Human Reproduction

Testis (Male Gonads) → **Spermatogenesis (Meiosis)** → **Sperms**

Ovaries (Female gonads) → **Oogenesis (Meiosis)** → **Ova**

(Gametogenesis-formation of gametes)

Insemination of Sperms into Female Genital Tract/ Sexual Intercourse

Fertilization of sperm with ova inside fallopian tube

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Zygote (2n)

↓ **Embryogenesis (Mitosis)**

Formation of Blastocyst (Embryo)

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Implantation of Blastocyst at uterine wall

↓ **Gestation (Development of Embryo)**

Development of complete Foetus (till 9 months)

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Parturition (Delivery of Baby after 9 months)

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Lactation (Child Care-Milk feeding)

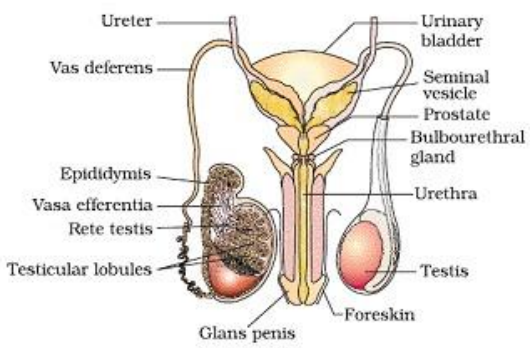
Some Important Terms:

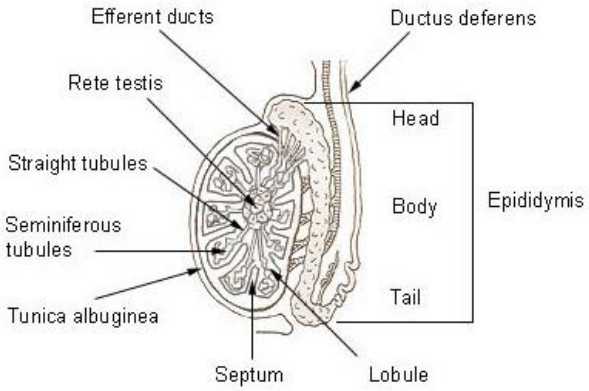
- Reproductive event starts after **puberty** (age at which Male or female becomes reproductively active).
- Puberty Age for Male-12-16 years and of female is 10-14years.
- Secondary Sexual Characters: The characters develops due to hormonal changes at the age of puberty that helps in distinguish between male and female.

Males	Females
Facial Hairs, Adam's Apple, Hoarsening of voice, Broadening of shoulders, Broadening of chest, Body Hairs, Under arms hairs, pubic hairs.	Development of Breast, Shrill and high pitch voice, Broadening of pelvic region, pubic hairs, Menstruation cycle

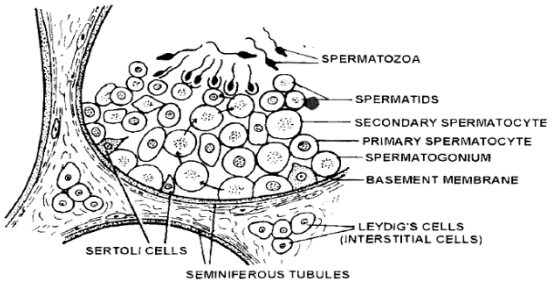
- Sperm formation continues even in old men, but formation of ovum ceases in women at age of 50 years.

The Male Reproductive System:





a) Primary sex organs- Testis or Male Gonads



a) A pair of testis is oval in shape 4-5cm in length & 2-3 cm in width.
b) Each testes contain 250 testicular lobules.
c) Each lobule contain **1-3** highly coiled **seminiferous tubules**
d) Each seminiferous tubules is lined by two types of cells,
    a. **Spermatogonia** (Male germ cell) -Undergo miosis to produce sperm.
    b. **Sertoli cells**. (Nurse Cell)- provide nourishment during sperm development.
        Secrete Androgen Binding Protein which helps in initiating spermatogenesis.
        Secrete Sperm Maturation Factor which helps in production of Mature Sperm.
e) **Leydig cells** or **Interstitial cells** present in interstitial fluid around the seminiferous tubules synthesize and secrete Androgen hormone.
f) Testis are formed in abdominal cavity short before birth they descend into scrotum through **Inguinal Canal.**
g) Inguinal canal along with muscles, blood vessels, nerves, conducting ducts is called **Spermatile Cord.**
h) **Testis consist of three layers:**
    1) Tunica Vaginalis- Outer, Fibrous, Incomplete
    2) Tunica Albuginea – Middle , Produce 200-250 lobules
    3) Tunica Vasculosa- Contains Blood vessels

b) Secondary sex organs

Male Accessory Ducts	
Rete testis	Open space along inner side of testis where seminiferous tubules open
Vasa Efferentia	No. of small tubules that emerge from rete testis and fuse to epididymis
Epididymis	Highly coiled (6 meter) tube located along posterior side of testis. It concentrates and stores sperms till they get matures
Vas Deferentia	Sperm Duct- Short straight tube store. Forms loop over urinary bladder & transport sperm to urethra. Forms Ejaculatory duct with Seminal Vesicle duct.
Urethra (ejaculatory duct)	Urinogenital Tract- common duct for sperm and urine. About 10 inch /20 cm long,

Male Accessory Glands		
Seminal Vesicles (One Pair)	**Prostate Gland (Single)**	**Bulbourethral Gland (One Pair) Cowper's Gland**
60-70% of Semen PH-7.4 Alkaline Yellow and Viscus Fructose Clotting Enzyme (Fibrinogen) keeps the sperm coagulated and adhere to cervix. It also prevent sperm from escaping.	20-25% PH-6.5 Slightly Acetic Milky Fluid Release Ca++ ion De-clotting Enzyme activate Sperm in vaginal tract.	Alkaline Transparent Lubrication of penis Maintain Alkaline PH of urethra (Sperm die in acidic medium)

External genitalia	
Penis	**Scrotum**
Glans Penis- enlarged end of Penis **Foreskin (Prepuce) -**loose fold of skin over glans penis **Corpus Cavernosum –** A pair of erectile tissue contains blood help in erection **Corpus Spongiosum** – mass of erectile tissue terminates into Glans Penis **Urethral Meatus –** external opening of penis	A Sac like structure containing a pair of Testis out side abdominal cavity. Helps in maintaining 2-3°C low temp. than body temp.