London School of Massage

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Genito-Urinary System

At the end of this section you will understand and appreciate:

- Structure and function of the reproductive system
- Structure and function of breast tissue
- Structure and function of the urinary system
- Production of urine
- Conditions affecting the genito-urinary system
- How massage affects the genito-urinary system

Web: LondonSchoolofMassage.co.uk
Email: info@londonschoolofmassage.co.uk
Tel: 020 7700 3777

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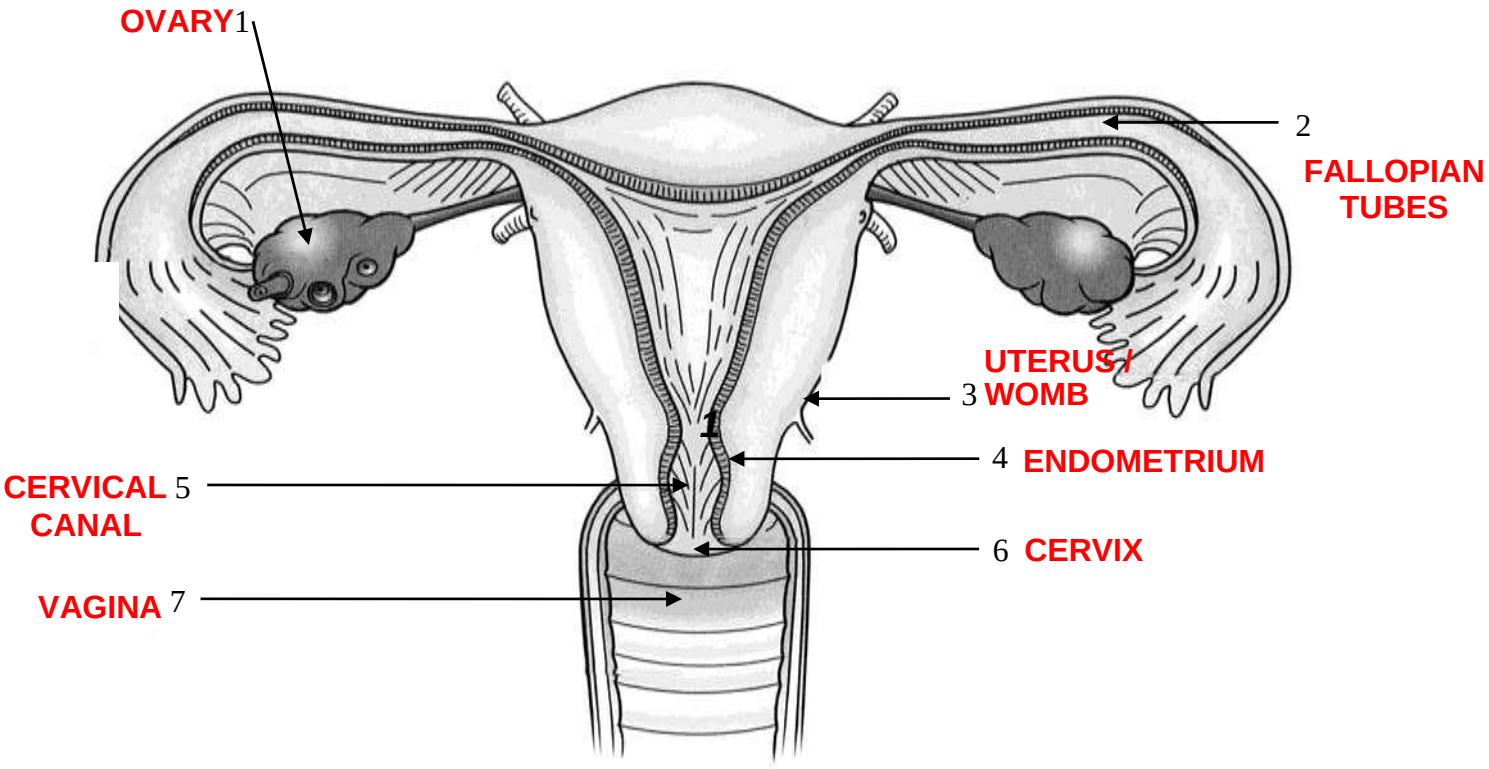
The Reproductive System

The Genito-urinary system consists of the systems, which deal with reproduction and that which deals with excretion of waste as urine.

THE REPRODUCTIVE SYSTEM

This system deals with reproduction, which is essential for the continuation of a species.

THE FEMALE REPRODUCTIVE SYSTEM



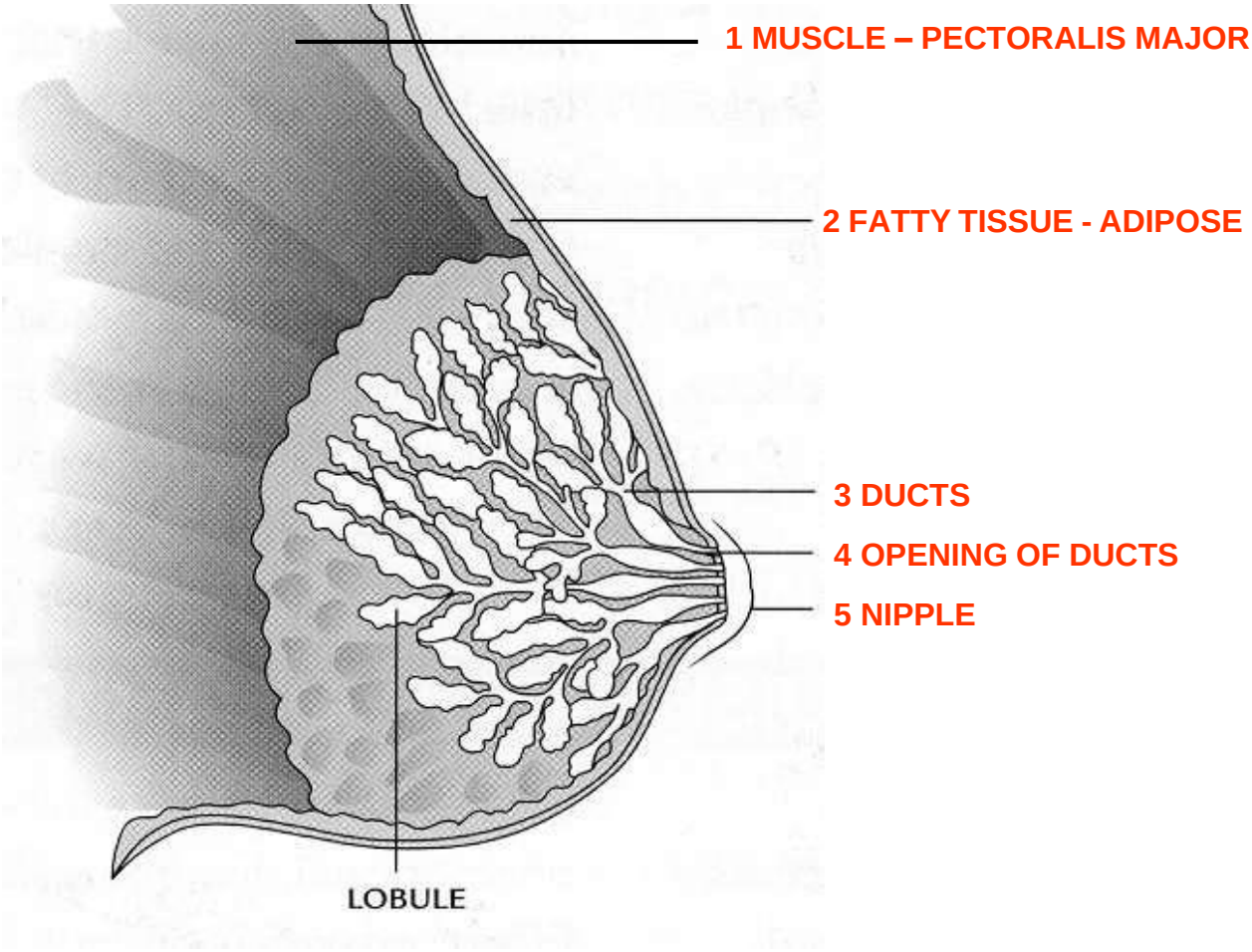
Annotated diagram of the Female Reproductive System

Name	Structure	Function
Pelvic Girdle	This consists of the two **innominate** bones and the sacrum and coccyx	Protects the internal organs of the **reproductive** system as well as the **bladder** and rectum. It **supports** the spine and provides attachment for muscles.
Uterus	Is a hollow **muscular** organ that sits at a right angle to the vagina. It is the shape and size of a pear and expands during pregnancy to accommodate the foetus. Its inner layer responds to hormonal secretions (menstrual cycle).	Where the **foetus** will grow and develop.
Fallopian Tubes	Funnel shaped tubes which start at the **uterus** and continue along to the ovaries.	Passageway for the ovum to reach the uterus and site for **fertilisation**. Sperm swim up these tubes to reach the ovum
Ovary	These are the female **gonads**. They are approx. the size of an **almond** and are positioned on either side of the uterus, just below the fallopian tubes.	Secrete hormones ➔ female sexual characteristics. Store ova (eggs) Release **ovum** once a month - **ovulation**
Cervix	Is a narrow neck of the uterus which opens into the **vagina**. It is usually a width of a pencil but **dilates** during **childbirth** to allow passage of baby.	Forms first part of birth canal. Cervical **dilation** is a measurement used to determine stage of childbirth.
Vagina	Is a **muscular** passage leading from the cervix to the vulva. It connects the **internal** sex organs with those on the outside of the body.	Connects cervix to vulva and thus to **outside** of body. Serves as a passageway for **menstrual** blood. Forms part of **birth** canal. Site of penetration during sexual intercourse
Labia	The external organs of the female reproductive system are known as the **vulva**. The labia (Minora & Majora) are fatty folds which protect the entrance to the vagina .	

STRUCTURE & FUNCTION OF MAMMARY GLANDS (BREAST TISSUE)

Although not directly involved in the process of reproduction, the breasts develop during pregnancy for function as **MILK SECRETING** glands (**Apocrine Glands**).

Breast tissue consists of **areolar** and **adipose** tissue supported by fascia.



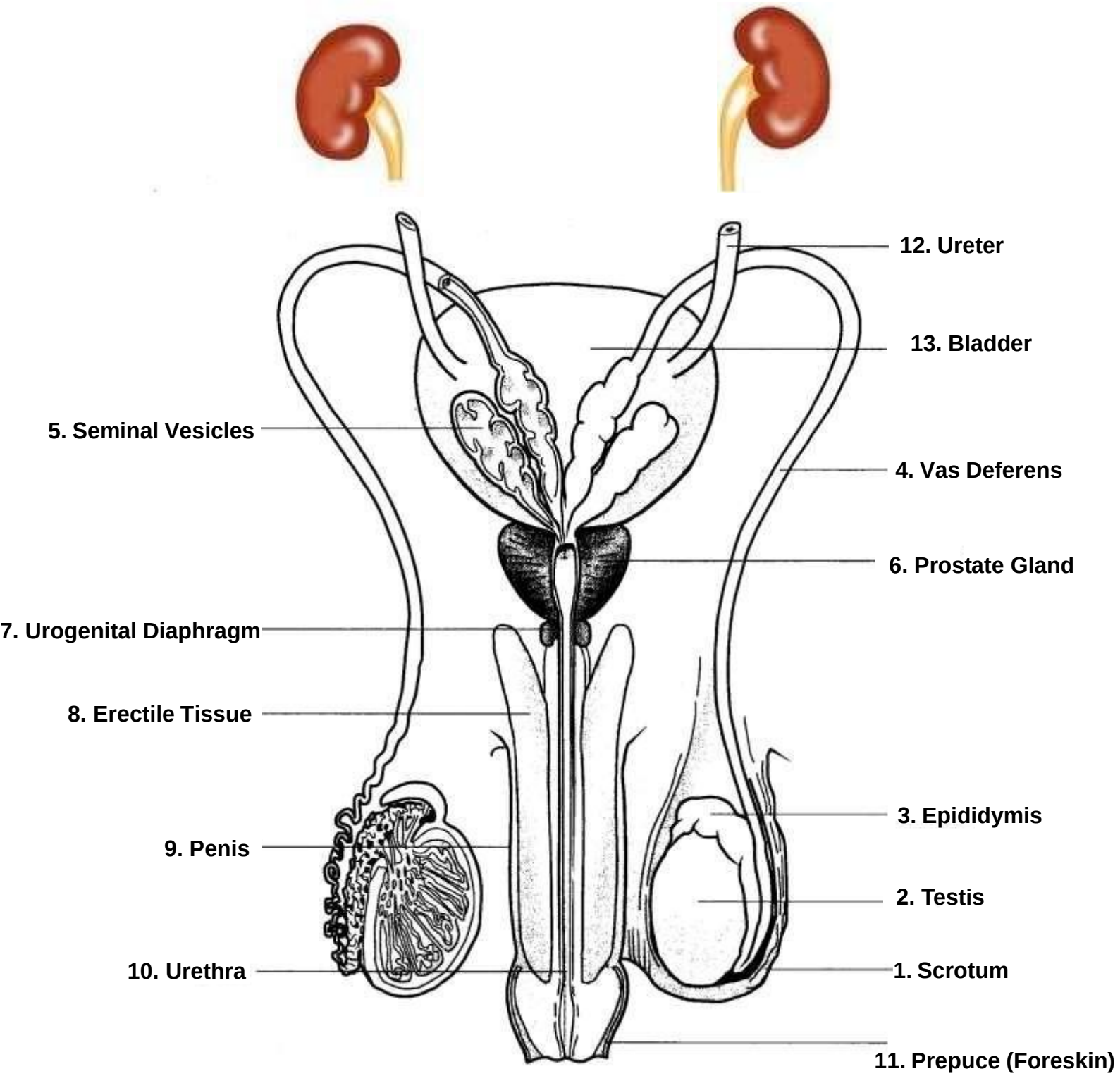
The breasts are divided into lobes and these are further subdivided into **lobules**, which open into ducts.

These ducts open on the surface of the nipple.

During **pregnancy** the lobules develop and produce milk.

Hormones cause the breast to grow during puberty as well as pregnancy when milk secretion is activated.

Breast tissue exists in both males and females, but is underdeveloped in males.



Annotated diagram of the Male Reproductive System (Posterior View)

Name	Structure	Function
Pelvic Girdle	This consists of the two **INNOMINATE** bones and the sacrum and coccyx	Protects the internal organs of the **REPRODUCTIVE** system as well as the **BLADDER** and rectum. It **SUPPORTS** the spine and provides attachment for muscles
Prostate	Small gland situated between the **bladder** and **rectum** **It surrounds the beginning of the urethra**	Produces two **secretions** carried in the **semen** One helps keep the urethra moist Other is part of seminal fluid which helps semen to travel along urethra and into female.
Testes	These are the male **gonads** contained in the **scrotum** They develop in the abdomen and descend into the scrotum just before birth.	Produce **sperm** Produce **testosterone** which is a male hormone ➔ male sexual characteristics. Testes are kept at 35 C – ideal temp at which sperm develop.
Testicular Vessels ▪ ***Epididymis*** ▪ ***Vas deferens***	**1. Epididymis** Coiled tube and opens from the top of each **testes**. It then continues to become the **vas deferens** **2. Vas deferens** Duct with a muscular wall from the epididymis to the **seminal vesicles**.	Store and transport sperm as well as act as site where immature sperm can develop. Passageway for transport of sperm from epididymis to Urethra and eventually to the penis. By contracting its muscular walls the vas deferens pushes sperm forward.
Penis	Is main external sex organ of the male. Consists of 3 **erectile** tissues running lengthways. One on either side of the urethra and one underneath. This last one becomes the tip of the penis known as the **glans**. This is full of blood vessels. The glans is covered by a **protective** foreskin (prepuce)	Has a double role: **1.** Organ of **excretion** **2.** Organ of **reproduction** An erection occurs due to vasodilation of the blood vessels which expand the erectile tissue. The rigidity allows for penetration into the vagina and deposition of sperm.
Scrotum	This is essentially a **sac** which contains the testes. Outer layer – skin Inner layer – muscle	Supports **testes** Maintains correct **temperature** By contacting the muscles it draws testes up into the body in the **cold** weather. In warm weather the muscle relaxes and the testes drop ➔ lowers temp.

The Urinary System

THE URINARY SYSTEM

This system aims to excrete waste from the body in the form of urea. It consists of a filtering organ - the kidney, a storage pouch - the bladder and an exit tube - the urethra.

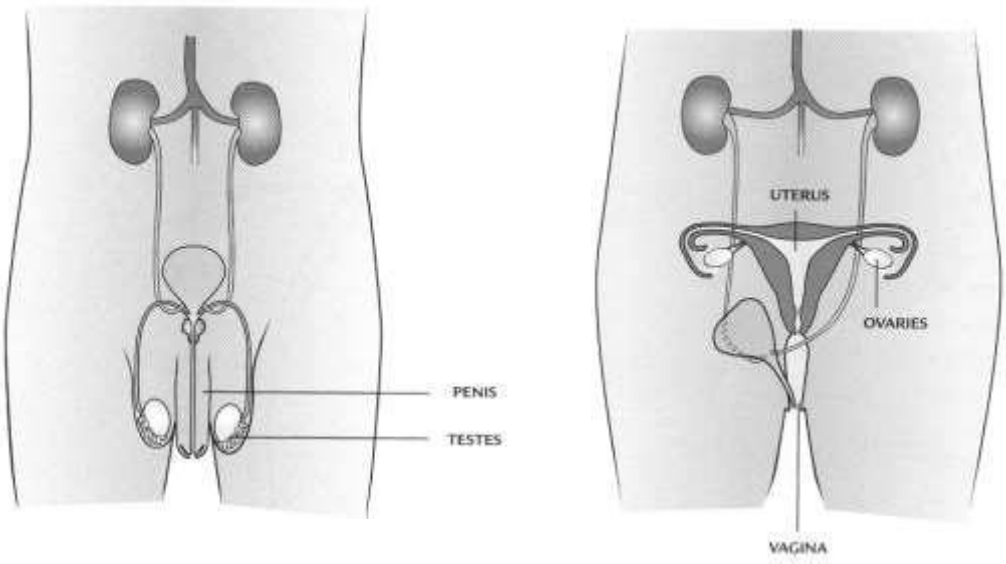


Diagram of the Urinary System

THE KIDNEYS

There are two kidneys (right and left) which are found on the posterior abdominal wall.

It consists of 2 parts:

1. **Cortex** (outer part)
2. **Medulla** (inner Part)

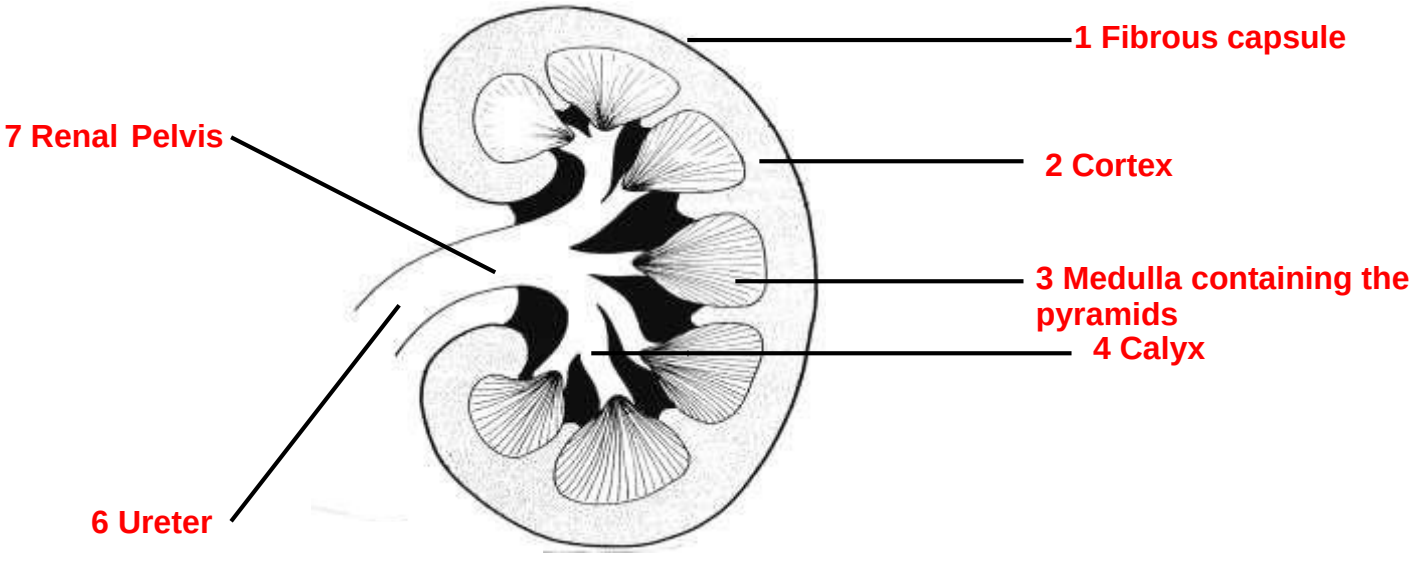
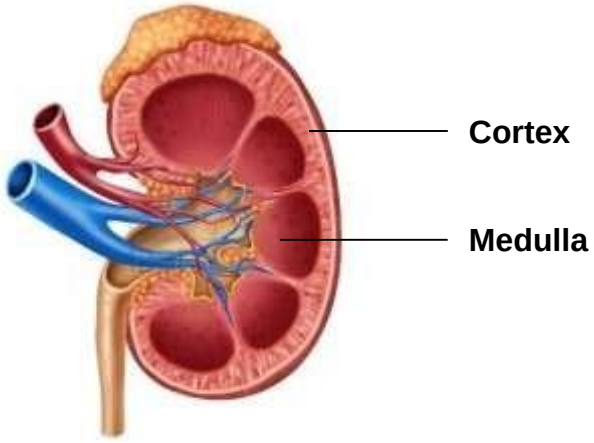


Diagram of a cross section of a Kidney

Name	Structure	Function
Kidney	Has two distinct parts: **1. CORTEX** which is on the **OUTSIDE** **2. MEDULLA** which is on the **INSIDE** 	To filter the **<u>blood</u>** To reabsorb useful materials
Renal Pelvis	**Funnel shaped cavity** which connects the medulla to the ureter.	Collects urine from the tubules in the medulla and passes it into the ureter
Ureter	These are tubes which connect the kidney to the **BLADDER**	To take urine from the kidneys into the bladder
Bladder	Sac like, muscle walled organ which collects urine.	Reservoir for urine. About 200ml collects before the autonomic nervous system is stimulated and the walls contract. At the same time the internal sphincter relaxes thus allowing the emptying of urine into the urethra
Urethra	A narrow tube passing from the bladder to the outside of the body. It has an external sphincter, which is voluntarily controlled by the Central Nervous System (CNS). It is shorter in women thus making them more susceptible to infection.	To take urine from the bladder to the outside.

THE PRODUCTION OF URINE

Kidney tissue is made up of over a million twisted tubes called **nephrons**

This is where the filtration and production of urine takes place.

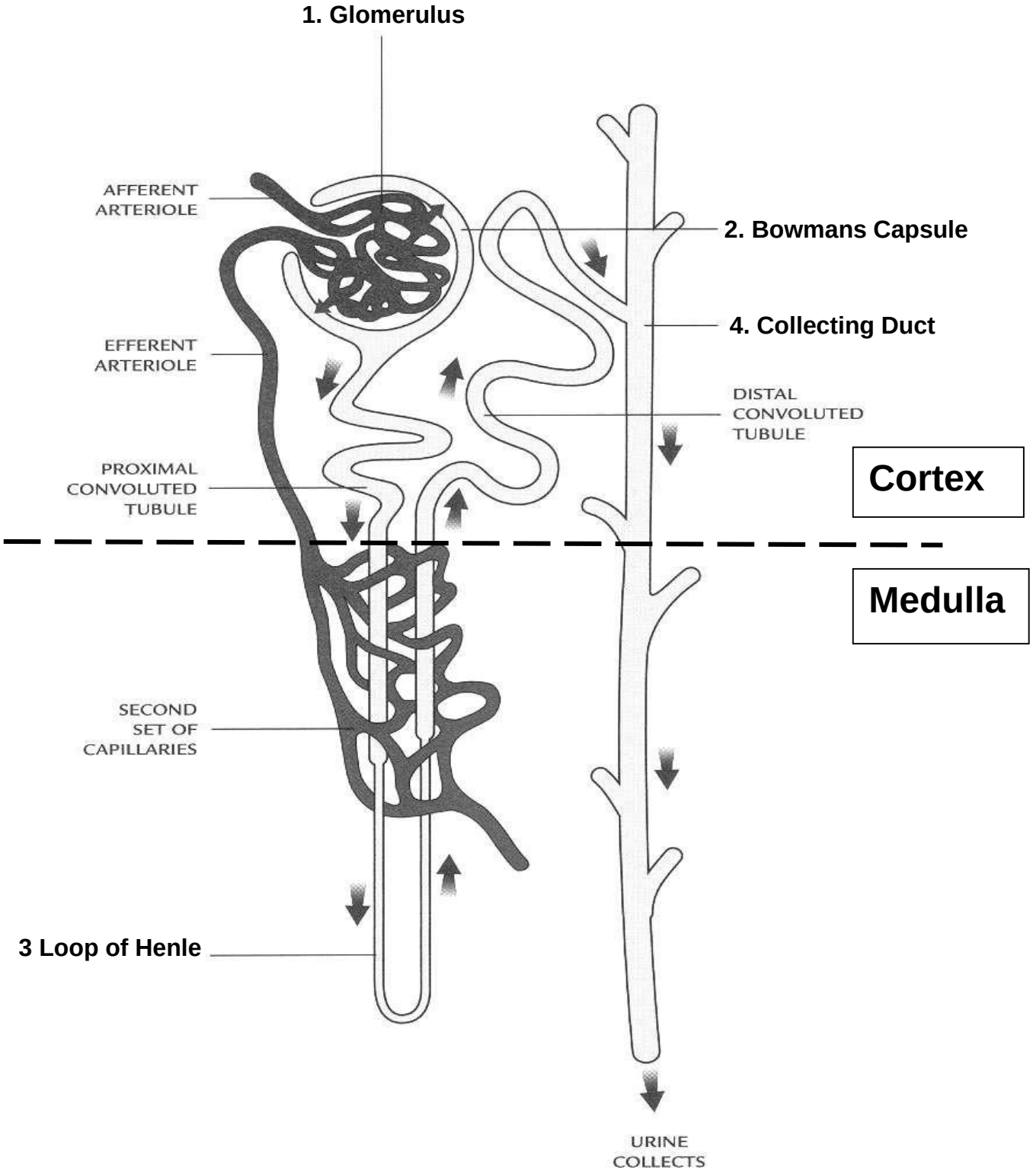


Diagram of the Nephron

PRODUCTION OF URINE

There are 3 stages to the production of urine.

1. ***FILTRATION IN THE BOWMANS CAPSULE***

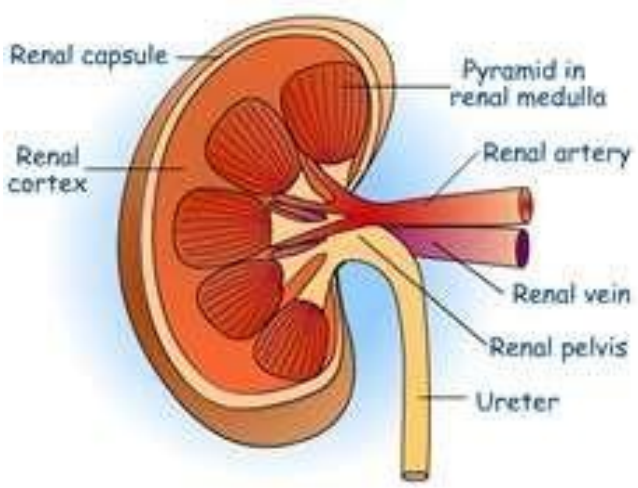
Blood entering the afferent arterioles and the **glomerulus** are under pressure. Since the capillary walls are **permeable** to **water** and other substances, these pass into the **bowmans capsules**, whilst **blood cells** and **protein** remain in the blood vessels.
Note that the Bowman's capsule has also collected other substances which are not waste and these will be **re-absorbed** as they pass through the nephron.

2. ***RE-ABSOPRTION IN THE CONVOLUTED TUBULES***

Filtered substances collected by the Bowman's Capsule are passed into a system of twisted tubes called the **Convoluted Tubules**. Reabsorption takes place in the tubules. Cells in the lining of tubules are able to absorb any **water**, **glucose**, **salts**, and **ions** which the body needs. Note that only **1%** of the liquid filtered into the Bowman's Capsule is actually excreted as urine. The rest is re-absorbed.

3. ***COLLECTION IN THE PELVIC CALYCES***

The nephron straightens out into the **collecting tube** in the **medulla**. The Collecting tubes form masses called **pyramids** the tops of which stick up in the renal pelvis. The branches of the Pelvis connect with the tops of the Pyramids and collect the waste liquid (Urine). This is then passed into the **ureter** and into the **bladder**.



URINE COMPOSITION

The average composition of urine is:

1. 96% water

2. 2% urea

3. 2% other substances e.g. **ammonia, sodium, potassium, phosphates, chlorides, sulphates and excess vitamins**

The salts must be excreted in order to maintain the correct balance of fluids and electrolytes in the body.

The colour of urine comes from **bilirubin** which is a **bile** pigment.

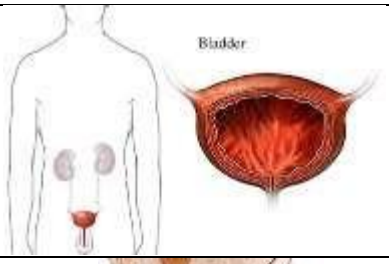
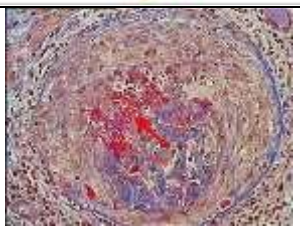
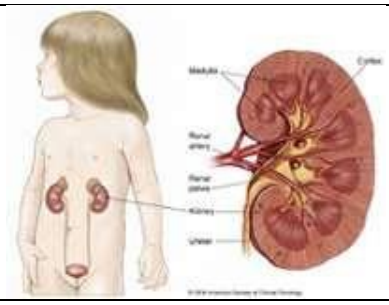
Urine is normally **acidic** in nature.

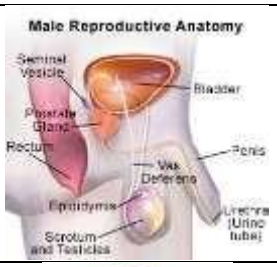
About **1.5** litres of urine are produced daily.

The amount of urine is increased/decreased by:

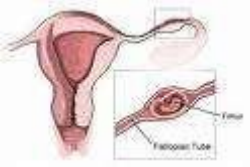
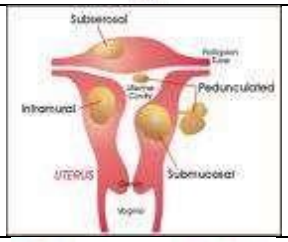
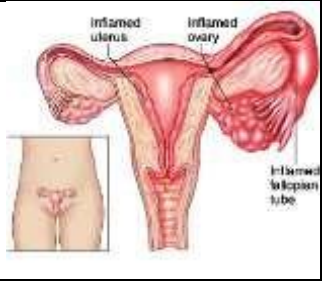
Increased Urine Production	Decreased Urine Production
Increased fluid uptake	Decreased fluid up take
Cold weather	Hot weather
Inactivity	Exercise

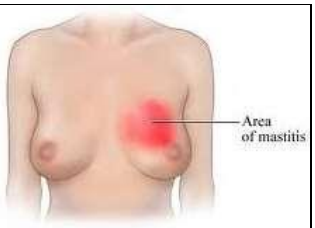
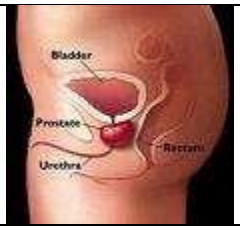
DISEASES & DISORDERS OF THE URINARY SYSTEM

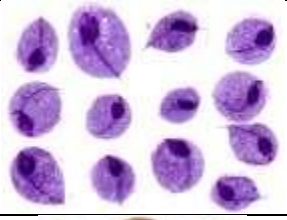
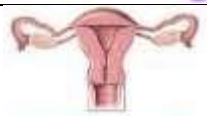
Disorder	Description	Picture
Cystitis	Inflammation of the bladder, causing pain when urinating. Sometimes caused by infections. Very common in women due in part to the shorter length of the female urethra.	
Dysuria	Painful or difficult you urination, most commonly caused by infection or inflammation.	
Glomerulonephritis	A type of glomerular kidney disease in which the kidneys filters become inflamed and scarred, and slowly lose the ability to remove wastes and excess fluid from the blood to make urin	
Incontinence	An involuntary urination or defaecation.	
Kidney Stones	Deposits of substances found in urine which form solid stones within the renal pelvis, bladder or ureters. Extremely painful and often removed by surgery.	
Nephritis (Bright's Disease)	Inflammation of the kidney, resulting from causes other than infection. Often used to refer to a wide range of different inflammatory disorders.	
Nephroblastoma	The tumour kidneys which typically affects children.	

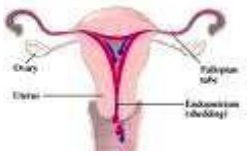
Disorder	Description	Picture
Urethritis	Inflammation of the urethra which results in painful urination.	
Pyelonephritis / Glomemlonephritis	Inflammation of the kidney and its pelvis caused by bacterial infection.	
Renal Colic	Is a type of pain commonly caused by the obstruction to the flow of urine, often caused by kidney stones.	
Uraemia	An occumulation in the blood of nitrogenous waste products (urea) that are usually excreted in the urine.	
Urinary Tract infections (UTI)	Is a bacterial infection that affects any part of the urinary tract.	

DISEASES & DISORDERS OF THE REPRODUCTIVE SYSTEM

Disorder	Description	Picture
Chlamydia	A sexually transmitted infection caused by bacteria of the genus Chlamydia; may cause genital inflammation, discharge, pelvic pain and fever.	
Ectopic Pregnancy	This is a pregnancy which occurs outside the uterus. A fertilised ovum may develop inside the Fallopian tube instead of travelling to the uterus. There is a danger of haemorrhage and death.	
Endometriosis	The presence of endometrium elsewhere than in the lining of the uterus; causes premenstrual pain and dysmenorrheal.	
Fibroids	A benign tumour of the uterus that is comprised of either fibrous connective tissue or muscle.	
Hysterectomy	An operation in which the uterus is removed.	
Polycystic Ovarian Syndrome - PCOS *(also known as Stein-Leventhal syndrome)*	Cause: hyposecretion of female sex hormones (luteinising hormone). **Effect**: irregular menstrual cycle, multiple growth of follicular ovarian cysts and sometimes infertility, enlarged ovaries, 50% of patients are obese and become hirsute (hairy); age range of sufferers is usually 16-30.	
Toxic Shock Syndrome (TSS)	This is a rare potentially fatal illness caused by a bacterial toxin.	
Pelvic Inflammatory Disease	An inflammation of the female pelvic organs (especially the fallopian tubes) caused by an infection by any of several micro-organisms.	

Mastitis	Inflammation of the breast	
Prostatitis	Inflammation of the prostate gland characterized by perinea! pain, irregular urination and (if severe) chills and fever.	

Sexually Transmitted Disorders (STD)		
Gonorrhoea	A common venereal disease caused by the bacterium Neisseria Gonorrhoeae; symptoms are painful urination and pain around the uterus.	
Syphilis	A sexually transmitted disease caused by the spirochetal bacterium.	
Trichomonas	Commonly called “trick”. It is caused by a single celled organism that is a member of the protozoa family of micro-organisms. Infection causes a frothy, greenish-yellow discharge.	
Vaginitis	Any inflammation of the vagina, usually referring to an infection due to bacteria, yeast or other pathogens that result in discomfort, itching, and/or abnormal discharge.	 
Vulvovaginal Candidiasis *(Thrush)*	A yeast infection of the vagina.	

Menstrual Disorders		
Amenorrhoea	Causes: can be caused by hypersecretion of testosterone in females, other hormonal imbalances, stress, radical weight loss, anaemia or excessive exercise. Effect: absence of menstruation.	
Dysmenorrhoea	Causes: spasm or congestion of the uterus, imbalance in hormones or emotional disturbances. Effect: extremely difficult and painful menstruation.	
Menorrhagia	An abnormally heavy and prolonged menstrual period at regular intervals. Causes may be due to abnormal blood clotting, disruption of normal hormonal regulation of periods or disorders of the endometrial lining of the uterus.	
Premenstrual Syndrome	Cause: onset of menstruation; usually occurs about one week before. Effect: depression, irritability, bloating and water retention, swollen and tender breast tissue (mastalgia), restlessness.	
Menopause	The time in a woman's life in which the menstrual cycle ends.	

INTERRELATIONSHIP OF URINARY SYSTEM WITH OTHER BODY SYSTEMS

Skeletal	The kidneys help to stimulate the production of bone marrow in the long bones.
CVS	The kidneys purify all the blood in the body.
Endocrine	Kidneys produce the enzyme which helps to regulate BP as part of the system involving hormones.
Skin	The urinary system removes waste by excretion and therefore links to the other excretory system – the skin.

INTERRELATIONSHIP OF REPRODUCTIVE SYSTEM WITH OTHER BODY SYSTEMS

Endocrine	Hormones from the endocrine system govern the reproductive system particularly in females.
Nervous	Sexual stimulus is relayed by nerve impulses.

EFFECTS OF MASSAGE ON THE GENITO~URINARY SYSTEM

Urinary

- Possibly increases production of urine thereby helping removal of waste and toxins from body.

Reproductive

- Womb is a muscle (look at effects of massage on muscle) and therefore can assist in the menstrual cycle – decongestion of blood.

SYMPTOMS OF THE GENITO-URINARY SYSYEM

Reproductive System

- Infertility
- Disturbance of the menstrual cycle – amenorrhea, dysmenorrhoea, mid cycle bleeding
- Pain
- Impotence / drop in Libido

Urinary System

- Pain on urination (burning sensation)
- Increased urine production / frequency
- Reduced urine production
- Urinary Incontinence
- Problems starting and stopping (especially with prostate problems)
- Changes in urine colour
- Foul smelling urine (infection?)