

Why invest in reproductive health?

LONG-TERM BENEFITS

Women who are able to plan their births...





are better able to complete their education



participate more fully in the labor force



have increased productivity and earnings



enjoy higher household savings and assets

Learning Objectives

01

Describe spermatogenes is.

02

Describe the functions of prostate gland and composition of semen

03

Describe the overview of female reproductive system.

The Reproductive System

- the gonads
- reproductive tract
- oaccessory sex glands differ in males and females
- External genitilia

The Primary Reproductive Organs - Gonads

- Testes in the male
- Ovaries in the female
- the dual function of
- gametes spermatozoa (sperm) male and ova (eggs) female
- 2. sex hormones testosterone in males and oestrogen and progesterone in females

The Secondary Sexual Characteristics

Male	Female
Broader shoulders	Curvier hips
Hair distribution - beards	Less body hair, Soft skin
Testosterone	Estrogens and progesterone
Penis, scrotum	Breasts, labia

Sexual Differentiation

Wolffian ducts and Mullerian ducts develop in all embryos

- Male reproductive tract → Wolffian ducts & Mullerian ducts degenerate
- ► Female Müllerian ducts → reproductive tract and the Wolffian ducts regress

the early embryo -> either a male or a female reproductive tract

2 Hormones secreted in Males

Testosterone & Mullerian Inhibiting Hormone

Females No such hormones

Male Reproductive System

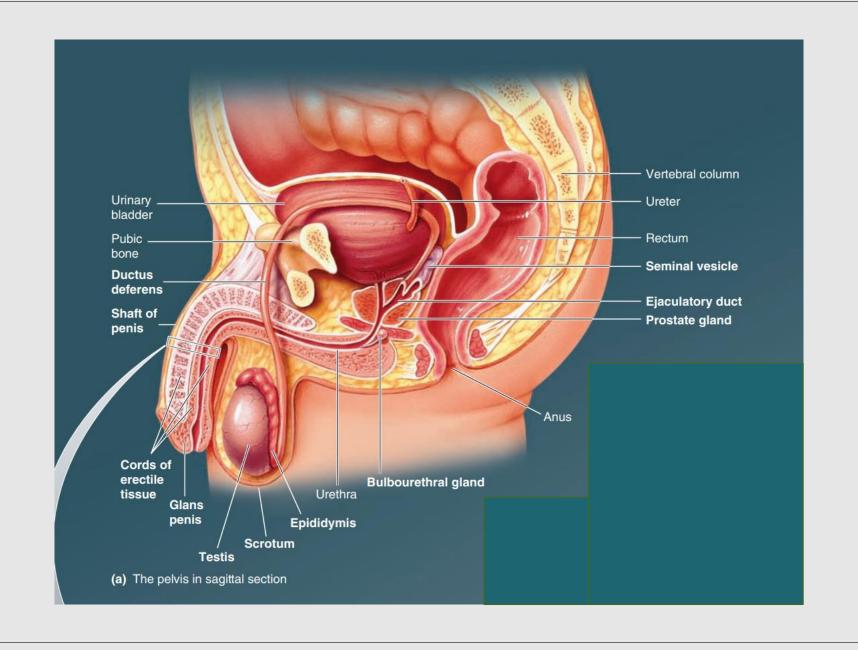
Functions

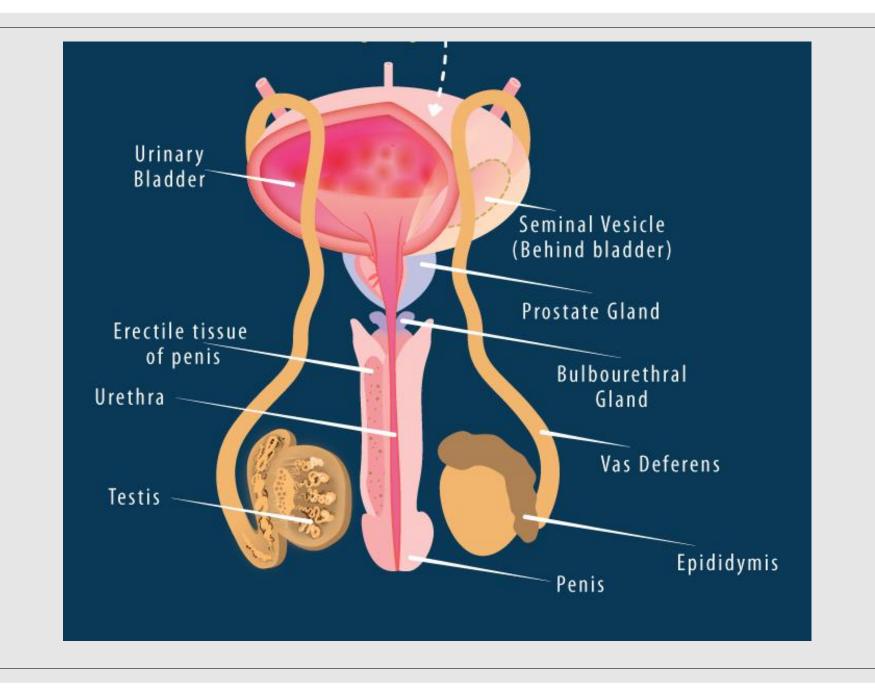
• 1. Production of sperm (spermatogenesis)

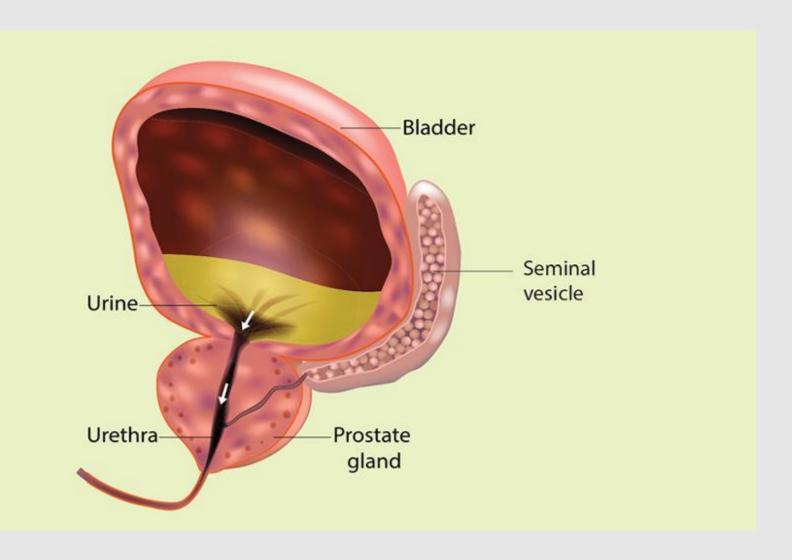
2. Delivery of sperm to the female

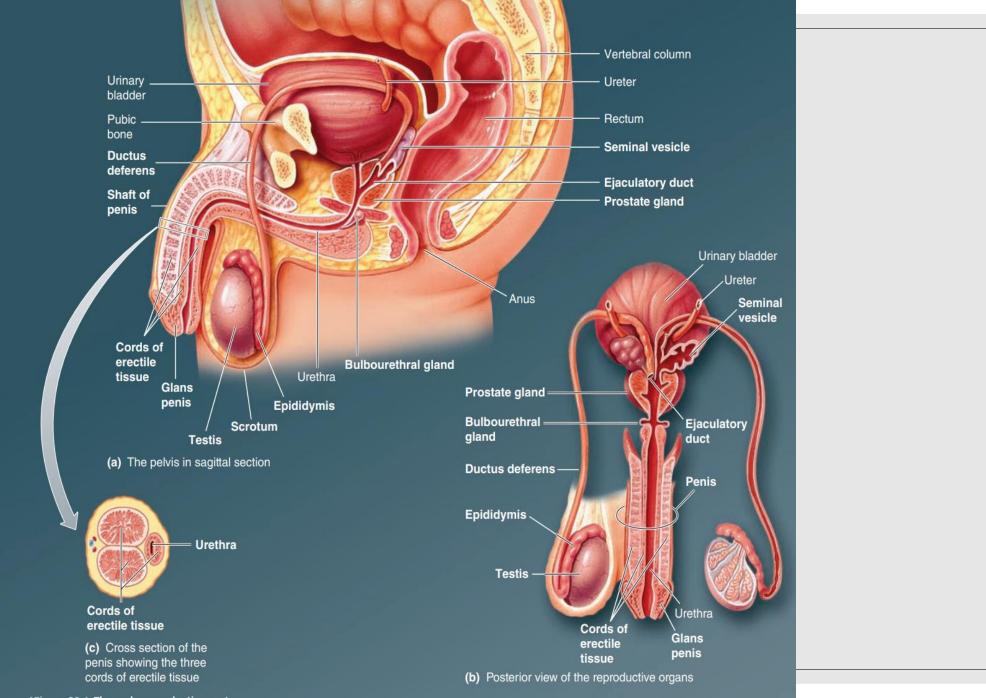
Components

- Testes in scrotum
- Semen
- Male accessory sex glands secretions make the bulk of the semen are
- 1. seminal vesicles
- 2. prostate gland
- 3. bulbourethral gland(Cowper's)
- Penis and glans penis

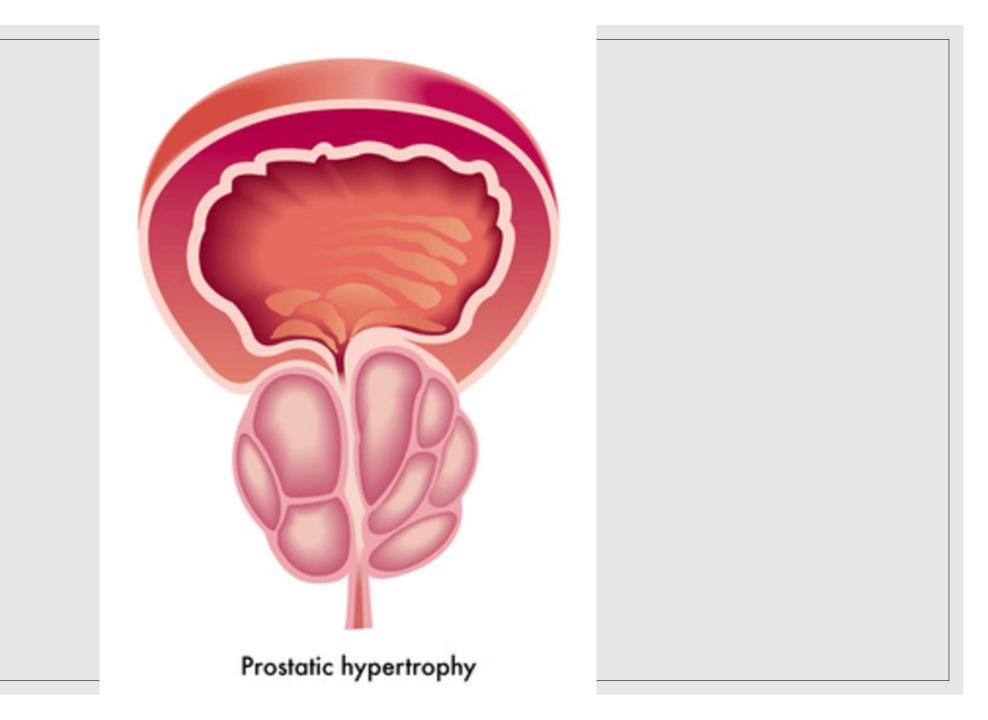


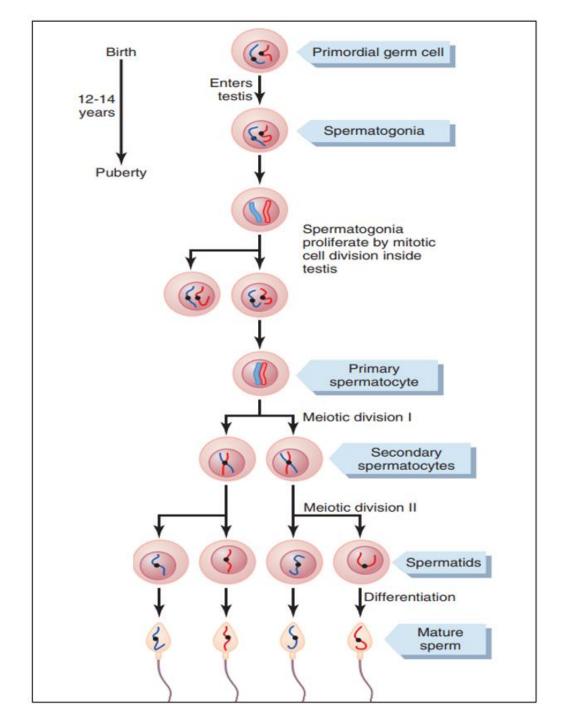






IFigure 20-1 The male reproductive system.





Spermatogenesis

Functions of Prostate Gland

Secretes a thin, milky alkaline fluid that contains

Calcium

Citrate Ion

Phosphate Ion

Clotting Enzyme

Profibrinolysin

Composition of Semen

Composition of healthy human semen

Approx 5%	Sperm produced in the seminiferous tubules and stored in the cauda epididymis
Less than 5%	Clear mucus produced by the Cowper (bulbourethral) glands
50-65%	Fluid from the seminal vesicles, including fructose (sugar that "feeds" the sperm), prostaglandins, and ascorbic acid
20-30%	Fluid from the prostate gland, including zinc, amino acids, and lipids (fats and cholesterols)

SOURCE: LAWRENTSCHUK ET AL, 2016.

Composition of Semen

Color: White, opalescent Specific gravity: 1.028 pH: 7.35-7.50 Sperm count: Average about 100 million/mL, with fewer than 20% abnormal forms Other components: Fructose (1.5-6.5 mg/mL) Phosphorylcholine From seminal vesicles Ergothioneine (contributes 60% of total volume) Ascorbic acid Flavins Prostaglandins Spermine Citric acid Cholesterol, phospholipids From prostate (contributes 20% of total volume) Fibrinolysin, fibrinogenase Zinc Acid phosphatase Phosphate **Buffers Bicarbonate** Hyaluronidase

FEMALE REPRODUCTIVE SYSTEM

Functions of Female Reproductive System

Two Phases

- 1. Preparation of female body for conception & pregnancy
 - 2. The period of pregnancy itself

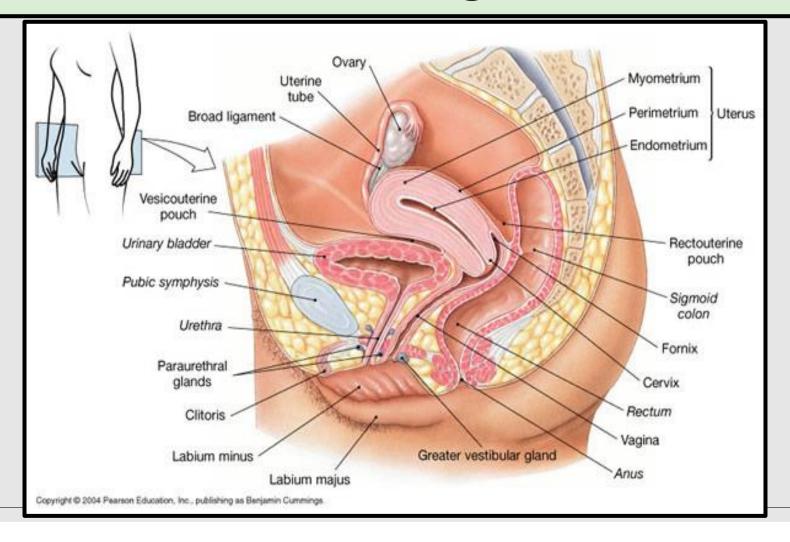
Functions of Female Reproductive System

- Production of ova
- Reception of Sperm
- Fertilization and Conception
- Maintenance of Developing Fetus (Gestation or Pregnancy)
 - Formation of Placenta
 - Giving Birth to the baby
 - Lactation

Principal organs of the human female reproductive tract include

- 1. Ovaries
- 2. Fallopian tubes (also called uterine tubes)
 - 3. Uterus
 - 4. Vagina

Physiological Anatomy of Female Sexual Organs



Female Reproductive System

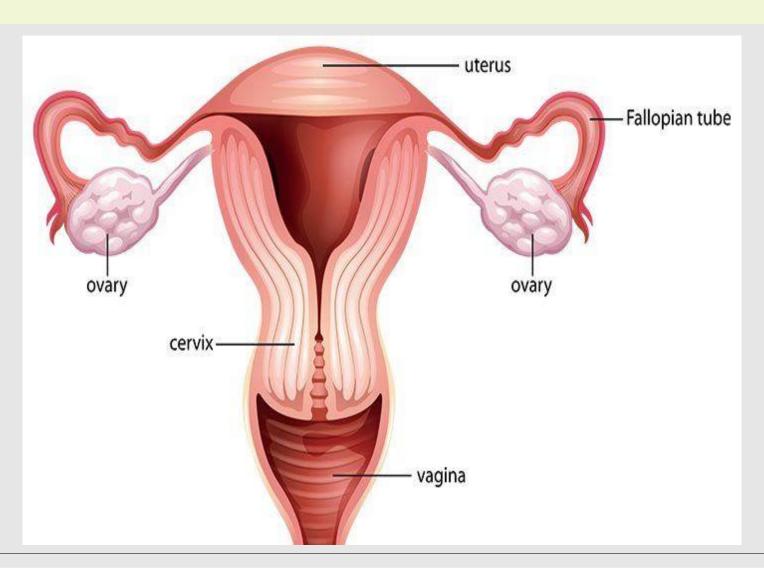
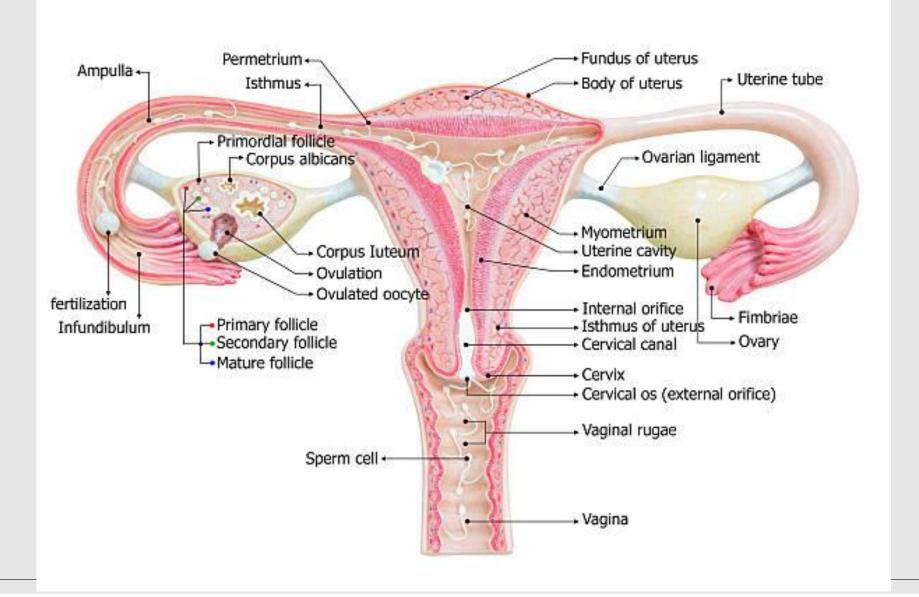
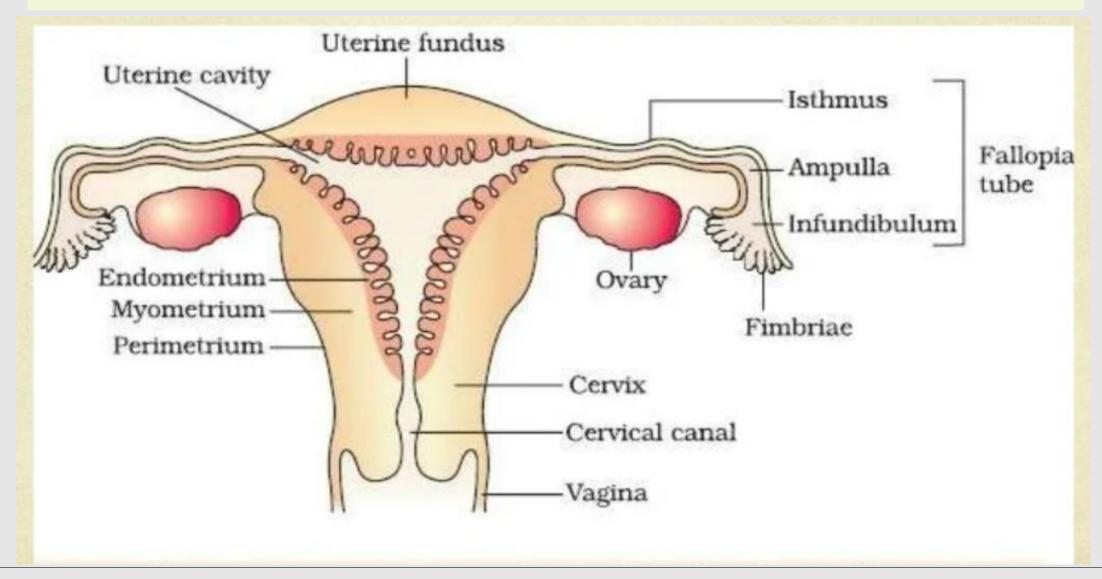
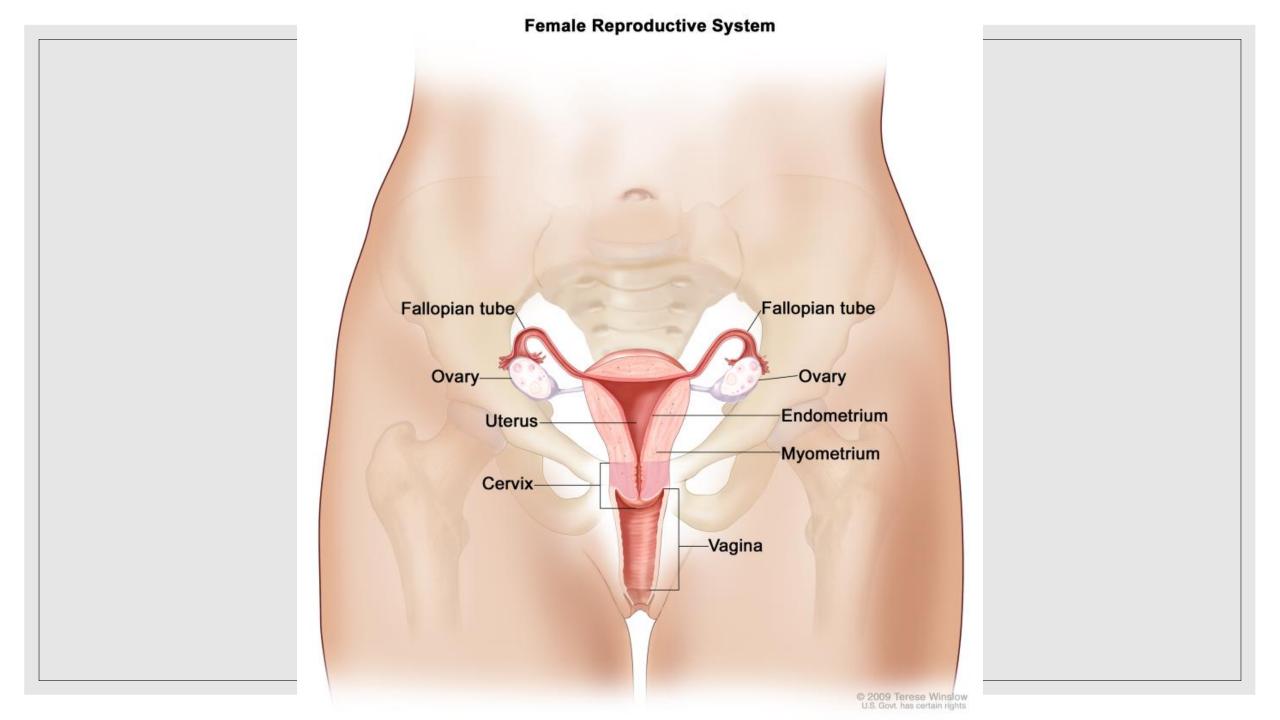


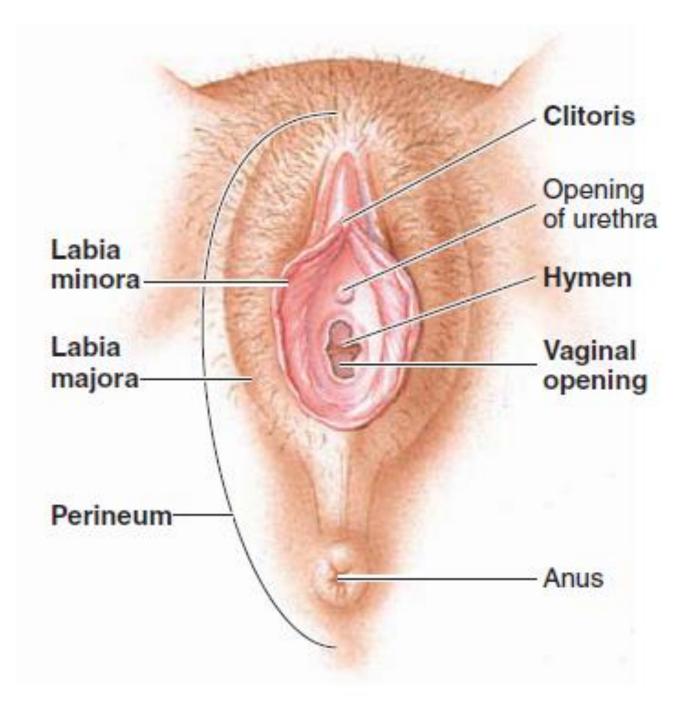
Diagram of Female Reproductive System



Female Reproductive System







Perineal
View of
External
Genitalia

Reproduction begins with the development of ova in the ovaries

In each monthly sexual cycle, an ovum is expelled from an ovarian follicle into the abdominal cavity

passes through one of the fallopian tubes into the uterus

If fertilized, it implants in the uterus and
into a fetus, a placenta, fetal membranes and a baby

Oogenesis and Follicular Development in the Ovaries

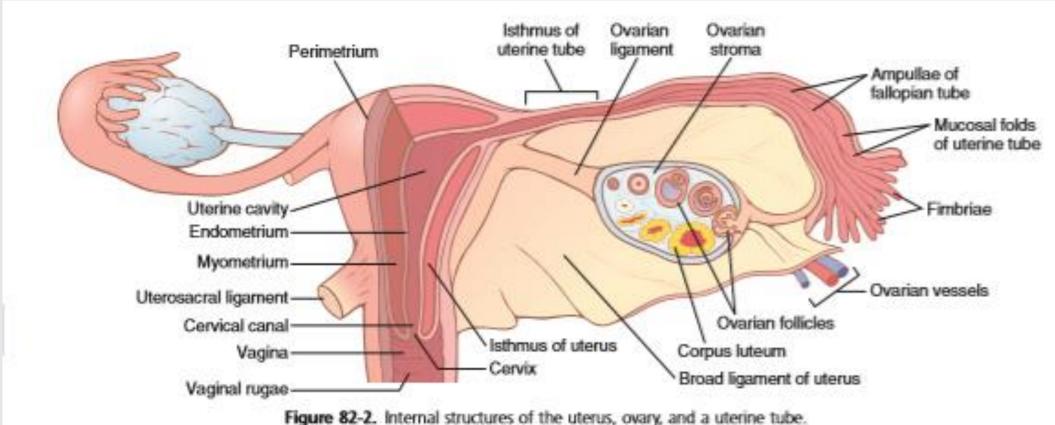


Figure 82-2. Internal structures of the uterus, ovary, and a uterine tube.

Oogenesis & Follicular Development

Developing egg/oocyte → mature egg/ovum

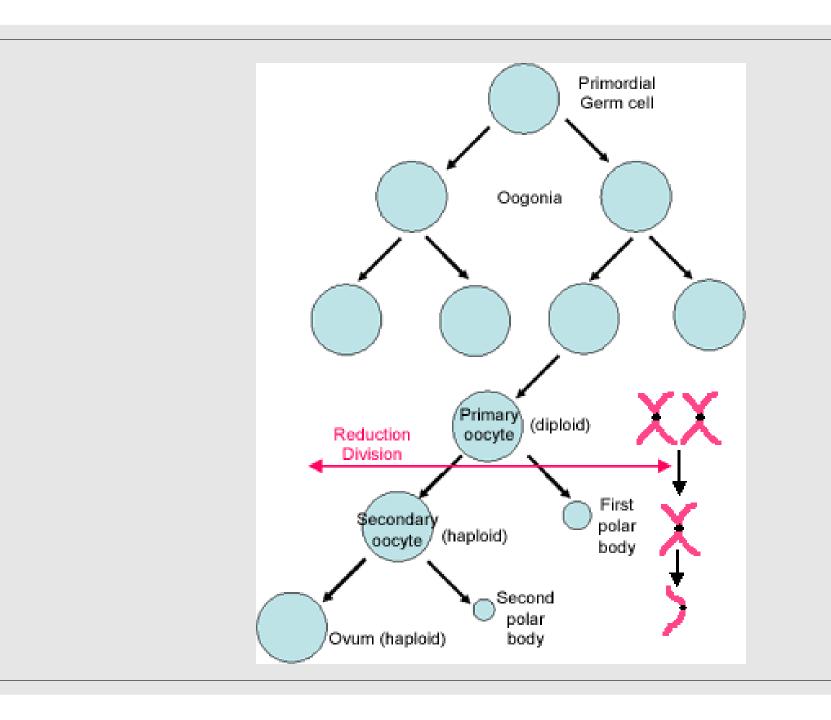
This process is called oogenesis

Primordial germ cell

Oogonia/ Primordial Ova Primordial
Follicle/
Primary
oocyte
5th month of fetal life

Oocyte →
Secondary oocyte
(Ovum) + first polar
body
Puberty

Ovum undergoes second meiotic division



Oogenesis & Follicular Development

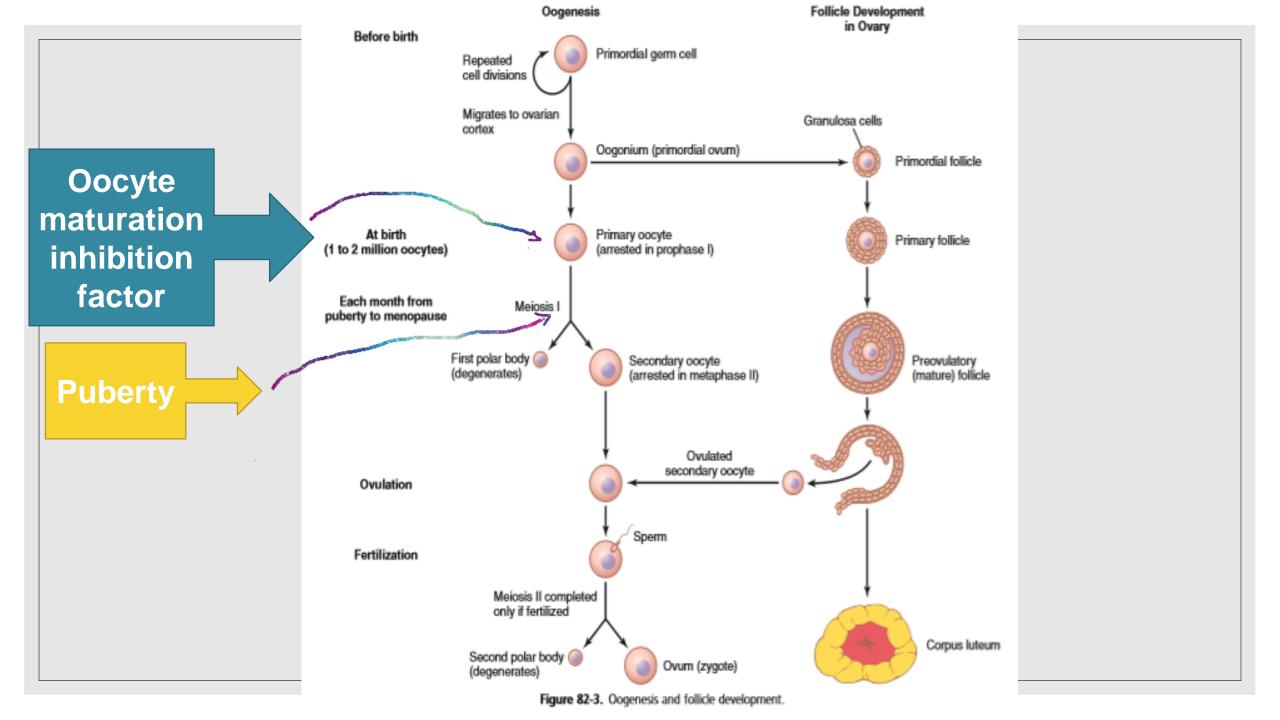
At birth, 1 – 2 million primary oocytes – 2 divisions before fertilization

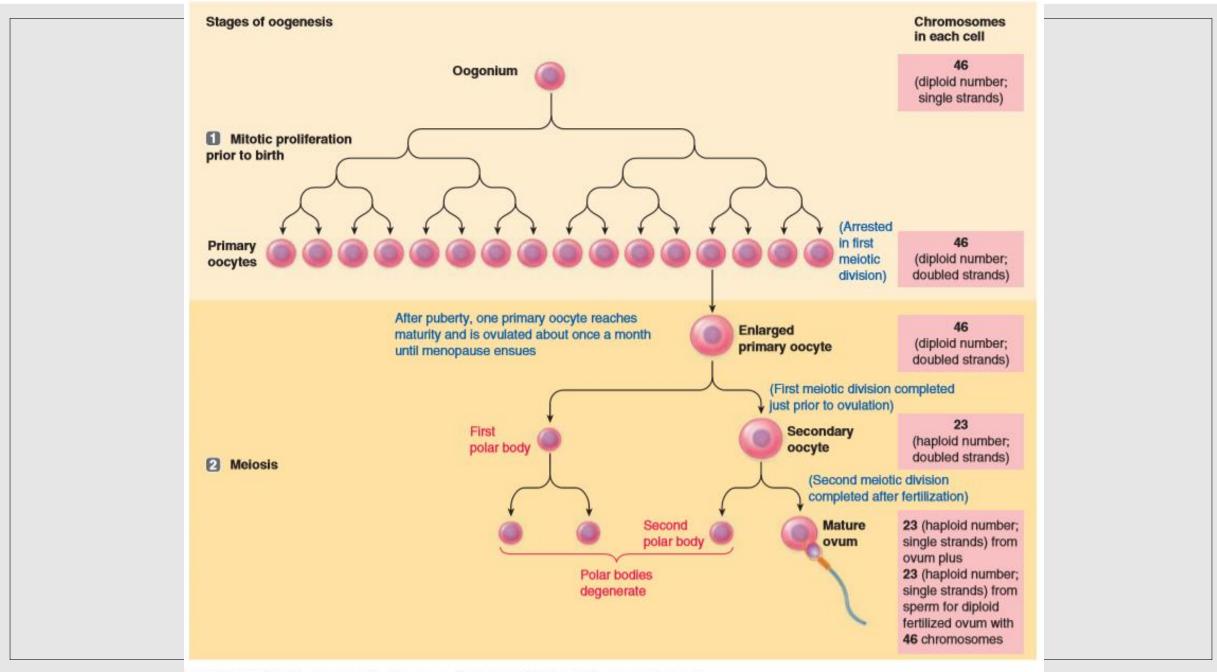
First meiotic division - after puberty → secondary oocyte (23n) + first polar body (23n)

Ovum \rightarrow a second meiotic division and after the sister chromatids separate there is a pause in meiosis

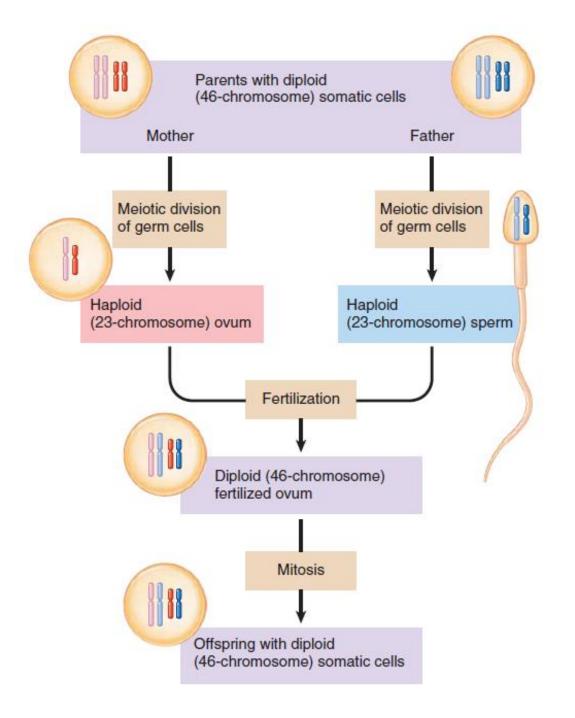
When ovary releases ovum during ovulation and sperm enters the ovum final meiosis occurs

At puberty about 300,000 oocytes remain in ovaries and only a small percentage become mature





• FIGURE 20-14 Oogenesis. Compare with • Figure 20-8, p. 753, spermatogenesis.



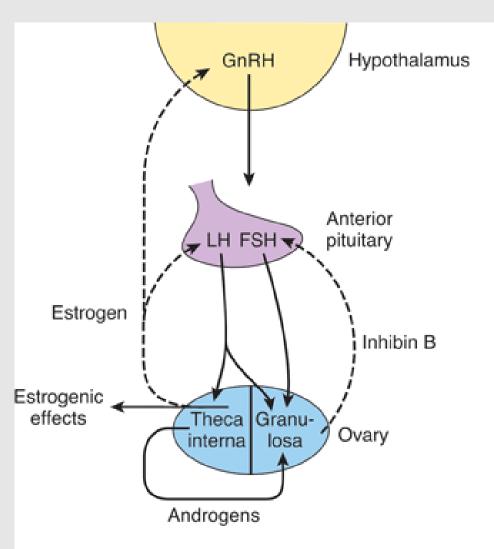
Chromosomal Distribution in Sexual Reproduction

Female Reproductive Hormones A hypothalamic releasing hormone- **Gonadotropin-releasing** hormone (GnRH)

The anterior pituitary

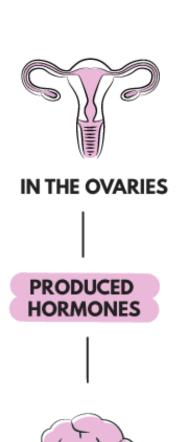
follicle-stimulating hormone (FSH) and luteinizing hormone (LH)

The ovarian hormones- **Estrogen** and **Progesterone**



Source: Barrett KE, Barman SM, Boitano S, Brooks H: Ganong's Review of Medical Physiology, 23rd Edition: http://www.accessmedicine.com

Copyright @ The McGraw-Hill Companies, Inc. All rights reserved.



IN THE BRAIN



ESTROGENS

IMPORTANT ROLE IN SEXUAL & REPRODUCTIVE DEVELOPMENT



PROGESTERONE

FACILITATES THE IMPLANTATION OF THE FERTILIZED EGG



LH

FACILITATES OVULATION



FSH

STIMULATES FOLLICULAR PRODUCTION

PREMENSTRUAL SYNDROME

PMS

Premenstrual Syndrome

 affects emotions, physical health, and behavior during menstrual cycle usually just before menses

 symptoms start 5 to 11 days before menstruation and typically go away once menstruation begins

Cause of PMS is unknown

Causes of Premenstrual Syndrome

 a change in both sex hormone and serotonin levels at the beginning of the menstrual cycle

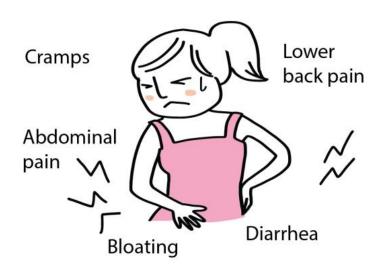
 ○↑ estrogen, progesterone & ovarian steroids can cause mood swings, irritability and anxiety

Serotonin levels (↓) affect mood

https://www.mayoclinic.org/diseases-conditions/premenstrual-syndrome/symptoms-causes/syc-20376780

PMS symptoms

Premenstrual Syndrome









Effects on the Body Premenstrual Syndrome (PMS) mood swings headaches fatigue poor sleep difficulty concentrating low mood increased anxiety crying easily acne oily skin tender or swollen breasts food cravings abdominal bloating menstrual cramps constipation diarrhea decreased libido









Any questions

References

- Guyton and Hall
- Sherwood Physiology
- Ganong's Physiology



shutterstock.com · 251280265

