1. Healthy bones:
   a. allow for mobility
   b. serve as a storehouse for minerals
   c. protect against injury
   d. all of the above

2. Research has led to an understanding that certain medications such as ____ are a significant contributor to osteoporosis.
   a. antibiotics
   b. vasodilators
   c. glucocorticoids
   d. hormones

3. It is estimated that in the year 2020 one in two Americans over the age of 50 will have, or be at high risk of developing osteoporosis.
   a. True
   b. False

4. The risk of mortality is 2.8 to ____ times greater among hip fracture patients during the first 3 months after a fracture.
   a. 3
   b. 4
   c. 5
   d. 7

5. The World Health Organization (WHO) estimates that ____ million Americans over age 50 have low bone mass or “osteopenia” of the hip.
   a. 15
   b. 25
   c. 34
   d. 52

6. Approximately ____% of individuals age 12 – 21 years old report that they engage in no exercise at all.
   a. 15
   b. 25
   c. 45
   d. 60
7. According to the text, the most important barriers towards bringing improvements in bone health relate to all of the following, except:
   a. men
   b. racial minorities
   c. ethnic minorities
   d. adolescents

8. In the Healthy People 2010 Osteoporosis and Bone Health Report, objective number 2.9 has as its target to reduce cases of osteoporosis by ____%.
   a. 2
   b. 6
   c. 8
   d. 12

9. The skeleton is a storehouse for calcium and phosphorus.
   a. True
   b. False

    a. True
    b. False

11. Trabecular bone makes up ____% of the total skeletal mass.
    a. 15
    b. 25
    c. 50
    d. 75

12. During childhood bones grow because ____ occurs inside the bone.
    a. restriction
    b. reduction
    c. resorption
    d. reversal

13. Peak bone mass is typically achieved by the early:
    a. teens
    b. 20s
    c. 30s
    d. 40s

14. Most of the adult skeleton is replaced about every ____ years.
    a. 2
    b. 5
    c. 10
    d. 18
15. Inhibition of bone formation is the dominant mechanism for weakening of the skeleton in:
   a. primary osteoporosis
   b. Paget’s disease
   c. glucocorticoid-induced osteoporosis
   d. osteogenesis imperfecta

16. The final phase of bone formation lasts up to ___ to ___ months.
   a. 1 – 2
   b. 3 – 4
   c. 5 – 6
   d. 9 – 12

17. Bone health is influenced by all of the following, except:
   a. genetic inheritance
   b. environment and diet
   c. physical activity
   d. socioeconomic status

18. Calcium regulating hormones include all of the following, except:
   a. cortisol
   b. parathyroid hormone
   c. calcitriol
   d. calcitonin

19. The hormone derived from vitamin D is:
   a. cortisol
   b. calcitonin
   c. calcitriol
   d. testosterone

20. Rickets in children and osteomalacia in adults is caused by a deficiency in vitamin:
   a. B
   b. C
   c. D
   d. K

21. Insulin-like growth factor-1 (IGF-1) is produced in large amounts in the:
   a. spleen
   b. liver
   c. bone marrow
   d. small intestines
22. The most common fractures in osteoporosis occur at all of the following locations, except:
   a. spine
   b. wrist
   c. hip
   d. skull

23. For practical purposes, the WHO has defined osteoporosis as a bone mineral density (BMD) value more than ____ standard deviations below the mean for normal young white women.
   a. 1.0
   b. 1.5
   c. 2.0
   d. 2.5

24. Juvenile osteoporosis affects previously healthy children between the ages of:
   a. 1 – 2
   b. 4 – 5
   c. 8 – 14
   d. 16 – 18

25. Between 30% - ____% of elderly men are deficient in biologically active sex steroids.
   a. 40
   b. 50
   c. 60
   d. 70

26. All of the following are genetic disorders that contribute to secondary osteoporosis, except:
   a. cystic fibrosis
   b. Ehlers-Danlos
   c. osteogenesis imperfecta
   d. ankylosing spondylitis

27. A study found that ____% of women with systemic lupus erythematosus reported at least one fracture since the onset of the disease.
   a. 5
   b. 12
   c. 18
   d. 38

28. One factor that may cause bone loss in severely depressed individuals is increased production of:
   a. glucose
   b. insulin
   c. cortisol
   d. calcitonin
29. When more than 7.5 mg of prednisone or equivalent per day is administered, the fracture rate increases by at least ____ fold by 6 months.
   a. 4  
   b. 10  
   c. 15  
   d. 20  

30. An inherited condition, X-linked hypophosphatemic rickets, affects the kidneys ability to retain:
   a. water  
   b. calcium  
   c. phosphate  
   d. protein  

31. Adynamic bone disease is associated with:
   a. Cushing’s syndrome  
   b. renal osteodystrophy  
   c. Paget's disease  
   d. cystic fibrosis  

32. In very rare cases less than ____% of patients with Paget’s disease developed osteosarcoma.
   a. 1  
   b. 5  
   c. 12  
   d. 25  

33. The most severe form of osteogenesis imperfecta is type:
   a. I  
   b. II  
   c. III  
   d. IV  

34. The most common benign bone tumor is:
   a. Ewing’s sarcoma  
   b. osteosarcoma  
   c. myeloma  
   d. osteochondroma  

35. White women at age 50 years have a ____% lifetime risk of hip fracture.
   a. 17.5  
   b. 15.6  
   c. 13.1  
   d. 7.2
36. One-fourth of the spine fractures that come to clinical attention are caused by:
   a. car accidents
   b. falls
   c. pathology
   d. stretching and bending

37. Fracture incidence in the United States is usually highest for:
   a. Asians
   b. Blacks
   c. Whites
   d. American-Indians

38. Between the ages of 20 and 80, White women lose ____ of their hip bone mineral density.
   a. one-fourth
   b. one-third
   c. one-half
   d. two-thirds

39. Mexican-American women in the United States have an estimated prevalence of hip osteoporosis of ____%.
   a. 6
   b. 9
   c. 14
   d. 17

40. The dialysis rate for Blacks is ____ times greater than that of Whites.
   a. 5
   b. 10
   c. 15
   d. 20

41. Despite the large numbers affected very few people die as a direct result of bone disease.
   a. True
   b. False

42. A prospective study of women over 65 showed that each standard deviation of bone loss at the hip was associated with a ____% increase in total mortality.
   a. 55
   b. 42
   c. 30
   d. 25
43. The least debilitating fractures from osteoporosis occurs in the:
   a. hip
   b. spine
   c. pelvis
   d. wrist

44. The typical hip fracture patient is about ___ years old.
   a. 90
   b. 80
   c. 70
   d. 60

45. Only 40% - ___% of patients regain their previous ambulatory function a year after the hip fracture.
   a. 45
   b. 56
   c. 79
   d. 84

46. In addition to functional impairments, fractures from bone disease can have a negative impact on:
   a. self-esteem and body image
   b. psychological mood
   c. feelings of isolation and helplessness
   d. all of the above

47. All of the following are clinical signs and consequences of spine fractures, except:
   a. weight loss
   b. kyphosis
   c. reduced lung function
   d. increase in height

   a. 68
   b. 52
   c. 45
   d. 33

49. A variety of studies indicate that genetic factors are responsible for determining 50% to ___% of bone mass and other qualitative aspects of bone.
   a. 55
   b. 75
   c. 80
   d. 90
50. Between the age of 40-50, age-related bone loss may equal a total of ____% of bone.
   a. 15  
   b. 25  
   c. 35  
   d. 40

51. The Institute of Medicine (IOM) recommends that those ages 9-18 should have ____mg of calcium per day.
   a. 210  
   b. 1000  
   c. 1200  
   d. 1300

52. Sunlight is the main source for vitamin:
   a. D  
   b. A  
   c. K  
   d. C

53. Excess vitamin D can be toxic, leading to all the following, except:
   a. hypercalcemia  
   b. hypertension  
   c. kidney failure  
   d. calcification of soft tissue

54. After reviewing available trial studies, investigators concluded that calcium supplements reduced bone loss by approximately ____% after 2 or more years of use.
   a. 12  
   b. 8  
   c. 4  
   d. 2

55. About ____% of the body's magnesium is found in the skeleton.
   a. 80  
   b. 70  
   c. 60  
   d. 40

56. Recent studies in adult women suggest that each additional gram of sodium eaten per day increase bone loss by ____% per year.
   a. 1  
   b. 2  
   c. 5  
   d. 7
57. The Surgeon General’s Report recommends a minimum of ___ physical activity of moderate intensity in most, if not all days of the week.
   a. 15 minutes
   b. 30 minutes
   c. 1 hour
   d. 2 hours

58. All of the following are true regarding the effects of physical activity on bone mass, except:
   a. the effects vary by age
   b. lifting weights helps improve bone density of the hips
   c. when activity level is stopped or reduced the effect diminishes accordingly
   d. bone gains will be greater in a sedentary person who becomes physically active than in an active person who increase his/her level of physical activity

59. Jumping from a height of roughly ___ inches is a safe, effective simple method of improving bone mass and size in children.
   a. 5
   b. 10
   c. 15
   d. 20

60. Sarcopenia refers to:
   a. overgrowth of bone matrix
   b. malabsorption of calcium
   c. involuntary loss of skeletal muscle mass
   d. overloading of cortical bone

61. All of the following are consistent predictors of bone mass in adolescents, except:
   a. body weight and height
   b. calcium levels
   c. pubertal development
   d. family income

62. Older women who experience weight loss in later years have been found to have a ___ fold greater risk of subsequent hip fracture.
   a. 2
   b. 4
   c. 6
   d. 10

63. About ___% to ___% of falls in the elderly result in fracture.
   a. 3 – 5
   b. 10 – 15
   c. 20 – 25
   d. 45 – 50
64. All of the following are true regarding reproductive factors and bone health, except:
   a. amenorrhea is linked to low bone mass
   b. bilateral oophorectomy does not result in decrease bone mass
   c. the effect of oral contraceptives on bone health has not been established
   d. pregnancy and lactation generally do not decrease bone mass of healthy adult women

65. Anti-seizure medications that cause bone loss include:
   a. Phenobarbital and sodium valproate
   b. Carbamazepine
   c. Sodium valproate
   d. all of the above

66. All of the following statements concerning threats to bone health are true, except:
   a. the nicotine and cadmium found in cigarettes can have a direct toxic effect on bone health
   b. alcoholism has not been demonstrated to have negative effects on bone
   c. lead is among the most significant environmental threats to bone health
   d. extreme low body weight has a negative impact on bone health

67. The Dietary Guideline for Americans recommends that individuals eat the following each day:
   a. 6-11 servings of grain foods and 3 –5 servings of vegetables
   b. 2- 4 servings of fruit
   c. 2-3 servings each of dairy or other calcium rich foods and meat or beans
   d. all of the above

68. The food source containing 306 mg calcium is:
   a. cheddar cheese, 1½ oz. shredded
   b. cream cheese, regular, 1 tbsp.
   c. sardines, canned in oil with bones, 3 oz.
   d. 8 oz. of soy beverage that is calcium fortified

69. Vegetables containing calcium that is well absorbed includes:
   a. carrots and turnips
   b. broccoli and kale
   c. spinach and beets
   d. asparagus and squash

70. One cup of fortified milk contains ___IU of vitamin D.
   a. 25
   b. 50
   c. 75
   d. 100
71. The nutrient that helps certain enzymes and local regulators function properly is:
   a. boron  
   b. copper  
   c. fluoride  
   d. isoflavones

72. All of the following are examples of weight-bearing exercise for adults, except:
   a. lap swimming  
   b. stair-climbing  
   c. jumping rope  
   d. jogging

73. “Red Flags” that warrant further assessment for osteoporosis or other bone disease include:
   a. history of fractures  
   b. unusual cessation of menstrual periods  
   c. high levels of serum calcium or alkaline phosphatase  
   d. all of the above

74. A finding of a high serum alkaline phosphatase level is an indicator of:
   a. osteopenia  
   b. osteomalacia  
   c. Paget’s disease  
   d. osteopetrosis

75. The “gold standard” of tests for identifying osteoporosis and fracture risk is:
   a. radiography  
   b. computed tomography (CT)  
   c. magnetic resonance imaging (MRI)  
   d. bone mineral density testing

76. The Osteoporosis Risk Assessment Instrument (ORAI) has___% specificity.
   a. 93  
   b. 85  
   c. 70  
   d. 39

77. Among elderly white women those who currently use anticonvulsant drugs are considered to be at ___% increased risk for hip fracture.
   a. 100  
   b. 80  
   c. 70  
   d. 60
78. The U.S. Preventive Services Task Force (USPSTF) recommends bone density screening for all women age ____ and older.
   a. 30
   b. 45
   c. 55
   d. 65

79. The most widely accepted method for measuring BMD is:
   a. dual x-ray absorptiometry (DXA)
   b. peripheral DXA (PDXA)
   c. quantitative computed tomography (QCT)
   d. quantitative ultrasound (QUS)

80. The International Society of Clinical Densitometry (ISCD) recommends using the mean score for the L 1 to L ____ vertebrae to calculate spine BMD.
   a. 3
   b. 4
   c. 5
   d. 6

81. It is recommended that patients receiving high-dose long-term glucocorticoid therapy has BMD monitored every ____ until BMD is shown to be stable or improved.
   a. 3 months
   b. 6 months
   c. year
   d. 18 months

82. All of the following are formation markers, except:
   a. osteocalcin
   b. N-telopeptide of type I collagen
   c. bone specific alkaline phosphatase
   d. carboxyterminal propeptide of type I collagen

83. Researchers found that on average, a drug that reduced bone resorption by 70% would decrease the risk of non-spine fractures by ____%.
   a. 20
   b. 40
   c. 60
   d. 80

84. The most important use for bone markers today is in monitoring:
   a. severity of fractures
   b. compliance with proper diet
   c. effectiveness of ongoing therapy
   d. effects of an exercise program
85. The term that refers to actions that block or slow the progression of a disability to a state of dependency is:
   a. primary
   b. secondary
   c. tertiary
   d. remnant

86. All of the following are antiresorptive therapies, except:
   a. bisphosphonates
   b. estrogen
   c. teriparatide
   d. receptor modulators (SERMs)

87. Alendronate administration is not advised in patients with:
   a. hypertension
   b. gallstones
   c. renal failure
   d. abnormalities of the esophagus

88. Over a 3-year period, ibandronate has been shown to decrease the incidence of new spine fractures by ___%:
   a. 82
   b. 75
   c. 64
   d. 52

89. The FDA approved estrogen in ___ for the relief of menopausal symptoms.
   a. 1936
   b. 1942
   c. 1950
   d. 1956

90. Investigators have found that there was a decreased incidence of breast cancer in women who took raloxifene for ___ year(s).
   a. 10
   b. 5
   c. 3
   d. 1

91. Calcitonin is a hormone secreted by cells found within the:
   a. thyroid gland
   b. liver
   c. pancreas
   d. gallbladder
92. Zoledronic acid was recently approved for treatment of all the following, except:
   a. hypercalcemia
   b. hypotension
   c. myeloma
   d. metastatic breast cancer

93. Approximately ___% of advanced prostate cancer patients develops clinically significant bone metastasis.
   a. 90
   b. 80
   c. 70
   d. 50

94. Health care professionals that bear much of the responsibility of promoting awareness, diagnosis, prevention, and treatment of osteoporosis falls on:
   a. pediatricians
   b. geriatricians
   c. internists and primary care physicians
   d. all of the above

95. All of the following are true regarding infants who are born prematurely, except:
   a. it can take up to 15 years for their bone mass to catch up with that of full-term newborns
   b. breast feeding may not provide for all of their nutrient needs
   c. those that are breastfed need added nutrients, particularly calcium, vitamin D, phosphorus, and protein
   d. those that are not breastfed should be given infant formulas that are designed to provide calcium and phosphorus

96. The efficiency of calcium absorption is greatest when calcium is taken in a dose of ___ milligram (mg) or less.
   a. 2500
   b. 2000
   c. 1000
   d. 500

97. Sodium chloride intake increases:
   a. hormones released by the pituitary gland
   b. insulin secreted by the pancreas
   c. urine calcium excretion
   d. urine protein excretion

98. All of the following are true for older adults, except:
   a. calcium and vitamin D absorption increases with aging
   b. limited mobility causes the aged to be outdoors less and receive less sunlight
   c. recommended calcium intake is 1200 mg per day after age 50
   d. protein supplementation has been shown to speed healing of hip fractures
99. A T-score less than −2.5 indicates:
   a. excessive bone mass
   b. normal bone mass
   c. osteopenia
   d. osteoporosis

100. The Z-score in older individuals compares the patient’s bone density to that expected for their age, rather than to peak bone mass.
   a. True
   b. False

101. The physical therapist’s role in bone health includes:
   a. evaluate patient balance
   b. evaluate the patient’s risk of falling
   c. teach specific exercises and techniques to minimize risk of falling
   d. all of the above

102. The Clowes et al (2004) study suggests that the key to maximizing adherence to any therapy be:
   a. insurance reimbursement
   b. social acceptance of the therapy
   c. follow up by health care professionals
   d. family intervention and oversight

103. The health care system in the United States is a collection of independent enterprises, some small and some large, that provides or pays for various aspects of health care.
   a. True
   b. False

104. There is one overriding principle that governs systems-based approaches to osteoporosis and bone health that is, to focus on:
   a. hospital providers
   b. private practitioners
   c. populations
   d. Congressional support

105. The two aspects to the knowledge stage are the need for consumers to be aware of the importance of the bone health and for clinician to be aware of the evidence related to best practices for improving bone health.
   a. True
   b. False
106. The Assessing Care of Vulnerable Elder (ACOVE) project is aimed at changing behaviors related to:
   a. falls
   b. cognitive impairment
   c. urinary incontinence
   d. all of the above

107. A common strategy for using professional education to disseminate guidelines and evolving research includes presentations at meetings and other common continuing medical education activities has been overwhelmingly successful.
   a. True
   b. False

108. A systems-based approach to osteoporosis requires just treating the immediate problems or symptoms.
   a. True
   b. False

109. Public health agencies may want to consider supplementing their awareness activities with broad-based and/or targeted screening programs that include:
   a. vaccinations for influenza
   b. local screening for hypertension
   c. local screening for hypercholesterolemia
   d. all of the above

110. Several populations deserve special attention by all components of the health care system including the uninsured and underinsured, the poor, men, nursing home residents, frail elderly persons, and rural and other remote populations.
   a. True
   b. False

111. Minority populations that are more prone to lactose intolerance than are other groups include:
   a. Caucasians and Hispanics
   b. Pacific Islanders and African Americans
   c. Asians and African Americans
   d. American Indians and Asians

112. Men account for roughly ____% of all hip fractures.
   a. 5
   b. 10
   c. 15
   d. 20
113. Regular physical activity is associated with improved health and reduced risk of overall mortality and has many bone health benefits, including reduced risk of osteoporosis and fractures.
   
a. True
b. False

114. The similarities in expression of the 2 risk factors, osteoporosis and elevated cholesterol, that suggest a program comparable to the National Cholesterol Education Program (NCEP) has the potential to be effective in improving bone health to include all of the following, except:
   
a. the first symptom of each usually goes unnoticed
b. osteoporosis is now and cholesterol was under detected and underdiagnosed
c. both require a 2-prong approach, e.g., lifestyle change and early detection and control
d. by knowing one’s number, the condition can be assessed and treated as needed

115. To address lactose intolerance among Asian Americans, the Living Healthy kit suggests that Asian-American women can include dietary alternatives such as:
   
a. tofu and soybeans
b. bok choy
c. seaweed
d. all of the above

116. In 1997, Missouri State survey data showed that ___% of the state’s population did not engage in adequate levels of physical activity.
   
a. 95
b. 80
c. 65
d. 35

117. New Jersey’s Project Healthy Bones was based on:
   
a. public awareness of the need for calcium and vitamin D supplements
b. the use of strength training exercises to improve bone density in older adults
c. physician education about osteoporosis
d. nutrition information to new mothers

118. Professional associations play a critical role in promoting bone health.
   
a. True
b. False

119. Fractures, especially in the elderly need to be thought of by both the public and practitioners as a sentinel event that probably signals:
   
a. the presence of a frail skeleton
b. increased risk of future fracture
c. an opportunity to intervene to prevent future fractures
d. all of the above
120. All health care professionals have a critical role to play in promoting the bone health of their patients by:

a. paying close attention to bone health issues when conducting wellness visits and treating people with other illnesses
b. emphasizing the basics of good bone health
c. recognizing red flags and risk factors that might signal the potential for osteoporosis and other bone diseases
d. all of the above