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Reproductive System

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PRIORITY CONCEPTS Reproduction, Sexuality

I. Reproductive Structures and Functions

- A. Ovaries
 - 1. Form and expel ova
 - 2. Secrete estrogen and progesterone
- B. Fallopian tubes
 - 1. Muscular tubes (oviducts) lying near the ovaries and connected to the **uterus**
 - 2. Tubes that propel the ova from the ovaries to the uterus
- C. Uterus
 - 1. Muscular, pear-shaped cavity in which the fetus develops
 - 2. Cavity from which menstruation occurs
- D. Cervix
 - 1. The internal os of the cervix opens into the body of the uterine cavity.
 - 2. The cervical canal is located between the internal os and the external os.
 - 3. The external cervical os opens into the vagina.
 - 4. It is a passageway sperm can travel through to fertilize eggs.
- E. **Vagina**
 - 1. Muscular tube that extends from the cervix to the vaginal opening in the perineum that is approximately 3 to 4 in (7.6 to 10 cm) long
 - 2. Known as the *birth canal*
 - 3. Passageway for menstrual **blood** flow, for penis for intercourse, and for the fetus
- F. Penis
 - 1. Structures include the body or shaft, glans penis, and urethra.
 - 2. Primary functions include pathway for urination, ejaculation, and the organ used for intercourse.
- G. Scrotum
 - 1. Houses structures including the testes, epididymis, and vas deferens

- 2. Normal temperature is slightly cooler than body temperature.

- H. Prostate gland
 - 1. Secretes a milky alkaline fluid that forms part of semen
 - 2. This milky alkaline fluid enhances sperm movement and neutralizes acidic vaginal secretions.

II. Menstrual Cycle (Box 21.1)

- A. Ovarian hormones
 - 1. Ovarian hormones, released by the anterior pituitary gland, include follicle-stimulating hormone (FSH) and luteinizing hormone (LH).
 - 2. The hormones produce changes in the ovaries and in the endometrium.
 - 3. The menstrual cycle, the regularly recurring physiological changes in the endometrium that culminate in its shedding, may vary in length, with the average length being about 28 days.
- B. Ovarian and uterine phases (Box 21.1)

III. Pelvis and Measurements

- A. True pelvis
 - 1. Lies below the pelvic brim
 - 2. Consists of the pelvic inlet, midpelvis, and pelvic outlet
- B. False pelvis
 - 1. The shallow portion above the pelvic brim
 - 2. Supports the abdominal viscera
- C. Types of pelvis
 - 1. Gynecoid
 - a. Normal pelvis
 - b. Transversely rounded or blunt



The gynecoid pelvis is most favorable for successful labor and birth. If cephalopelvic disproportion (CPD) exists, the normal labor process cannot progress and will most likely result in a cesarean delivery.



BOX 21.1 Menstrual Cycle**Ovarian Changes****Preovulatory Phase**

Hypothalamus releases gonadotropin-releasing hormone through the portal system to the anterior pituitary system. Secretion of follicle-stimulating hormone (FSH) by the anterior lobe of the pituitary gland stimulates growth of follicles. Most follicles die, leaving one to mature into a large graafian follicle. Estrogen produced by the follicle stimulates increased secretions of luteinizing hormone (LH) by the anterior lobe of the pituitary gland. The follicle ruptures and releases an ovum into the peritoneal cavity.

Luteal Phase

Begins with ovulation
Body temperature decreases and then increases by 0.5° F to 1° F around the time of ovulation.
Corpus luteum is formed from follicle cells that remain in the ovary after ovulation.
Corpus luteum secretes estrogen and progesterone during the remaining 12 to 14 days of the cycle.
Corpus luteum degenerates if the ovum is not fertilized, and secretion of estrogen and progesterone declines.
Decline of estrogen and progesterone stimulates the anterior pituitary to secrete more FSH and LH, initiating a new reproductive cycle.

Uterine Changes**Menstrual Phase**

Consists of 4 to 6 days of bleeding as the endometrium breaks down because of the decreased levels of estrogen and progesterone
The level of FSH increases, enabling the beginning of a new cycle.

Proliferative Phase

Lasts about 9 days
Estrogen stimulates proliferation and growth of the endometrium.
As estrogen increases, it suppresses secretion of FSH and increases secretion of LH.
Secretion of LH stimulates ovulation and the development of the corpus luteum.
Ovulation occurs between days 12 and 16.
Estrogen level is high, and progesterone level is low.

Secretory Phase

Lasts about 12 days and follows ovulation
This phase is initiated in response to the increase in LH level.
The graafian follicle is replaced by the corpus luteum.
The corpus luteum secretes progesterone and estrogen.
Progesterone prepares the endometrium for pregnancy if a fertilized ovum is implanted.

Data from Lewis, S., Harding, M., Kwong, J., Roberts, D., Hagler, D., & Reinisch, C. (2020). *Medical-surgical nursing: Assessment and management of clinical problems*. (11th ed.). St. Louis: Mosby. pp. 1176-1177; Murray, S., McKinney, E., Holub, K., & Jones, R. (2019). *Foundations of maternal-newborn and women's health nursing*. (7th ed.). St. Louis: Elsevier. p. 55.

2. Anthropoid
 - a. Oval shape
 - b. Adequate outlet, with a narrow pubic arch
 3. Android
 - a. Heart-shaped or angulated
 - b. Not favorable for labor and vaginal birth
 - c. Narrow pelvic planes can cause slow descent and midpelvic arrest.
 4. Platypelloid
 - a. Flat with an oval inlet
 - b. Wide transverse diameter, but short anteroposterior diameter, making labor and vaginal birth difficult
 - D. Pelvic inlet diameters
 1. Anteroposterior diameters
 - a. Diagonal conjugate: Distance from the lower margin of the symphysis pubis to the sacral promontory
 - b. True conjugate or conjugate vera: Distance from the upper margin of the symphysis pubis to the sacral promontory
 - c. Obstetric conjugate: Extends from the sacral promontory to the top of the symphysis pubis. It is the smallest front-to-back distance through which the fetal head must pass in moving through the pelvic inlet.
 2. Transverse diameter: The largest of the pelvic inlet diameters; located at right angles to the true conjugate
 3. Oblique (diagonal) diameter: Not clinically measurable
 4. Posterior sagittal diameter: Distance from the point where the anteroposterior and transverse diameters cross each other to the middle of the sacral promontory
 - E. Pelvic midplane diameters
 1. Transverse (interspinous diameter)
 2. Midplane normally is the largest plane and has the longest diameter.
 - F. Pelvic outlet diameters
 1. Transverse (intertuberous diameter)
 2. Outlet presents the smallest plane of the pelvic canal.
- IV. Fertilization and Implantation**
- A. Fertilization**
1. Fertilization occurs in the ampulla of the fallopian (uterine) tube when sperm and ovum unite.
 2. Fertilization usually takes place within the outer third of the fallopian tubes. An ovum can be fertilized up to 72 hours after its release.



BOX 21.2 Fetal Development**Preembryonic Period**

First 2 weeks after conception

Embryonic Period

Beginning day 15 through approximately week 8 after conception

Fetal Period

Week 9 after conception to birth

Week 1

Blastocyst is free-floating.

Weeks 2 to 3

Embryo is 1.5 to 2 mm in length.

Lung buds appear.

Blood circulation begins.

Heart is tubular and begins to beat.

Neural plate becomes brain and spinal cord.

Week 5

Embryo is 0.4 to 0.5 cm in length.

Embryo is 0.4 g.

Double heart chambers are visible.

Heart is beating.

Limb buds form.

Week 8

Embryo is 3 cm in length.

Embryo is 2 g.

Eyelids begin to fuse.

Circulatory system through umbilical cord is well established.

Taste buds begin to develop.

Lips are fused.

Every organ system is present.

Week 12

Fetus is 6 to 9 cm in length.

Fetus is 19 g.

Face is well formed.

Limbs are long and slender.

Kidneys begin to form urine.

Spontaneous movements occur.

Sucking reflex is present.

Heartbeat is detected by Doppler transducer between 10 and 12 weeks.

Week 16

Fetus is 11.5 to 13.5 cm in length.

Fetus is 100 g.

Active movements are present.

Fetal skin is transparent.

Lanugo hair begins to develop.

Skeletal ossification occurs.

Fingerprints are developing.

Fetus swallows amniotic fluid.

Sex of fetus is visually recognizable on ultrasound.

Week 20

Fetus is 16 to 18.5 cm in length.

Fetus is 300 g.

Lanugo covers the entire body.

Fetus has nails.

Muscles are developed.

Enamel and dentin are depositing.

Myelination of nerves begins.

Heartbeat is detected by regular (nonelectronic) fetoscope.

Week 24

Fetus is 23 cm in length.

Fetus is 600 g.

Hair on head is well formed.

Skin is reddish and wrinkled.

Reflex hand grasp functions are present.

Vernix caseosa covers entire body.

Fetus has ability to hear.

Surfactant levels begin to increase.

Week 28

Fetus is 27 cm in length.

Fetus is 1100 to 1300 g.

Limbs are well flexed.

Brain is developing rapidly.

Eyelids open and close.

Lungs are developed sufficiently to provide gas exchange (lecithin forming).

If born, neonate can breathe at this time.

Week 32

Fetus is 31 cm in length.

Fetus is 1800 to 2100 g.

Bones are fully developed.

Subcutaneous fat has collected.

Lecithin-to-sphingomyelin (L/S) ratio is 1.2:1.

Week 36

Fetus is 35 cm in length.

Fetus is 2200 to 2900 g.

Skin is pink and body is rounded.

Skin is less wrinkled.

Lanugo is disappearing.

L/S ratio is greater than 2:1.

Lungs are considered mature.

Week 40

Fetus is 40 cm in length.

Fetus is more than 3200 g.

Skin is pinkish and smooth.

Lanugo may be present on upper arms and shoulders.

Vernix caseosa decreases.

Fingernails extend beyond fingertips.

Sole (plantar) creases run down to the heel. At 40 weeks creases cover only two-thirds of the foot; the entire sole is covered with creases after 41 weeks.

Testes are in the scrotum.

Labia majora are well developed.

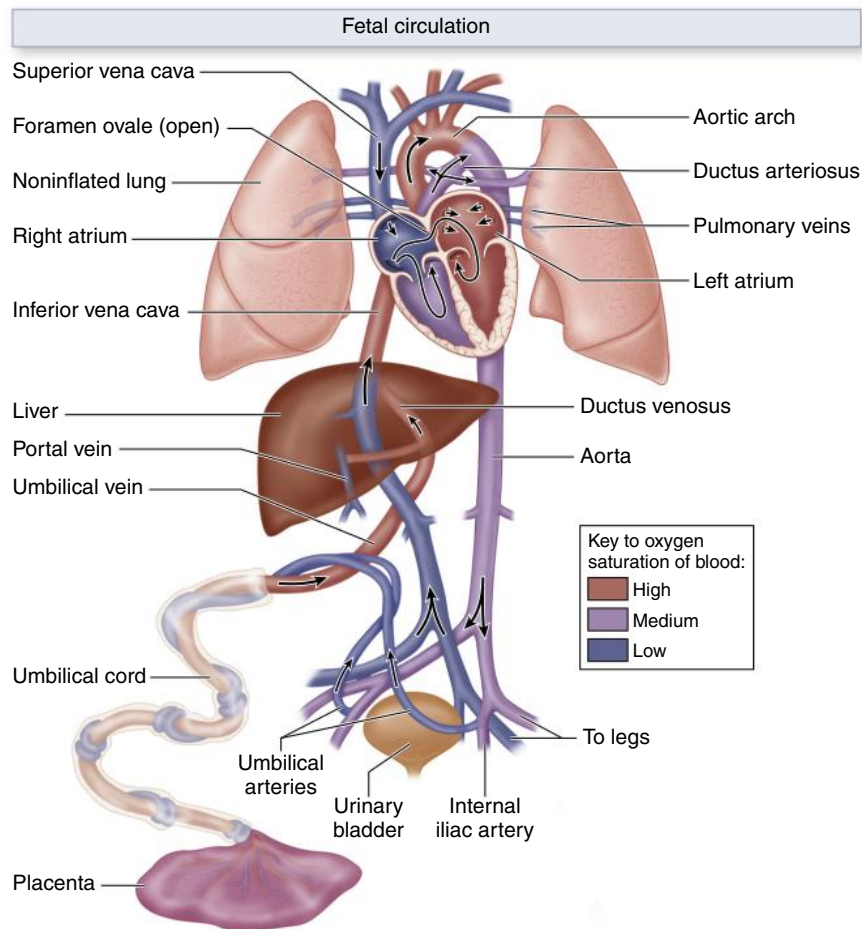


FIG. 21.1 Fetal circulation. Three shunts (ductus venosus, ductus arteriosus, and foramen ovale) allow most blood from the placenta to bypass the fetal lungs and liver.

B. Birth control

1. The focus of counseling on contraception must meet the needs and feelings of each partner.
2. Several factors should be considered when choosing a method of birth control, including effectiveness, safety, and personal preference.
3. The woman's preferences are most important, and cultural practices or religious or other personal beliefs may affect the choice of contraceptives.
4. Other factors that bear on the selection of a contraceptive method include family planning goals, age, frequency of intercourse, and the individual's capacity to adhere to the prescribed regimen.
5. If family planning goals have already been met, sterilization of either partner may be desirable (it is important for the couple to understand that tubal reconstruction may be unsuccessful).
6. For those who frequently engage in coitus, oral contraceptives or a long-term method such as implants or an intrauterine device (IUD) may be considered.

7. When sexual activity is limited, the use of spermicide, condoms, or a diaphragm may be most appropriate.
8. Because some methods have adverse effects, a signed informed consent form may be needed.
9. For additional information on the use of contraceptives, see [Chapter 29](#).

C. Infertility

1. Infertility is the inability to conceive when desired.
2. Some factors contributing to infertility in men include abnormalities of the sperm, abnormal erections or ejaculations, or abnormalities of the seminal fluid.
3. Some factors that contribute to infertility include disorders of ovulation, abnormalities of the fallopian tubes or cervix, or scarring from previous uterine or fallopian tube infections.
4. Several diagnostic tests are available to determine the probable cause of infertility, and the therapy recommended may depend on the cause of the infertility.



5. Infertility options
 - a. Options include medication, surgical procedures, and artificial insemination.
 - b. Other therapies are available, such as in vitro fertilization, surrogate mothers, and embryo hosts.
 - c. Adoption may also be an option.
6. The nurse needs to provide support to the couple in their decision-making process and during therapy.

PRACTICE QUESTIONS

1. The nurse is preparing to teach a prenatal class about fetal circulation. Which statements would be included in the teaching plan? **Select all that apply.**
 - ☐ 1. "The ductus arteriosus allows blood to bypass the fetal lungs."
 - ☐ 2. "One vein carries oxygenated blood from the placenta to the fetus."
 - ☐ 3. "The normal fetal heartbeat range is 160 to 180 beats per minute in pregnancy."
 - ☐ 4. "Two arteries carry deoxygenated blood and waste products away from the fetus to the placenta."
 - ☐ 5. "Two veins carry blood that is high in carbon dioxide and other waste products away from the fetus to the placenta."
2. The nursing instructor teaches a group of students about fetal circulation and then asks a student to describe fetal circulation, specifically the ductus venosus. Which statement by the student indicates an understanding of the ductus venosus?
 1. "It connects the pulmonary artery to the aorta."
 2. "It is an opening between the right and left atria."
 3. "It connects the umbilical vein to the inferior vena cava."
 4. "It connects the umbilical artery to the inferior vena cava."
3. A pregnant client tells the clinic nurse that they want to know the sex of the baby as soon as it can be determined. The nurse plans to inform the client that they will be able to find out the sex at 16 weeks' gestation because of which factor?
 1. The appearance of the fetal external genitalia
 2. The beginning of differentiation in the fetal groin
 3. The fetal testes are descended into the scrotal sac.
 4. The internal differences in different genders become apparent.
4. The nurse is performing an assessment on a client who is at 38 weeks' gestation and notes that the fetal heart rate (FHR) is 174 beats per minute. On the basis of this finding, what is the **priority** nursing action?
 1. Document the finding.
 2. Notify the obstetrician (OB).
 3. Check the mother's heart rate.
 4. Tell the client that the fetal heart rate is normal.
5. The nurse is conducting a prenatal class on the reproductive system. When a client in the class asks why the fertilized ovum stays in the fallopian tube for 3 days, what is the nurse's **best** response?
 1. "It promotes the fertilized ovum's chances of survival."
 2. "It promotes the fertilized ovum's exposure to estrogen and progesterone."
 3. "It promotes the fertilized ovum's normal implantation in the top portion of the uterus."
 4. "It promotes the fertilized ovum's exposure to luteinizing hormone and follicle-stimulating hormone."
6. The nursing instructor asks a nursing student to explain the characteristics of the amniotic fluid. The student responds correctly by explaining which as characteristics of amniotic fluid? **Select all that apply.**
 - ☐ 1. Allows for fetal movement
 - ☐ 2. Surrounds, cushions, and protects the fetus
 - ☐ 3. Maintains the body temperature of the fetus
 - ☐ 4. Can be used to measure fetal kidney function
 - ☐ 5. Prevents large particles such as bacteria from passing to the fetus
 - ☐ 6. Provides an exchange of nutrients and waste products between the birthing parent and the fetus
7. A couple comes to the family planning clinic and asks about sterilization procedures. Which question by the nurse would determine whether this method of family planning would be **most appropriate**?
 1. "Have you ever had surgery?"
 2. "Do you plan to have any other children?"
 3. "Do either of you have diabetes mellitus?"
 4. "Do either of you have problems with high blood pressure?"
8. The nurse would plan to make which statement to a pregnant client found to have a gynecoid pelvis?
 1. "Your type of pelvis has a narrow pubic arch."
 2. "Your type of pelvis is the most favorable for labor and birth."
 3. "Your type of pelvis is a wide pelvis, but it has a short diameter."
 4. "You will need a cesarean section because this type of pelvis is not favorable for a vaginal delivery."