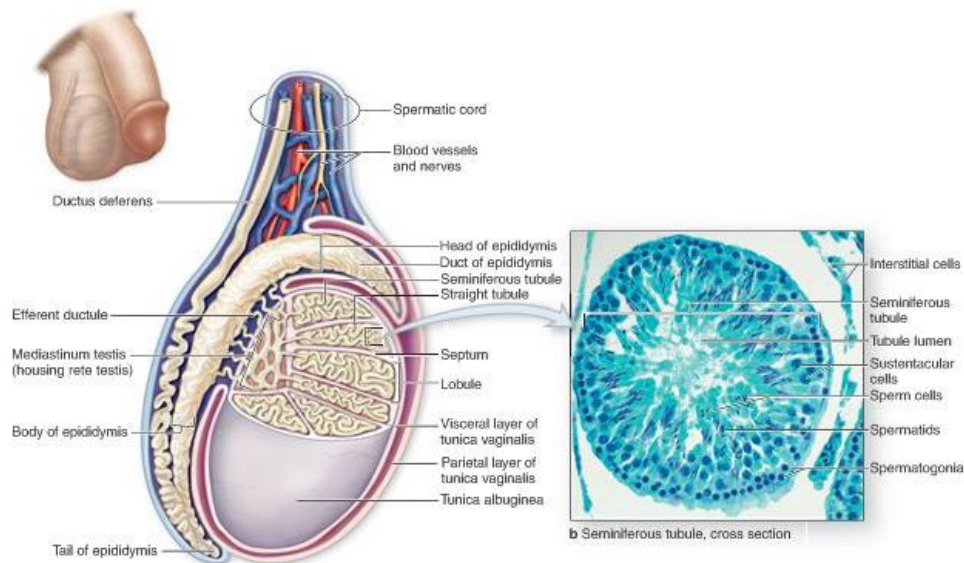




Taken from Mescher, Junqueira's Basic Histology: Text and Atlas, Twelfth Edition.

Clinical note

- Cryptorchidism is failure of descent of the testes into the scrotum
- Testes maintained at core body temperature
- Some cases spermatogenesis can occur normally if they are surgically removed to the testes
- So important to check newborns that the testes are present in the scrotum
- Germ cell proliferation is inhibited at core body temperature, but testosterone synthesis by interstitial cells is not, so secondary sex characteristics are not affected
- Spermatogonia affected by alcohol, malnutrition and certain drugs
- Interstitial cell tumours can cause precocious puberty

Seminiferous tubules

- ~200 million sperm produced per day
- Each tubule is a convoluted loop linked by a straight tubule to the rete testis
- The rete testis is a labyrinth of epithelium-lined channels in the mediastinum testis
- Efferent ductules connect the rete testis to the epididymis
- Seminiferous tubules are lined with complex, specialised stratified epithelium (seminiferous epithelium)
- Basement membrane covered by fibrous connective tissue lined with myoid cells, allowing weak contractions
- Two types of cells in the seminiferous epithelium
 - Sustentacular (Sertoli cells): non-dividing, supportive
 - Proliferative cells of the spermatogenic lineage

- Spermatids become oriented toward the base of the Sertoli cells, with acrosomes projecting toward the lumen
- Nuclei become elongated, with condensed chromatin
- Flagella growth continues; mitochondria aggregate nearby, forming a thickened region known as the middle piece
- Maturation phase
 - Unneeded cytoplasm is shed as a residual body, and phagocytosed by Sertoli cells
 - Mature sperm released into the tubule lumen

Clinical note

- Immotile cilia syndrome is characterised by immotile spermatozoa and thus infertility
- Caused by lack of dynein or other protein required for cilia and flagella motility
- Usually have chronic respiratory infections

Sertoli cells

- Columnar or pyramidal, envelope the spermatogenic cells providing support
- Bases adhere to basal lamina and apices extend to lumen
- Have numerous lateral processes to the spermatogenic cells
- Each cell supports 30-50 germ cells at various stages of development
- Abundant SER, some RER, well developed Golgi, numerous mitochondria and lysosomes, elongated (triangular) nucleus
- Tight junctions between the basolateral membranes of adjacent Sertoli cells forms a blood-testes barrier in the seminiferous epithelium
 - Prevents autoimmune attack
- Spermatogonia lie in the basal compartment, below the junctions and open to the vascularised interstitial tissue, which contains lymphocytes and APCs
- Early in meiosis, spermatocytes temporarily disrupt the cell-cell junctions, moving into the adluminal compartment without compromising the barrier
- Spermatocytes and spermatids adhere closely to the Sertoli cells, lying within deep invaginations of the lateral and apical membranes (above the barrier)
- As the flagellar tails of the spermatids develop, they appear as tufts extending from the apical surface of the Sertoli cells
- Sertoli cells also connected via gap junctions
- Functions of Sertoli cells
 - Support, protection and nutrition of the developing spermatogenic cells
 - Exocrine and endocrine secretion
 - Exocrine
 - Secretion stimulated by FSH