The duct system

Human life cycle

Spermatogenesis

Takes place in seminiferous tubules of testes—entire process takes 64-72 days

At puberty, FSH is secreted by the anterior pituitary gland
Spermatogenesis

Takes place in seminiferous tubules of testes—entire process takes 74-72 days.

At puberty, FSH is secreted by the anterior pituitary gland.

Spermatids are created by meiosis.

Anatomy of the male

*Interstitial cells* lie between the seminiferous tubules; produce *androgens* (testosterone).

Testosterone and sex characteristics

*Testosterone* is produced continuously from puberty on.

The rising blood levels stimulate growth spurts, and development of *secondary sex characteristics*:

- deepening of voice
- increased hair growth
- enlargement of skeletal muscles
- increased heaviness of skeleton
Accessory glands & semen

**Seminal vesicles:** produce about 60% of fluid volume of semen; rich in sugar, vitamin C that nourish sperm

**Prostate gland:** secretes a milky fluid that plays a role in activating sperm

**Bulbourethral glands:** produces a clear fluid that passes down the urethra, cleansing it before semen is ejaculated

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Female anatomy

![Female anatomy diagram](image)

**Ovaries**

![Ovaries diagram](image)

**Oogenesis**

![Oogenesis diagram](image)
Menstrual cycle

Estrogens and sex characteristics

In addition to the production of ova, the production of estrogens also begins at puberty.

Female secondary sex characteristics include:
- Enlargement of accessory organs
- Development of the breasts
- Appearance of axillary and pubic hair
- Increased deposits of fat, around hips and breasts
- Widening and lightening of the pelvis
- Onset of menses

Fertilization

Parturition
Procreation

Coitus is divided into 4 phases:
- Excitement
- Plateau
- Orgasm
- Resolution

Excitement

Males:
- Erection of penis
Females:
- Erection of clitoris, vaginal lubrication

Orgasm

In both sexes: series of muscular contractions, pleasurable sensations, increased blood pressure, heart rate, respiration rate
In males: usually accompanied by ejaculation of semen from penis
In females: uterus and vaginal walls contract

Erection & Emission

Parasympathetic vasodilation is stimulated, “flooding” the penis with blood
Passively compresses veins draining blood from penis
This accumulation of blood in the penis leads to erection in 5-10 seconds
Erection & Emission

Erection reflex

Both erection and ejaculation can occur in the absence of mechanical stimulation
Nonsexual penile erection accompanies REM sleep

Our general ‘themes’
1. The coupling of form with function
2. Emergent properties (emergence)
3. Integration of traits
4. Homeostasis
5. Proximate-ultimate causation
6. Human evolutionary history