Bone Health and Osteoporosis

CHAPTER 1 – PUBLIC HEALTH APPROACH

1. Physical activity, calcium and __________ are known to be major contributors to bone health.
   a. Vitamin A
   b. Vitamin B12
   c. Vitamin D
   d. Vitamin C

2. Approximately how many fractures a year are caused by bone disease?
   a. 1.0 million
   b. 1.5 million
   c. 2.0 million
   d. 2.5 million

3. It is estimated that in 2020 one in two Americans over the age of ________ will have or be at risk for osteoporosis.
   a. 50
   b. 55
   c. 60
   d. 65

4. ________ out of every 10 white women age 50 or older in the United States will experience a hip, spine or wrist fracture in their lifetime.
   a. One
   b. Three
   c. Four
   d. Five

5. How many times greater is the mortality within the first 3 months after a hip fracture when compared to without a fracture?
   a. 1 - 3 times
   b. 1.5 – 3 times
   c. 2.5 – 3.8 times
   d. 2.8 – 4.0 times

6. What is the most important underlying cause of fractures in the elderly?
   a. Cancer
   b. Osteoporosis
   c. Paget’s disease
   d. Rickets

7. According to the World Health Organization there are roughly how many Americans over age 50 with osteoporosis?
   a. 4 million
   b. 7 million
   c. 10 million
   d. 12 million

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8. In 2002 what was the direct care expense range for osteoporosis fractures each year?
   a. 8.1 – 9.2 billion
   b. 10.2 – 11.4 billion
   c. 11.6 billion – 12.1 billion
   d. 12.2 billion – 17.9 billion

CHAPTER 2 – BASICS OF BONE

9. What two minerals are stored in the skeleton?
   a. Calcium and potassium
   b. Calcium and phosphorus
   c. Calcium and iron
   d. Calcium and sodium

10. Calcium and phosphorus are particularly critical to the function of the _______ and ________.
    a. Brain, kidneys
    b. Liver, lungs
    c. Nerves, muscle
    d. Heart, liver

11. Bone is composite material consisting of crystals of mineral bonded to what?
    a. Calcium
    b. Iron
    c. Protein
    d. Phosphorus

12. Collagen is made by what?
    a. Bone cells
    b. Blood cells
    c. Muscle cells
    d. Stem cells

13. What are the cells inside the bone called?
    a. Osteocytes
    b. Astrocytes
    c. Tanycytes
    d. Leukocytes

14. Abnormalities in the collagen scaffold can occur as a result of what genetic disorder?
    a. Osteomalacia
    b. Osteogenesis imperfecta
    c. Osteomyelitis
    d. Osteosarcoma

15. How much of the skeleton is made up of the dense outer shell called cortical bone?
    a. 1/4
    b. 1/2
    c. 2/3
    d. 3/4

16. Most bones are hollow structures.
    a. True
    b. False
17. What helps to maintain skeletal strength and integrity, and is particularly abundant in the spine and the ends of the long bones?
   a. Cortical bone  
   b. Trabecular bone  
   c. Short bones  
   d. Flat bones
18. What do bones provide as part of the musculoskeletal system that allows muscles to move?
   a. The lever  
   b. The structure  
   c. The strength  
   d. The system
19. What is the most common type of joint degeneration?
   a. Rheumatoid arthritis  
   b. Osteoarthritis  
   c. Psoriatic arthritis  
   d. Polyarthritis
20. How many processes guide the changes of size, shape and position of bone throughout life?
   a. 2  
   b. 3  
   c. 4  
   d. 5
21. What is it called when bone is formed at one site and broken down in a different site changing its shape and position?
   a. Resorption  
   b. Remodeling  
   c. Resurfacing  
   d. Restructuring
22. Remodeling prevents the accumulation of too much old ________.
   a. Cells  
   b. Bone  
   c. Minerals  
   d. Blood
23. Due to modeling and remodeling the adult skeleton is replaced about every ________ years.
   a. Three  
   b. Five  
   c. Ten  
   d. Twelve
24. What are the cells that form bone called?
   a. Osteoclasts  
   b. Osteoblasts  
   c. Osteopenia  
   d. Osteogenesis
25. What external factors are critical to keeping bones healthy?
   a. Vitamins, exercise
   b. Diet, exercise
   c. Drugs, genes
   d. Vitamins, genes

26. Parathyroid hormone (PTH) is produced by ______ small glands adjacent to the thyroid.
   a. 2
   b. 3
   c. 4
   d. 5

27. How many calcium regulating hormones play an important role in producing healthy bone?
   a. 1
   b. 2
   c. 3
   d. 4

28. Hyperparathyroidism can lead to what?
   a. Bone length
   b. Bone strength
   c. Bone pain
   d. Bone loss

29. Calcitriol is a hormone produced by what vitamin?
   a. Vitamin C
   b. Vitamin B12
   c. Vitamin D
   d. Vitamin A

30. What is the skeletal disorder characterized by compromised bone strength and an increased risk of fracture?
   a. Osteosarcoma
   b. Osteomyelitis
   c. Osteonecrosis
   d. Osteoporosis

CHAPTER 3 – DISEASES OF THE BONE

31. Secondary osteoporosis is the most common form of osteoporosis?
   a. True
   b. False – page 42, paragraph 1

32. Primary osteoarthritis is mainly a disease of what age group?
   a. Teens
   b. Young adults
   c. Adults
   d. Elderly
33. Juvenile osteoporosis affects previously healthy children between the ages of ____ and ____.
   a. 5, 8
   b. 5, 10
   c. 8, 14
   d. 9, 15

34. How many more times does age-related osteoporosis occur in women than men?
   a. 1 – 2 times
   b. 2 – 3 times
   c. 3 – 4 times
   d. 5 – 6 times

35. What percent of bone loss occurs in women during the rapid phase of cortical bone loss?
   a. 1 – 3%
   b. 5 – 10%
   c. 15 – 20%
   d. 25 – 30%

36. The rapid loss of bone largely results from the decrease of what hormone?
   a. Testosterone
   b. Estrogen
   c. Progesterone
   d. None of the above

37. What percent of elderly men are deficient in biologically active sex steroids?
   a. 10 – 15%
   b. 20 – 25%
   c. 30 – 50%
   d. 55 – 60%

38. Secondary osteoporosis is caused by a wide variety of diseases along with certain medications and toxic agents.
   a. True
   b. False

39. What are the most common diseases that can cause secondary osteoporosis?
   a. Idiopathic hypercalcemia
   b. Osteosarcoma
   c. Cystic fibrosis
   d. A&C

40. Glucocorticoid-induced osteoporosis occurs as a result of treating which of the following diseases?
   a. Rheumatoid arthritis
   b. Asthma
   c. Emphysema
   d. All the above

41. What condition results from a delay in depositing calcium in growing bone resulting in deformities, especially bowed legs?
   a. Paget’s disease
   b. Rickets
   c. Osteoarthritis
   d. Osteosarcoma
42. What is the most common cause of vitamin D reduction resulting in Rickets?
   a. Increased sun exposure
   b. Decreased sun exposure
   c. Phosphate deficiency
   d. Decreased hormone levels
43. What test is needed to diagnosis renal osteodystrophy?
   a. Blood test
   b. Renal ultrasound
   c. Renal CT scan
   d. Bone biopsy
44. Paget’s disease is the ________ most common bone disease.
   a. Second
   b. Third
   c. Fourth
   d. Fifth
45. What is the most common benign bone tumor?
   a. Osteoid osteoma
   b. Osteochondroma
   c. Giant cell tumor
   d. Enchondroma

CHAPTER 4 – THE FREQUENCY OF BONE DISEASE

46. What is the biggest problem caused by bone disease?
   a. Drug costs
   b. Deformities
   c. Surgery costs
   d. Fractures
47. Approximately ________ of fractures results in hospitalization.
   a. One-eighth
   b. One-fourth
   c. One-third
   d. One-half
48. What percent of women 85 and older fall each year?
   a. 12%
   b. 28%
   c. 33%
   d. 48%
49. What type of fracture is the most serious threat to white women and men over the age of 50?
   a. Wrist
   b. Spine
   c. Hip
   d. Rib
50. In the U.S the incidence of fracture for non-white ethnic groups is lower than that of whites.
   a. True
   b. False
51. By 2020, the risk of osteoporosis in Americans over the age of 50 is expected to be ______.
   a. One in two – page 77, paragraph 1
   b. Two out of three
   c. Three out of four
   d. Four out of five

52. What percentage of white postmenopausal women have osteoporosis of the hip, spine or forearm?
   a. 20%
   b. 25%
   c. 30%
   d. 35%

53. Women in what country are most likely to suffer fractures?
   a. United States
   b. Canada
   c. Mexico
   d. Sweden

54. Paget’s disease has been estimated at ______ per 100 women and men age 45-74.
   a. 1.0
   b. 1.1
   c. 1.2
   d. 1.3

55. What is the most frequent bone malignancy?
   a. Osteosarcoma
   b. Leukemia
   c. Chondrosarcoma
   d. Multiple myeloma

56. By 2050 how many people in the United States will be age 65 or older?
   a. 50 million
   b. 77 million
   c. 86 million
   d. 92 million

57. What is the estimated worldwide number of hip fractures in 2050?
   a. 2.3 million
   b. 4.5 million
   c. 6.3 million
   d. 7.2 million

CHAPTER 5 – THE BURDEN OF BONE DISEASE

58. In the NCHS study what percent of patients hospitalized with a hip fracture died?
   a. 4%
   b. 6%
   c. 7%
   d. 8%
59. How many physician office visits for fractures occurred in 1995?
   a. 1.0 million  
   b. 1.7 million  
   c. 2.6 million  
   d. 3.2 million

60. What percent of individuals suffering a hip fracture becomes disabled in the following year because of the fracture?
   a. 15%  
   b. 21%  
   c. 26%  
   d. 32%

61. The direct cost of osteoporosis fractures is paid primarily through Medicare and Medicaid.
   a. True  
   b. False

62. What is the age of the typical hip fracture patient?
   a. 70 years  
   b. 75 years  
   c. 80 years  
   d. 85 years

63. What percent of patients regain their previous ambulatory function a year after their fracture?
   a. 20 – 30%  
   b. 35 – 40%  
   c. 40 – 79%  
   d. 80 – 85%

64. What percentage of women who had one osteoporotic fracture thought having another would result in their having to enter a nursing home?
   a. 48%  
   b. 55%  
   c. 60%  
   d. 68%

65. Hip fracture survivors report what percent reduction in quality of life in the first 12 months?
   a. 41%  
   b. 52%  
   c. 61%  
   d. 68%

CHAPTER 6 – DETERMINANTS OF BONE HEALTH

66. Genetic factors are responsible for determining what percentage of bone mass?
   a. 20-40%  
   b. 25-55%  
   c. 45-85%  
   d. 50-90%
67. Diet and physical activity are responsible for what percentage of bone mass and structure?
   a. 5-20%
   b. 10-50%
   c. 15-55%
   d. 20-60%

68. A 10 percent increase in bone mass could reduce fracture risk by as much as what percent?
   a. 30%
   b. 40%
   c. 50%
   d. 60%

69. What percent of Asian-Americans are lactose intolerant?
   a. 70%
   b. 85%
   c. 90%
   d. 95%

70. What is the tolerable upper limit for calcium per day?
   a. 2,000 mg
   b. 2,500 mg
   c. 3,000 mg
   d. 3,500 mg

71. What vitamin aids in the absorption and utilization of calcium?
   a. Vitamin C
   b. Vitamin D
   c. Vitamin A
   d. Vitamin B12

72. Which of the following can result from too much vitamin D?
   a. Hypercalcemia
   b. Kidney failure
   c. Soft tissue calcification
   d. All the above

73. Low birth weight is not associated with low bone mass later in life.
   a. True
   b. False

74. What percent of the body’s phosphorus in found in the skeleton?
   a. 65%
   b. 75%
   c. 85%
   d. 95%

75. Which of the following may have a negative effect in calcium balance?
   a. Caffeine
   b. Protein
   c. Potassium
   d. A & B
76. What percent of people 12-21 report not exercising at all?
   a. 10%
   b. 15%
   c. 20%
   d. 25%

77. Walking at least 4 hours per week was associated with ______ percent lower risk of hip fracture compared to walking less than an hour per week.
   a. 35%
   b. 37%
   c. 41%
   d. 47%

78. What percent of total body adult bone mass is gained during puberty?
   a. 5-10%
   b. 15-20%
   c. 25-30%
   d. 35-40%

79. What activity is particularly effective and results in greatest gains during early or mid-puberty?
   a. Running
   b. Jumping
   c. Weight lifting
   d. A & C

80. What exercise increased bone mineral density at both the hip and spine in adults?
   a. Jogging
   b. Walking
   c. Weight lifting
   d. Jumping

81. What is one of the biggest bone-related problems facing frail elderly people?
   a. Pain
   b. Loss of muscle
   c. Loss of mobility
   d. Arthritis

82. What percent of muscle mass is lost each decade after age 30?
   a. 3%
   b. 4%
   c. 5%
   d. 6%

83. What percent of falls in the elderly result in a fracture?
   a. 10-15%
   b. 20-30%
   c. 35-40%
   d. 45-50%
CHAPTER 7 – LIFESTYLE APPROACHES TO PROMOTE BONE HEALTH

84. How many international units (IU) of vitamin D is in one cup of fortified milk?
   a. 25 IU
   b. 50 IU
   c. 75 IU
   d. 100 IU

85. Which of the following are aspects of a bone-healthy lifestyle?
   a. Maintain healthy body weight
   b. Avoid smoking
   c. Drink alcohol in moderation
   d. All the above

CHAPTER 8 – ASSESSING THE RISK OF BONE DISEASE AND FRACTURE

86. What is one of the most important red-flags that an individual may have osteoporosis?
   a. Previous fracture
   b. Previous neck pain
   c. Previous hip pain
   d. Previous wrist pain

87. Which of the following red flags warrant further assessment?
   a. Family history of bone disease
   b. Low body weight
   c. Anorexia nervosa
   d. All the above

88. Bone mineral density testing is the gold standard to identify osteoporosis.
   a. True
   b. False

89. What is the sensitivity of the Osteoporosis Risk Assessment Instrument?
   a. 93%
   b. 94%
   c. 95%
   d. 96%

90. What is the 5-year hip fracture rate for 70-79-year-old women with a T-score of 2?
   a. 1.1
   b. 2.3
   c. 4.2
   d. 4.6

91. Hip fracture was how many times greater among the 15 percent of women who had five or more risk factors?
   a. 13 times
   b. 15 times
   c. 17 times
   d. 19 times
92. What is the percent increased risk for women who have a family history of maternal hip fracture?
   a. 80%
   b. 82%
   c. 84%
   d. 85%

93. Poor vision is **not** a particularly important risk factor for the elderly.
   a. True
   b. False

94. For each standard deviation decrease in BMD the risk of fracture increases how many times?
   a. 0.05 – 1.0 times
   b. 1.25 – 1.45 times
   c. 1.50 – 2.5 times
   d. 3.0 – 3.5 times

95. What percent of bone loss is needed to be seen on an x-ray?
   a. 20%
   b. 25%
   c. 30%
   d. 35%

96. At what age should all women have a BMD test?
   a. 55 years
   b. 65 years
   c. 70 years
   d. 75 years

97. Which of the following risk factors would justify screening younger postmenopausal women?
   a. Family history of osteoporosis and current cigarette smoking
   b. Personal history of low-trauma fracture
   c. Low body weight
   d. All the above

98. A DXA scan measures bone density of what two areas?
   a. Hip and spine
   b. Hip and wrist
   c. Wrist and spine
   d. None of the above

99. A normal DXA is a hip BMD that is not more than _____standard deviation below the young adult female reference mean.
   a. 1
   b. 1.5
   c. 2.0
   d. 3.5
CHAPTER 9 – PREVENTION AND TREATMENT

100. What term refers to actions that prevent a disease or injury that could lead to a state of impairment?
   a. Primary prevention
   b. Secondary prevention
   c. Tertiary prevention
   d. Triennial prevention

101. Anabolic agents are drugs that do what?
   a. Reduce bone loss
   b. Build bone
   c. Increase hormone levels
   d. Reduce pain

102. What year did the FDA approve estrogen to treat postmenopausal osteoporosis?
   a. 1967
   b. 1972
   c. 1978
   d. 1983

103. What is the most common treatment for a hip fracture?
   a. Traction
   b. Bedrest
   c. Surgery
   d. Physical therapy

104. Spine fractures usually occur in what section of the back?
   a. Upper
   b. Middle
   c. Lower
   d. Middle and lower

CHAPTER 10 – PUTTING IT ALL TOGETHER

105. The largest influx of calcium into the fetal skeleton occurs during what trimester?
   a. First
   b. Second
   c. Third
   d. Second and third

106. What is the recommended amount of calcium per day for a child between 1 and 3 years old?
   a. 100 mg
   b. 500 mg
   c. 700 mg
   d. 800 mg

107. What is the recommended daily vitamin D requirement during childhood?
   a. 50 IU
   b. 100 IU
   c. 150 IU
   d. 200 IU
108. Which of the following vegetables are recommended for maximum calcium nutrition?
   a. Broccoli
   b. Kale
   c. Carrots
   d. A & B

109. How much vitamin D is in an egg yolk?
   a. 10 IU
   b. 15 IU
   c. 25 IU
   d. 35 IU

CHAPTER 11 – SYSTEM-BASES APPROACH TO BONE HEALTH

110. The two aspects of the knowledge stage for new innovation are consumer awareness and clinician’s awareness of best practices for bone health.
   a. True
   b. False

111. What is a common system-based approach that assists physicians in practicing evidence-based medicine?
   a. Paper check list
   b. Computerized reminder system
   c. Educational seminar
   d. Chart flags

112. Which of the following are risk factors eligible for Medicare and Medicaid coverage for BMD testing?
   a. Estrogen deficiency
   b. Primary hyperparathyroidism
   c. Spine fracture
   d. All the above

113. What is one of the most important roles for voluntary advocacy groups?
   a. Raise money
   b. Petition law makers
   c. Raise public awareness
   d. Organize exercise classes

114. One of the roles of academia is to advance research on bone health.
   a. True
   b. False

CHAPTER 12 – POPULATION-BASED APPROACH

115. Population-based health intervention includes which of the following?
   a. Assessment and health promotion
   b. Disease prevention, monitoring and prevention
   c. Insurance coverage
   d. A & B
116. What is the most effective population-based approach?
   a. Individual level initiative
   b. Population level initiative
   c. Government level initiative
   d. A & B

117. What is the standardized assessment of an entire body of evidence for a specific intervention known as?
   a. Standardized reviews
   b. Systematic reviews
   c. Systemic reviews
   d. Subsequent reviews

118. What state was one of the first to develop a program oriented to osteoporosis?
   a. Texas
   b. Florida
   c. California
   d. North Carolina

CHAPTER 13 – VISION FOR THE FUTURE

119. More needs to be done to change the perception that osteoporosis is an inevitable part of aging.
   a. True
   b. False

120. What should fracture in the elderly be thought of as by the public and practitioners?
   a. An accident
   b. Preventable incident
   c. Sentinel event
   d. Unfortunate accident