

Chapter 11: The Reproductive System

1. Introduction:

The reproductive system is responsible for producing offspring and ensuring the continuation of the species. It includes reproductive organs and associated structures, with distinct differences between males and females.

2. Male Reproductive System:

- **Primary Organs:** Testes (produce sperm and testosterone).
 - **Accessory Glands:**
 - **Seminal Vesicles:** Produce seminal fluid.
 - **Prostate Gland:** Secretes an alkaline fluid.
 - **Cowper's Gland:** Lubricates and neutralizes acidity.
 - **Ducts:** Vas deferens, urethra (pathway for sperm).
 - **External Organ:** Penis (delivers sperm into the female reproductive tract).
 - **Secondary Sexual Characters:** Deep voice, facial hair, muscular build (due to testosterone).
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3. Female Reproductive System:

- **Primary Organs:** Ovaries (produce ova/eggs and hormones like estrogen and progesterone).
 - **Accessory Organs:**
 - **Fallopian Tubes:** Site of fertilization.
 - **Uterus:** Site of implantation and fetal development.
 - **Vagina:** Receives sperm; serves as the birth canal.
 - **Secondary Sexual Characters:** Breast development, wider hips, menstrual cycle (due to estrogen and progesterone).
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4. Gametes:

- **Sperm:** Produced in testes; has a head (with nucleus), middle piece (with mitochondria), and tail (for motility).

- **Ovum (Egg):** Produced in ovaries; contains a large cytoplasm, nucleus, and protective layers.
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5. Fertilization and Development:

- **Fertilization:** Fusion of sperm and egg in the fallopian tube, forming a zygote.
 - **Implantation:** Attachment of the zygote to the uterine wall.
 - **Placenta:**
 - **Functions:**
 - Nutrition: Transfers nutrients from mother to fetus.
 - Respiration: Exchanges gases (O₂ and CO₂).
 - Excretion: Removes fetal waste.
 - Endocrine Function: Produces hormones like hCG to maintain pregnancy.
 - **Foetal Membranes and Amniotic Fluid:**
 - Protects the embryo.
 - Provides cushioning and maintains temperature.
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6. Menstrual Cycle:

- A 28-day cycle in females involving the preparation of the uterus for pregnancy.
 - **Phases:**
 - **Menstrual Phase (1-5 days):** Shedding of uterine lining.
 - **Follicular Phase (6-14 days):** Follicle development, estrogen secretion.
 - **Ovulation (Day 14):** Release of the mature egg.
 - **Luteal Phase (15-28 days):** Corpus luteum formation, progesterone secretion.
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7. Role of Sex Hormones:

- **Testosterone (Male):** Develops secondary sexual traits, sperm production.
 - **Estrogen (Female):** Regulates menstrual cycle, development of female traits.
 - **Progesterone (Female):** Maintains pregnancy, prepares uterus for implantation.
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8. Twins:

- **Identical Twins:** Formed from one zygote splitting; genetically identical.
- **Fraternal Twins:** Formed from two separate eggs fertilized by two different sperms; genetically different.

9. Important Terms:

- **Gestation:** Duration of pregnancy (~9 months).
 - **Parturition:** Process of childbirth.
 - **Amniotic Fluid:** Surrounds and protects the developing fetus.
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