

Human Reproduction

Human Reproduction

- Humans are sexually reproducing and viviparous organisms.
- The process of reproduction in humans involves a series of complex and well-regulated events that occur after the onset of **puberty**.

Major Reproductive Events in Humans

1. Gametogenesis

- Formation of gametes:
- Spermatogenesis in males (formation of sperm)
- Oogenesis in females (formation of ovum)

2. Insemination

- Transfer of sperms from the male into the female genital tract

3. Fertilisation

- Fusion of male and female gametes (sperm and ovum)
- Leads to the formation of a **zygote**

4. Blastocyst Formation and Implantation

- Zygote develops into a blastocyst
- The blastocyst attaches to the uterine wall (implantation)

5. Gestation (Embryonic Development)

- Development of the embryo and fetus inside the uterus

6. Parturition

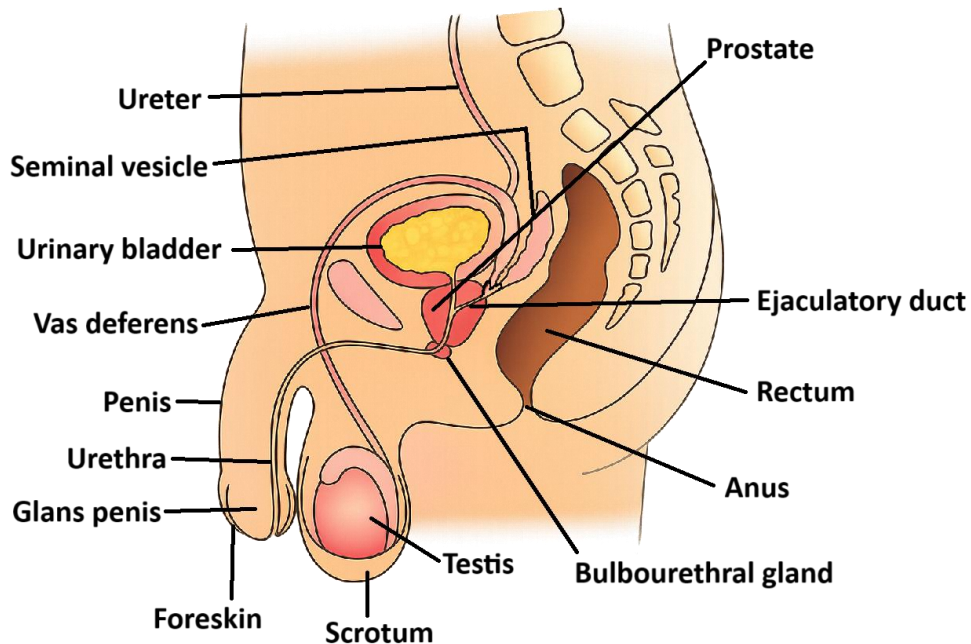
- Delivery of the fully developed baby

Sexual Dimorphism in Reproductive Events

- **Males:** Sperm production continues throughout life, even into old age.
- **Females:** Ovum production (oogenesis) ceases around the age of 50 years, marking menopause.

The Male Reproductive System

- The **male reproductive system** is located in the pelvic region and consists of the following main components:
 - A pair of testes
 - Accessory ducts
 - Accessory glands
 - External genitalia



Diagrammatic sectional view of male pelvis showing reproductive system

Testes

- A pair of testes is the primary sex organ.
- They are located outside the abdominal cavity in a pouch called the **scrotum**.
- The scrotum helps maintain a temperature 2–2.5°C lower than the normal body temperature—essential for spermatogenesis (sperm production).

A. Structure of the Testes

- Each testis is oval in shape, measuring approximately **4–5 cm** in length and **2–3 cm** in width.
- It is enclosed by a dense protective covering.
- Internally, each testis contains about 250 compartments called **testicular lobules**.

B. Testicular Lobules

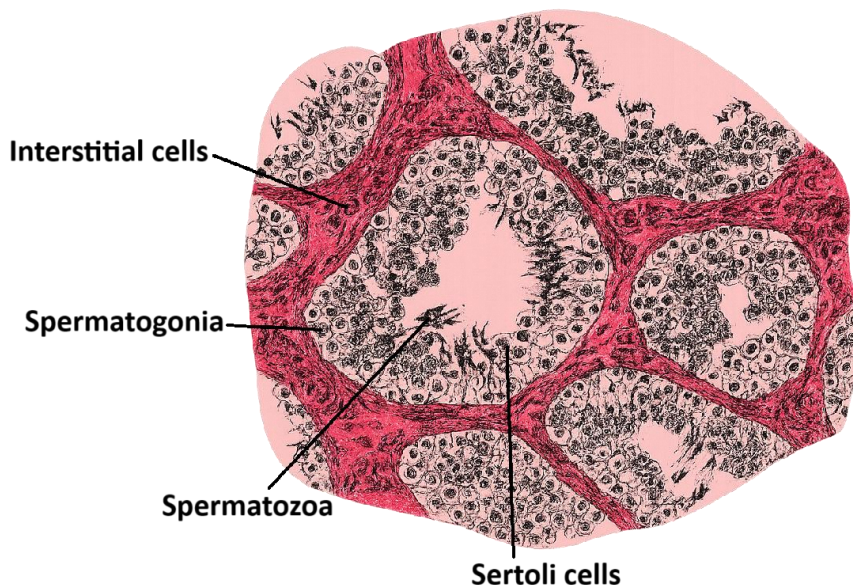
- Each lobule contains 1 to 3 highly coiled seminiferous tubules where sperms are produced.

C. Seminiferous Tubules

- The seminiferous tubules are lined with:
 - Male germ cells (spermatogonia) – These undergo meiotic divisions to form sperms.
 - Sertoli cells – These provide nutrition and support to developing germ cells.

D. Interstitial Spaces

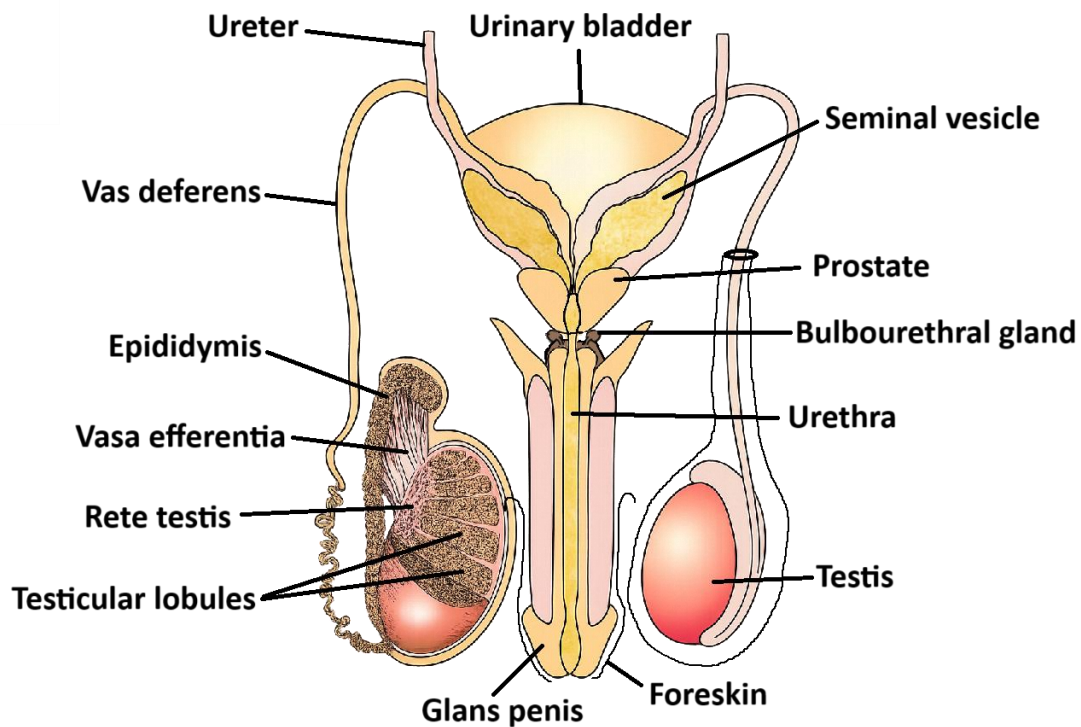
- The areas between the seminiferous tubules are called **interstitial spaces**.
- These spaces contain:
 - Blood vessels
 - Leydig cells (interstitial cells) – These synthesize and secrete androgens (testicular hormones).
 - Other immunologically competent cells.



Diagrammatic sectional view of seminiferous tubule

Male Sex Accessory Ducts

- The accessory ducts include:
 - Rete testis
 - Vasa efferentia
 - Epididymis
 - Vas deferens



Diagrammatic view of male reproductive system (part of testis is open to show inner details)

Pathway of Sperm Transport

1. Seminiferous tubules → Rete testis
2. Rete testis → Vasa efferentia
3. Vasa efferentia → Epididymis (along the posterior side of each testis)
4. Epididymis → Vas deferens
 - The vas deferens ascends into the abdomen, loops over the urinary bladder, and joins the duct from the seminal vesicle.
 - This union forms the ejaculatory duct, which opens into the **urethra**.
- The urethra passes through the penis and ends at the external opening called the **urethral meatus**, allowing for the release of semen and urine.

Penis – The External Genitalia

- The **penis** is the male external genital organ.
- It is composed of erectile tissue that allows for erection, facilitating the insertion of sperm into the female reproductive tract (insemination).
- The glans penis is the enlarged tip of the penis, which is covered by a loose fold of skin known as the **foreskin**.

Male Accessory Glands

- These glands play a key role in semen production and sperm function.
- They include:
 1. Paired Seminal Vesicles

2. Prostate Gland

3. Paired Bulbourethral Glands

- These glands secrete fluids that form the **seminal plasma**, which is:
 - Rich in fructose (energy source for sperm)
 - Contains calcium and enzymes
- The bulbourethral gland secretion also helps **lubricate** the penis during intercourse.

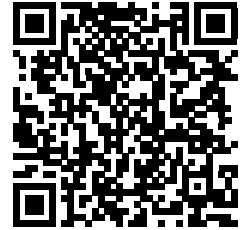


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