally under voluntary control via external sphincter muscle.

Urine:

Is the waste product of metabolism.

It is a complex aqueous solution of organic and inorganic substances.

Characteristics of Normal Urine:

Amount : 1200 - 1800 cc/24 h.

Colour : Clear, straw, amber yellow.

Transparency : Transparent.

Reaction: Slightly Acidic ph 4.5 - 6.

Odor: Aromatic odor.

Specific gravity: 1.005 -1.030

Constituents: Urine contains creatinine, uric acid, urea and a few white blood cells.

Frequency of Voiding:

The frequency of voiding varies with the bladder capacity, sensation, acceptability and availability of toilet facilities.

Voiding 5-10 times a day is common.

Signs and Symptoms of Urinary Problem:

- 1. Polyuria:** voiding a large amount of urine.
- 2. Oliguria:** Voiding a scanty amount of urine. (Less than 600 cc/day)
- 3. Anuria:** or urinary suppression: Total absence or marked deficiency i.e. absence of urine emerged from the kidneys.
- 4. Urinary incontinence:** Involuntary voiding or constant dribbling of urine.

Types of urinary incontinence:

- **A constant incontinence.**
- **Occasional incontinence.**
- **Stress incontinence.**
- **Overflow incontinence.**

5. Retention:

- Retention: The urine is formed in the kidneys, but the patient is unable to excrete it from his urinary bladder. Retention is recognized by palpating the distended bladder above the symphysis pubis as the urine is stagnated in. it.
- Retention with over flow: the patients void small amounts of urine frequently but continue to have distended bladder.

- 6. *Dysuria:*** Difficulty in voiding or pain in voiding.
- 7. *Nocturia:*** It is the need to get up from sleep in order to void.
- 8. *Enuresis:*** It is involuntary loss of urine at night (bed wetting). It persists in some children as late as 10 years old or more.
- 9. *Urgency:*** Is the sensation that one must void.
- 10. *Residual urine:*** When a bladder empties normally, it retains little amount of urine.



Abnormal Findings of Urine:

- ***Hematuria:*** Presence of blood in the urine.
- ***Pyuria:*** Presence of pus in the urine.
- ***Albuminuria:*** Presence of albumin in the urine.

- ***Pale urine:*** Means diluted urine may be due to excessive fluid intake or intake of diuretics.
- ***Glycosuria:*** Presence of sugar in the urine.
- ***Casts:*** Presence of coagulated protein from the kidney tubule.

- **Dark urine: Means urine is concentrated, may be due to:**
 - **Dehydration, or low fluid intake,**
 - **Presence of bile pigments (urobilin or bilirubin) due to disease of the liver or gall bladder.**
 - **Intake of certain drugs such as antibiotics turns the colour of urine into orange or red.**
 - **Intake of certain food, vegetables and fruits such as carrots, beetroot and blackberries.**
 - **Presence of blood.**

Factors which affect the individual's urinary elimination:

- **Change in the patient's environment:** Such as improper toilet facilities, unclean toilets or lack of privacy. The hospital routine might affect patient's habits.
- **Amount of fluid intake:** It can either increase or decrease amount of urine.

- ***Intake of drugs:*** Might lead to change color of urine, or can increase urinary output (diuretics).
- ***Psychological factors:*** Such as stress, fear, anxiety and emotional factors.
- ***Pathologic conditions:*** Such as fever, diabetes, infection of the urinary tract.

- Disease of the nervous system or injuries which might lead to urinary incontinence.
- ***Physical activities:*** Such as immobility.
- ***Blood pressure:*** Low blood pressure (Hemorrhage) lead to low production of urine.

- ***Obstruction:*** Will cause stasis of urine. Obstruction may be due to congenital defect, calculi, tumor, etc.
- ***Hormonal influences:*** Anti diuretic hormone secreted by the posterior lobe of pituitary gland and suppresses the amount of urine produced.

Nursing measures for patient with urinary incontinence:

- Skin care to prevent irritation and breakdown.
- Cleanliness of linen and clothes.
- Frequent turning of patient to prevent decubitus ulcer.
- Perineal and abdominal exercises.

- **Strengthening the abdominal muscle by using it to aid air inhalation, Tightening and relaxing the perineal muscles 10 times (3 times daily).**
- **Bladder retraining programs.**
- **Adjusting the fluid intake schedule.**
- **Emotional support.**

Measures to promote proper urinary elimination for patients Suffering from urinary retention:

- Restrict fluid intake because urine is accumulated in the urinary bladder be aware of fluid intake of patient during the first 24 hours.
- Provide privacy to the patient by using curtains or closed doors.

- Help the patient to assume a sitting position to help him void.
- Provide a bedside commode if the patient cannot use the bedpan or urinal.
- Listening to the sound of running water, will help the patient to void.
- Pour warm water over the perineum of the female patient, or help the patient to sit in a warm bath tub.

- **Provide a warm bedpan or urinal.**
- **Supply a warm hot water bottle to the patient or lower abdomen.**
- **Put the patient hands in warm water.**
- **Catheterization: Should be ordered by the physician if the pervious Measures are not successful.**

Urinary Catheterization:

Urinary catheterization consists of inserting a thin hollow tub through the urethra into the bladder to remove urine from the bladder or to establish a patient urine drainage method.



Thank You