

Chapter 2 - Preconception Nutrition

True / False

1. The subfertility of one partner can be compensated by the reproductive capacity of the other partner.

- a. True
- b. False

ANSWER: True

2. Weight gain is the recommended first-line treatment for amenorrhea related to low body weight.

- a. True
- b. False

ANSWER: True

3. During the preconception period, factors such as weight status; folic acid, iron, and antioxidant intake; and dietary supplement use would be addressed as part of the nutrition care process.

- a. True
- b. False

ANSWER: True

4. Obese women tend to have higher levels of estrogen, androgens, and leptin than nonobese women.

- a. True
- b. False

ANSWER: True

5. The hypothalamus is responsible for temperature regulation and sleep.

- a. True
- b. False

ANSWER: True

6. Prostate gland is an endocrine gland that contributes fluid to the semen.

- a. True
- b. False

ANSWER: False

7. It is easier and more efficient to build up iron stores before pregnancy than during pregnancy.

- a. True
- b. False

ANSWER: True

8. Nutrient requirements for both men and women should be met through dietary supplements rather than foods.

- a. True
- b. False

ANSWER: False

9. Fertility usually resumes immediately after discontinuing the use of contraceptives.

- a. True

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b. False

ANSWER: False

10. In Indonesia, a couple applying for a marriage license have to receive advice on iron status from those dispensing the license.

a. True

b. False

ANSWER: True

11. The desire of couples planning for pregnancy to have a healthy newborn makes the preconceptional period too stressful to address any psychosocial needs.

a. True

b. False

ANSWER: False

Multiple Choice

12. Fertility refers to the _____.

a. biological capacity to bear children

b. desire to bear children

c. actual production of children

d. number of births per 1000 miscarriages

e. number of births per 1000 women of childbearing age

ANSWER: c

13. Infertility is generally defined as the lack of conception after _____ of unprotected intercourse.

a. 3 months

b. 6 months

c. 9 months

d. 1 year

e. 1.5 year

ANSWER: d

14. Which of the following factors is related to altered fertility in women?

a. Anorexia nervosa

b. Inadequate zinc status

c. Exposure to lead

d. High intake of soy foods

e. Halogen exposure

ANSWER: a

15. The protein secreted by fat cells that, by binding to specific receptor sites in the hypothalamus, decreases appetite, increases energy expenditure, and stimulates gonadotropin secretion is called _____.

a. estrogen

b. progesterone

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- c. collagen
- d. leptin
- e. testosterone

ANSWER: d

16. The most common known cause of miscarriage for women is _____.

- a. a structural abnormality in the uterus
- b. the presence of a severe defect in the fetus
- c. maternal infection
- d. an endocrine disorder
- e. physical trauma to the mother

ANSWER: b

17. The _____ phase of the menstrual cycle occurs after ovulation.

- a. follicular
- b. luteal
- c. estrogen
- d. primordial
- e. menstruation

ANSWER: b

18. The first half of the menstrual cycle is called the _____ phase.

- a. follicular
- b. luteal
- c. estrogen
- d. primordial
- e. menses

ANSWER: a

19. Ovulation results from a surge in the _____ hormone.

- a. estrogen
- b. progesterone
- c. luteinizing
- d. follicle-stimulating
- e. gonadotropin-releasing

ANSWER: c

20. The two hormones secreted by the pituitary gland during the follicular phase of menstrual cycle are _____.

- a. follicle-stimulating hormone and progesterone
- b. progesterone and estrogen
- c. follicle-stimulating hormone and luteinizing hormone
- d. luteinizing hormone and progesterone
- e. luteinizing hormone and estrogen

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ANSWER: c

21. The _____ releases _____, stimulating the pituitary gland to release FSH and LH.
- a. ovary; estrogen
 - b. ovary; progesterone
 - c. uterus; progesterone
 - d. hypothalamus; estrogen
 - e. hypothalamus; gonadotropin-releasing hormone

ANSWER: e

22. After ovulation, the corpus luteum secretes _____, which _____.
- a. progesterone and estrogen; stimulate the ovulation of a second egg
 - b. progesterone and estrogen; stimulate development of the endometrium
 - c. follicle-stimulating hormone and luteinizing hormone; stimulate development of the endometrium
 - d. luteinizing hormone and estrogen; facilitate fertilization of the egg
 - e. luteinizing hormone and estrogen; stimulate ovulation of a second egg

ANSWER: b

23. A menstrual flow results from _____.
- a. the implantation of a fertilized ovum in the endometrium
 - b. a decrease in progesterone and estrogen levels
 - c. the release of gonadotropin-releasing hormone by the hypothalamus
 - d. the production of prostaglandins by the uterus
 - e. the release of progesterone and estrogen by the corpus luteum

ANSWER: b

24. In a typical 28-day cycle, when would levels of luteinizing hormone most likely be the highest?
- a. day 1
 - b. day 7
 - c. day 10
 - d. day 14
 - e. day 28

ANSWER: d

25. Cramps and other side effects of menstruation can be traced to the production of _____ by the uterus.
- a. progesterone
 - b. estrogen
 - c. prostaglandins
 - d. luteinizing hormone
 - e. gonadotropin-releasing hormone

ANSWER: c

26. Obesity is generally indicated by body mass index values over _____ kg/m².
- a. 20

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- b. 29
- c. 25.5
- d. 40
- e. 30

ANSWER: e

27. In males, mature sperm are stored in the _____.

- a. testes
- b. vas deferens
- c. prostate gland
- d. seminal vesicles
- e. epididymis

ANSWER: e

28. Which hormone(s) trigger(s) the production of testosterone by the testes?

- a. follicle-stimulating hormone
- b. luteinizing hormone
- c. progesterone
- d. luteinizing hormone and progesterone
- e. follicle-stimulating hormone and luteinizing hormone

ANSWER: e

29. Exposure to high levels of _____ is related to decreased sperm production and abnormal sperm motility and shape.

- a. zinc
- b. iron
- c. lead
- d. iodine
- e. selenium

ANSWER: c

30. Endometriosis is defined as _____.

- a. scarring and blockage of the fallopian tubes
- b. the condition in which endometrial tissue becomes embedded within other body tissues
- c. a modification of pregnancy hormones that results in infertility
- d. an infection of the cervix
- e. the inability to get pregnant

ANSWER: b

31. The leading diagnoses related to infertility are _____.

- a. endocrine abnormalities that modify hormonal regulation of fertility
- b. unknown causes
- c. environmental contaminants such as lead and mercury
- d. overweight and obesity in men

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e. sexually transmitted diseases

ANSWER: a

32. Which factor would be more likely to affect female fertility than male fertility?

- a. inadequate body fat
- b. poor iron stores
- c. high alcohol intake
- d. excessive body fat
- e. excessive exercise

ANSWER: b

33. Which factor has been linked to impaired fertility in males but not females?

- a. high sperm count
- b. oxidative stress
- c. exercise
- d. excessive heat to the gonads
- e. Poor iron stores

ANSWER: d

34. Which statement related to male and female fertility is true?

- a. During a female's fertile years, approximately 1000 ova will mature and be released for possible fertilization.
- b. For males, sperm numbers and viability decrease somewhat after age 30.
- c. For both males and females, the quality of eggs and sperm decrease somewhat with age.
- d. Females are born with mature eggs.
- e. Males produce sperm from birth until death.

ANSWER: c

35. Pelvic inflammatory disease (PID) can _____.

- a. cause less estrogen to be secreted, thus blocking ovulation
- b. lead to scarring and blockage of the fallopian tubes
- c. cause sperm to become less viable in males
- d. increase the lining of the endometrium
- e. decrease zinc absorption

ANSWER: b

36. A body mass index (BMI) greater than _____ kg/m² is typically needed to sustain normal reproductive function in women.

- a. 17
- b. 20
- c. 25
- d. 30
- e. 35

ANSWER: b

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37. An anovulatory cycle is _____.
a. the absence of a menstrual cycle
b. a menstrual cycle in which ovulation does not occur
c. an abnormally short menstrual cycle
d. an abnormally long menstrual cycle
e. a menstrual cycle in which more than one egg is ovulated

ANSWER: b

38. Which dietary component can protect cells of the reproductive system from damage by free radicals?
a. sodium
b. calcium
c. iron
d. iodine
e. antioxidants

ANSWER: e

39. Which of the following can be defined as an alteration in the normal sequence of a gene?
a. allele
b. gene variant
c. functional hypothalamic amenorrhea
d. gene splicing
e. endometriosis

ANSWER: b

40. Folic acid is a synthetic form of which vitamin?
a. A
b. C
c. B
d. E
e. D

ANSWER: c

41. _____ is a pea-sized gland located at the base of the brain.
a. Hypothalamus
b. Pituitary gland
c. Clitoris
d. Testes
e. Epididymis

ANSWER: b

42. The development of facial and heart abnormalities in the fetus has been linked to _____ by the mother.
a. excessive vitamin A intake
b. decreased intake of iodine
c. excessive protein intake

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- d. increased energy expenditure
- e. a decreased folate intake

ANSWER: a

43. DNA methylation _____.
- a. modifies gene function in the fetus during late pregnancy
 - b. activates gene expression
 - c. is an abnormal part of development
 - d. is needed for cellular differentiation
 - e. is unaffected by nutritional intake

ANSWER: d

44. Spina bifida is an example of a _____.
- a. neural tube defect
 - b. DNA modification
 - c. gene variant
 - d. nutritional deficiency
 - e. metabolic programming mechanism

ANSWER: a

45. The risk of early delivery is increased by _____.
- a. excessive vitamin A intake
 - b. iron deficiency
 - c. iodine deficiency
 - d. high levels of lead in the maternal blood
 - e. diabetes

ANSWER: b

46. Refined grain products are often fortified with _____ to decrease rates of _____.
- a. folic acid; neural tube defects
 - b. iron; neural tube defects
 - c. iodine; late delivery
 - d. folic acid; late delivery
 - e. vitamin B; fetal heart abnormalities

ANSWER: a

47. What nutritional and health advice would a doctor likely give to a preconceptional woman?
- a. The woman's physical activity should be limited to less than 30 minutes per day.
 - b. The woman should eat mostly dark green vegetables.
 - c. At least half of the woman's grain intake should be from refined grains.
 - d. The woman's vitamin intake should be at least 10,000 IU of vitamin A per day.
 - e. The woman should consume 400 mcg of folic acid in addition to dietary folate.

ANSWER: e

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48. Contraceptives may contain _____.
a. estradiol only
b. luteinizing hormone only
c. estradiol only or progestin only
d. progestin only or a combination of estradiol and progestin
e. a combination of luteinizing hormone and progestin

ANSWER: d

49. Combination hormonal contraceptives are least likely to be associated with _____.
a. weight gain
b. decreased blood levels of HDL cholesterol
c. increased risk of blood clots
d. increased levels of triglycerides and LDL cholesterol
e. increased blood glucose and insulin

ANSWER: a

50. A woman would likely be advised to switch from a progestin-only hormonal contraceptive to a combination hormonal contraceptive because of _____.
a. weight gain
b. irritability
c. fatigue
d. headache
e. abdominal pain

ANSWER: a

51. Which of the following glands secretes hormones?
a. seminal vesicle
b. bulbourethral gland
c. epididymis
d. oviduct
e. ovary

ANSWER: e

52. Women taking oral contraceptive pills are cautioned against _____.
a. consuming large amounts of animal products
b. consuming large amounts of carbohydrates
c. eating more than half a cup of peanut butter weekly
d. smoking
e. ingesting too much of vitamin B

ANSWER: d

53. The regular consumption of which of the following is recommended to improve iron deficiency?
a. sweet snacks
b. apricot

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- c. lean meat
- d. egg
- e. rice

ANSWER: c

54. In a study done in California, women who received WIC services through to a subsequent pregnancy had _____ than women who received WIC services only during their first pregnancy.

- a. newborns with higher birth weights
- b. greater risk of gestational diabetes
- c. newborns with lower birth weights
- d. newborns with lower birth lengths
- e. higher blood glucose levels

ANSWER: a

55. Which of the following is an antioxidant?

- a. vitamin E
- b. vitamin B
- c. iron
- d. magnesium
- e. glycol

ANSWER: a

56. In a study conducted in Vietnam, the offspring of women given multivitamin supplements before conception were less likely to be stunted and had better fine motor skills at age 2 than women who received only _____ supplements.

- a. iron
- b. zinc
- c. folic acid
- d. retinoic acid
- e. iodine

ANSWER: c

57. The National Academy of Nutrition and Dietetics has developed a set of standards called _____ to serve as guidelines for the delivery of nutrition services.

- a. the Nutrition Care Process
- b. Supplemental Nutrition Program for Women, Infants, and Children
- c. the preconception health services
- d. the pregnancy health standards
- e. the preconception nutrition guidelines

ANSWER: a

58. Which statement correctly describes preconception health care?

- a. Preconception health care is concerned with the health and nutrition status of females only.
- b. The psychological needs of pregnant females are not addressed as part of the preconception health care.
- c. Fetal health and development is not a concern of preconception health care.

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- d. Preconception health care may include topics such as vaccinations, weight status, and dietary intake.
- e. Preconception health care advises couples about the most effective contraceptive methods to use.

ANSWER: d

Matching

Matching

- a. The biological inability to bear children after one year of unprotected intercourse
- b. The mass of tissue formed from the follicle after the egg is released
- c. The biological ability to bear children
- d. The actual production of children
- e. The developing organism from 8 weeks to birth
- f. The developing organism from conception to 8 weeks
- g. The involuntary absence of production of children
- h. Taking an unusually long time to conceive or having repeated pregnancy losses
- i. The period in life in which humans become biologically capable of reproduction
- j. The absence of a menstrual cycle
- k. The loss of a conceptus in the first 20 weeks of pregnancy

59. Embryo

ANSWER: f

60. Fecundity

ANSWER: c

61. Subfertility

ANSWER: h

62. Fetus

ANSWER: e

63. Fertility

ANSWER: d

64. Infecundity

ANSWER: a

65. Miscarriage

ANSWER: k

66. Puberty

ANSWER: i

67. Corpus luteum

ANSWER: b

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68. Amenorrhea

ANSWER: j

69. Infertility

ANSWER: g

Subjective Short Answer

70. Describe the three types of individuals who would be considered subfertile.

ANSWER: Women who experience multiple miscarriages (variously defined as two or three), men who have sperm abnormalities (such as low sperm count or density, malformed sperm, or immobile sperm), and women who ovulate infrequently are considered subfertile.

71. Discuss the relationship between fertility, body weight, and body fat in females. Identify the possible implications related to both inadequate and excessive body fat.

ANSWER: In normal-weight women, weight loss that exceeds approximately 10–15 percent of usual weight decreases estrogen, LH, and FSH concentrations. Consequences of these hormonal changes include amenorrhea, anovulatory cycles, and short or absent luteal phases. It is estimated that about 30 percent of cases of impaired fertility are related to simple weight loss. Hormone levels tend to return to normal when weight is restored to within 95 percent of previous weight. Weight gain is the recommended first-line treatment for amenorrhea related to low body weight.

Obese women tend to have higher levels of estrogen, androgens, and leptin than nonobese women. These hormonal changes favor the development of menstrual-cycle irregularity (it occurs in 30–47 percent of overweight and obese women), ovulatory failure and anovulatory cycles, and amenorrhea. Loss of excess body fat is related to improvements in hormone levels, oxidative stress and chronic inflammation, and conception rates in both men and women. A critical level of body fat (usually indicated by a body mass index over 20 kg/m²) is needed to trigger and sustain normal reproductive functions in women. Low level of body fat during adolescence is related to delays in the age of onset of menstruation and to reduced fertility later in life.

72. Describe the sources of disruptions in fertility in males and females.

ANSWER: The intricate mechanisms that regulate fertility can be disrupted by many factors, including adverse nutritional exposures, severe stress, infection, tubal damage and other structural problems, and chromosomal abnormalities. Conditions that modify fertility appear to affect hormones that regulate ovulation, the presence or length of the luteal phase, sperm production, or the tubular passageways that ova and sperm must travel for conception to occur. Sexually transmitted infections, for example, can result in pelvic inflammatory disease (PID), which may lead to scarring and blockage of the fallopian tubes. Endometriosis is also a common cause of reduced fertility. It develops when portions of the endometrial wall that build up during menstrual cycles leave the uterus and become embedded within other body tissues. Endocrine abnormalities that modify hormonal regulation of fertility are the leading diagnoses related to infertility. "Unknown cause" is the next most common diagnosis, applied to about 10 percent of all cases of male and female infertility.

73. Define pelvic inflammatory disease and explain its cause.

ANSWER: Pelvic inflammatory disease is a general term applied to infections of the cervix, uterus, fallopian tubes, or ovaries. It occurs predominantly in young women and is generally caused by infection with a sexually transmitted disease, such as gonorrhea or Chlamydia.

74. A couple trying to become pregnant for six months without success is seeking medical care. The man has a body mass index of 28, and the woman has recently had irregular menses. During their medical visit, the woman mentioned that she

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had recently lost 10 pounds in a short time because she was worried about gaining too much weight during a future pregnancy. What types of dietary or lifestyle behaviors would be important to discuss?

ANSWER: The man's body mass index indicates that he may be overweight. Thus, he may be advised to eat a healthier diet, follow nutritional guidelines, and exercise, because the loss of body fat is related to improvements in hormone levels, oxidative stress and chronic inflammation, and conception rates. The woman's irregular menses after losing 10 pounds suggest that her weight loss may have negatively affected her fertility (as sudden weight loss has been linked to decreased estrogen, LH, and FSH concentrations). Her irregular menses, termed amenorrhea, may return to normal if her weight is restored to within 95 percent of her previous weight. Through a healthy program of regaining weight and maintaining healthy activity, her hormone levels may be returned to normal and her fertility improved.

75. Explain the mechanism of how contraceptive pills containing estradiol and progestin prevent pregnancy.

ANSWER: When used together, estradiol and progestin suppress the action of LH and FSH and thereby ovulation. Progestin blocks LH and ovulation, and, by causing the cervical mucus to become thick and sticky, it induces a barrier to sperm.

76. How might male reproductive health suffer because of inadequate intake of antioxidant nutrients?

ANSWER: Antioxidant nutrients are needed to protect cells of the reproductive system, including eggs and sperm, from damage due to oxidative stress. Oxidative stress occurs when the production of potentially destructive reactive oxygen molecules (free radicals) exceeds the body's own antioxidant defenses. Reactive oxygen molecules attack polyunsaturated fatty acids in sperm membranes, which decreases sperm motility and reduces the ability of sperm to fuse with an egg. Once the membrane surrounding sperm is damaged, reactive oxygen molecules can enter the sperm cell and damage DNA. This can result in the passage of defective DNA.

77. Discuss the gene variant associated with folate status and its importance to periconceptual women.

ANSWER: Some individuals have an increased need for folate due to specific gene variants involved in folate metabolism. These gene variants can impair the conversion of folate to its active form and increase folate requirement. One of the best-studied and most common gene variants affects 5,10-methylenetetrahydrofolate reductase (MTHFR) activity. This enzyme is responsible for production of the major circulating form of folate used by the body. The C677T allele of the gene that encodes for MTHFR produces an enzyme that has reduced activity. Women with this gene variant are at increased risk of having a neural tube defect-affected newborn.

78. The Healthy People 2020 objectives related to infant health include reductions in preterm birth rates, incidence of spina bifida, and neural tube defects. Define neural tube defects and describe the time frame for their development after conception. Also, discuss any recommended behavioral or nutritional interventions important for women considering pregnancy.

ANSWER: Neural tube defects (NTDs) are a group of birth defects that are caused by incomplete development of the brain, spinal cord, or their protective coverings. Spina bifida is one of the most common types of NTDs. NTDs develop between the third and fourth week after conception—or before many women even know they are pregnant, and well before prenatal care generally begins. Folate is an essential nutrient required for DNA replication and as a component of enzymatic reactions involved in amino acid synthesis and vitamin metabolism. Knowledge of the folate–neural tube defect relationship, and awareness that folate intake was inadequate in many women of childbearing age, prompted public health efforts to increase folate intake. In particular, efforts are focused on encouraging women to consume folic acid, a highly absorbable, synthetic form of this B vitamin. In 1998, the Food and Drug Administration mandated that refined grain products such as white bread, grits, crackers, rice, and pasta be fortified with folic acid. Many countries now fortify refined grain products with folic acid, and rates of NTDs have decreased significantly in these countries.

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79. What types of services are offered as part of preconceptional care?

ANSWER: Increasingly, routine preconceptional health care visits and educational sessions are being recommended and introduced into health care services. Risk assessment services focus on ascertainment of health history, dietary intake, folate and iron status, weight status, drug and alcohol use, dietary supplement use, and vaccination status. Psychosocial needs should also be addressed as part of preconceptional care, and referrals made to appropriate services for issues such as eating disorders, abuse, violence, or lack of food or shelter.

80. List the four steps of the Nutrition Care Process.

ANSWER: The Nutrition Care Process consists of nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation.