

Chapter 2—Assisted Reproductive Technology

MULTIPLE CHOICE

1. The process of ____ results in the formation of eggs.
- oogenesis
 - implantation
 - mitosis
 - spermatogenesis
 - fertilization

ANS: A PTS: 1 DIF: Easy REF: p. 36

2. Which of the following statements is **FALSE** about female reproduction?
- Fallopian tubes have fingerlike projections.
 - Fertilization occurs most often in the fallopian tubes.
 - Fallopian tubes are part of the uterus.
 - Oogenesis produces eggs in the ovaries.
 - Females have a pair of ovaries.

ANS: C PTS: 1 DIF: Moderate REF: p. 36

3. What is the role of the uterus?
- It produces eggs.
 - It serves as the birth canal.
 - It holds the embryo and the fetus during pregnancy.
 - It facilitates egg movement through the fallopian tubes.
 - It connects the fallopian tubes and the ovaries.

ANS: C PTS: 1 DIF: Easy REF: p. 36

4. Which of the following is **NOT** part of the male reproductive system?
- testes
 - urethra
 - epididymis
 - cervix
 - vas deferens

ANS: D PTS: 1 DIF: Easy REF: p. 34-35

5. Which of the following is **NOT** part of the female reproductive system?
- ovaries
 - urethra
 - fallopian tubes
 - uterus
 - cervix

ANS: B PTS: 1 DIF: Easy REF: p. 35-36

6. Where does egg production occur in females?
- a. In the fallopian tubes.
 - b. In the endometrium of the uterus.
 - c. In the ovaries.
 - d. In the myometrium of the uterus.
 - e. In the vagina.

ANS: C PTS: 1 DIF: Easy REF: p. 36

7. Which of the following is not a possible cause of infertility in women?
- a. blockage of the fallopian tubes
 - b. high levels of estrogen
 - c. damaged ovaries
 - d. premature menopause
 - e. All of these are possible causes of infertility in women.

ANS: B PTS: 1 DIF: Moderate REF: p. 38

8. Which of the following is true for secondary amenorrhea?
- a. It can be caused by obesity.
 - b. It can be caused by excessive physical conditioning.
 - c. It can be caused by endometriosis.
 - d. It can cause an increased risk of miscarriages.
 - e. It can be caused by lack of physical conditioning.

ANS: B PTS: 1 DIF: Moderate REF: p. 38

9. What is the most common cause of infertility in females?
- a. hormone imbalance
 - b. blocked fallopian tubes
 - c. damaged ovaries
 - d. endometriosis
 - e. obesity

ANS: A PTS: 1 DIF: Easy REF: p. 38

10. Which of the following can lead to blockage of the fallopian tubes?
- a. appendicitis
 - b. bowel problems
 - c. scar tissue following surgery
 - d. viral infections
 - e. All of these can lead to blockage of the fallopian tubes.

ANS: E PTS: 1 DIF: Easy REF: p. 38

11. Which of the following statements is **FALSE**?
- a. Ovaries contain several hundred follicles.
 - b. If fertilization does not occur, the endometrium is shed.
 - c. Secondary oocytes are released from follicles during ovulation.
 - d. Oogonia begin meiosis after birth.
 - e. At birth a female has a lifetime supply of developing eggs.

ANS: D PTS: 1 DIF: Moderate REF: p. 38

12. An increase in this hormone level is measured by home ovulation tests.
- chorionic gonadotropin hormone
 - luteinizing hormone
 - estrogen
 - testosterone
 - None of these are measured by home ovulation tests.

ANS: B PTS: 1 DIF: Easy REF: p. 38

13. How does low sperm count in males result in infertility?
- It makes it difficult for the necessary number of sperm to reach the egg.
 - It hinders the ability of sperm to leave the male reproductive tract.
 - It leads to erectile dysfunction.
 - It leads to the production of sperm without tails.
 - None of these.

ANS: A PTS: 1 DIF: Easy REF: p. 39

14. Erectile dysfunction can be caused by all of following **EXCEPT**
- the penis getting too much blood.
 - emotional stress.
 - diabetes.
 - hormonal imbalance.
 - All of these are possible causes of erectile dysfunction.

ANS: A PTS: 1 DIF: Easy REF: p. 39

15. Causes of male infertility include all of the following **EXCEPT**
- no sperm formation.
 - impotence.
 - low sperm motility.
 - low sperm count.
 - endometriosis.

ANS: E PTS: 1 DIF: Easy REF: p. 39

16. All of the following can be causes of aspermia **EXCEPT**
- a vasectomy.
 - drug usage.
 - birth defects affecting the reproductive system.
 - lack of sexual intercourse.
 - All of these are possible causes of aspermia.

ANS: D PTS: 1 DIF: Easy REF: p. 31

17. What environmental influence(s) lead(s) to an increased risk of infertility and miscarriages?
- exposure to lead
 - exposure to ethylene oxide
 - exposure to excessive radiation
 - smoking
 - All of these lead to an increased risk.

ANS: E PTS: 1 DIF: Easy REF: p. 40

18. Which of the following is **NOT** a known factor for increased risk of infertility?
- the age of the mother
 - contraction of a sexually-transmitted disease
 - the age of the father
 - smoking cigarettes
 - exposure to some environmental factors

ANS: C PTS: 1 DIF: Moderate REF: p. 40

19. Which of the following is **FALSE**?
- Overweight females can have difficulty conceiving.
 - Smoking cigarettes lowers sperm count.
 - Smoking cigarettes increases the risk of miscarriage.
 - Women working on farms often have a harder time conceiving than women who do not.
 - The woman's age is unrelated to infertility.

ANS: E PTS: 1 DIF: Moderate REF: p. 39-40

20. Which of the following statements is **FALSE** about *in vitro* fertilization?
- Donor eggs can be used.
 - Donor sperm can be used.
 - Sperm or eggs of the couple themselves can be used.
 - Only donor eggs and donor sperm can be used.
 - Donor eggs, donor sperm, and/or the sperm or egg of the couple themselves can be used.

ANS: D PTS: 1 DIF: Moderate REF: p. 40-41

21. What is the most common reason that an infertile couple would choose surrogacy?
- The male does not produce sperm.
 - The woman cannot ovulate.
 - The couple would like to choose the sex of their child.
 - The male's sperm lack tails.
 - The woman's uterus is incapable of maintaining a pregnancy.

ANS: E PTS: 1 DIF: Moderate REF: p. 42

22. During spermatogenesis, these are the first cells that are haploid.
- spermatocytes
 - spermatids
 - sperm
 - spermatogonia
 - oocytes

ANS: B PTS: 1 DIF: Difficult REF: p. 35-36

23. Secretions from the seminal vesicles, prostate gland and bulbourethral gland are important for all of the following *except*
- assisting the movement of sperm through the female reproductive system.
 - acid neutralization.
 - lubrication during intercourse.
 - providing an energy source for the sperm.
 - increasing sperm production.

ANS: E PTS: 1 DIF: Moderate REF: p. 34-35

24. After a successful vasectomy,
- sperm production stops.
 - only secretions from the prostate gland will be found in the ejaculate.
 - the ejaculate will not contain sperm.
 - none of the glandular secretions will be found in the ejaculate.
 - there will be very few sperm present in the ejaculate.

ANS: C PTS: 1 DIF: Moderate REF: p. 35

25. Spermatogenesis occurs in the
- urethra.
 - seminiferous tubules.
 - epididymis.
 - seminal vesicles.
 - prostate gland.

ANS: B PTS: 1 DIF: Easy REF: p. 34

26. An egg will only complete meiosis immediately after _____ occurs.
- fertilization
 - ovulation
 - menstruation
 - menopause
 - formation of the secondary oocyte

ANS: A PTS: 1 DIF: Easy REF: p. 36

27. Which pairing is **INCORRECT**?
- epididymis - storage of sperm
 - seminiferous tubules - spermatogenesis
 - urethra - exit of sperm from body
 - vas deferens - sperm move through this
 - scrotum - secretions are part of semen

ANS: E PTS: 1 DIF: Moderate REF: p. 34-35

28. One example of this procedure combines a sperm sample and harvested eggs from the infertile couple in a lab dish. The embryos are placed in the woman's own uterus.
- in vitro* fertilization (IVF)
 - artificial insemination
 - surrogacy
 - intra-cytoplasmic sperm injection (ICSI)
 - gamete injection into the fallopian tube (GIFT)

ANS: A PTS: 1 DIF: Easy REF: p. 40-42

29. One example of this procedure involves injection of single sperm into harvested eggs. The embryos are placed in the woman's uterus.
- in vitro* fertilization (IVF)
 - artificial insemination
 - surrogacy
 - intra-cytoplasmic sperm injection (ICSI)
 - gamete injection into the fallopian tube (GIFT)

ANS: D PTS: 1 DIF: Moderate REF: p. 42-43

30. One example of this procedure combines a sperm sample and harvested eggs from the infertile couple in a lab dish. The embryos that result are then placed in another woman’s uterus.
- in vitro* fertilization (IVF)
 - artificial insemination
 - surrogacy
 - intra-cytoplasmic sperm injection (ICSI)
 - gamete injection into the fallopian tube (GIFT)

ANS: C PTS: 1 DIF: Moderate REF: p. 40-42

31. One example of this procedure combines a sperm sample and donated eggs in the woman’s fallopian tubes.
- in vitro* fertilization (IVF)
 - artificial insemination
 - surrogacy
 - intra-cytoplasmic sperm injection (ICSI)
 - gamete injection into the fallopian tube (GIFT)

ANS: E PTS: 1 DIF: Moderate REF: p. 44

32. This procedure places a sperm sample into the woman’s uterus.
- in vitro* fertilization (IVF)
 - artificial insemination
 - surrogacy
 - intra-cytoplasmic sperm injection (ICSI)
 - gamete injection into the fallopian tube (GIFT)

ANS: B PTS: 1 DIF: Easy REF: p. 40-41

TRUE/FALSE

1. Freezing donor eggs is a very successful and commonly used procedure.

ANS: F PTS: 1 DIF: Easy REF: p. 41

2. Spermatids lack tails.

ANS: T PTS: 1 DIF: Easy REF: p. 35

3. The action of the sperm entering the egg triggers the completion of meiosis of the egg.

ANS: T PTS: 1 DIF: Easy REF: p. 36

4. Sperm and eggs have half the number of chromosomes as normal cells of the body.

ANS: T PTS: 1 DIF: Easy REF: p. 35-36

5. If estrogen levels are low, ovulation will not be affected.

ANS: F PTS: 1 DIF: Moderate REF: p. 38

6. Hormonal problems in women account for about 75 percent of all cases where ovulation does not occur.

ANS: F PTS: 1 DIF: Easy REF: p. 38

7. Complete androgen insensitivity syndrome can lead to fertility problems in women.

ANS: T PTS: 1 DIF: Moderate REF: p. 38

8. Smoking cigarettes increases the chances of having a child.

ANS: F PTS: 1 DIF: Easy REF: p. 39

9. Laparoscopy is a surgical procedure that is used to remove eggs from the donor.

ANS: T PTS: 1 DIF: Easy REF: p. 42

10. *In vitro* fertilization, as the procedure is commonly used today, can lead to multiple births.

ANS: T PTS: 1 DIF: Easy REF: p. 44

MATCHING

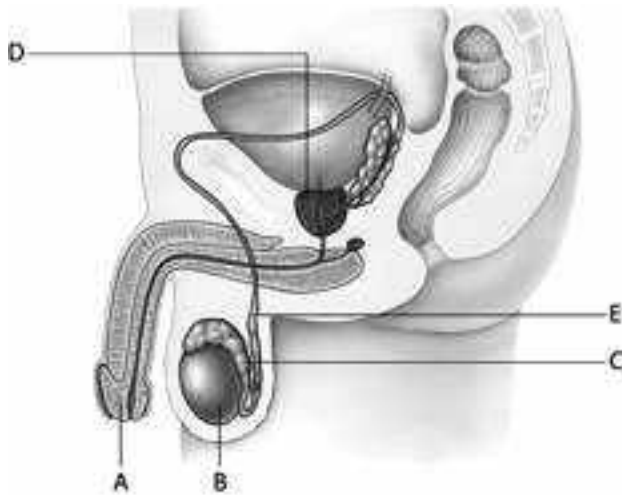
Match the structure to the function in the male reproductive tract.

- a. Provides a path for sperm to travel to the urethra
- b. Holds the testes away from the body
- c. Organ of intercourse
- d. Produces sperm
- e. Stores sperm

- 1. Testes
- 2. Vas deferens
- 3. Penis
- 4. Scrotum
- 5. Epididymis

1. ANS: D	PTS: 1	DIF: Easy	REF: p. 34
2. ANS: A	PTS: 1	DIF: Easy	REF: p. 34
3. ANS: C	PTS: 1	DIF: Easy	REF: p. 34
4. ANS: B	PTS: 1	DIF: Easy	REF: p. 34
5. ANS: E	PTS: 1	DIF: Easy	REF: p. 34

Match the following descriptions with the appropriate letter.



6. sperm are stored here
7. sperm exit the male body
8. sperm travel through this during sexual arousal
9. important for the production of semen
10. testosterone is produced here

6. ANS: C	PTS: 1	DIF: Moderate	REF: p. 34-35
7. ANS: A	PTS: 1	DIF: Moderate	REF: p. 34-35
8. ANS: E	PTS: 1	DIF: Moderate	REF: p. 34-35
9. ANS: D	PTS: 1	DIF: Moderate	REF: p. 34-35
10. ANS: B	PTS: 1	DIF: Moderate	REF: p. 34-35

ESSAY

1. Compare and contrast possible factors responsible for female and male infertility problems.

ANS:

Factors common to both sexes: Smoking cigarettes, exposure to environmental factors, obesity, hormone levels, and complications due to venereal diseases. Factors specific to women: Absent or damaged ovaries, premature menopause, secondary amenorrhea, fallopian tube blockage, appendicitis, colitis, scar tissue from previous surgeries, age, absent uterus, endometriosis, malformation of the innermost layers of the endometrium. Factors specific to men: Low sperm count (possible causes include drug usage, mumps and other diseases, alcohol consumption, injury to the testes), low sperm motility, impotence (possible causes include emotional, physical, drug usage, high blood pressure, diabetes), aspermia (possible causes include surgery, injury, drugs), undescended or no testes.

PTS: 1 DIF: Difficult REF: p. 38-40

2. Discuss some of the implications of assisted reproductive technologies (ART).

ANS:

Answers will vary but should include a discussion touching on some of these points: ART allows infertile couples to have children, may play a role in couples' decisions to postpone, may affect adoption decisions, can greatly affect couples' finances. The student may also discuss religious, ethical, societal, and economic issues.

PTS: 1 DIF: Moderate REF: Entire chapter

SHORT ANSWER

1. How can *in vitro* fertilization be used to help infertile couples conceive? Describe the process.

ANS:

The most common reason for using *in vitro* fertilization is if there is blockage of the fallopian tubes in the female. Sperm from the male and eggs harvested from the female are combined in a laboratory dish. The embryos are transferred to the woman's uterus.

PTS: 1 DIF: Moderate REF: p. 41

2. Under what circumstances might a couple decide to use a paid surrogate stranger?

ANS:

The most common reason to use a surrogate would be if the woman does not have a uterus or if the uterus does not function properly. Often a relative or friend volunteers to carry the baby for an infertile couple and give the baby to them after birth. If this is not the case, the couple may opt to contract a paid stranger to act as the surrogate.

PTS: 1 DIF: Moderate REF: p. 42

3. What are some of the legal and ethical issues involved in using a surrogate?

ANS:

In some cases, surrogates have wanted to keep the babies they carried, but courts have upheld the contracts, especially in gestational surrogacy. Some feel that paying surrogates is the same as baby selling. Recently, however, the number of women being gestational surrogates has increased. There is also concern when a couple contracting with a surrogate divorce.

PTS: 1 DIF: Moderate REF: p. 42, 45-46

4. The number of couples with infertility problems has increased in recent years. What are some of the possible reasons for this increase in infertility?

ANS:

Answers may vary but should include that the most likely reason for this increase in infertility is that many women are delaying having their first child until they are over the age of 35.

PTS: 1 DIF: Easy REF: p. 40