

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

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

CHAPTER 2 – BASICS OF BONE

9. What two minerals are stored in the skeleton?
- Calcium and potassium
 - Calcium and phosphorus
 - Calcium and iron
 - Calcium and sodium
10. Calcium and phosphorus are particularly critical to the function of the _____ and _____.
- Brain, kidneys
 - Liver, lungs
 - Nerves, muscle
 - Heart, liver
11. Bone is composite material consisting of crystals of mineral bonded to what?
- Calcium
 - Iron
 - Protein
 - Phosphorus
12. Collagen is made by what?
- Bone cells
 - Blood cells
 - Muscle cells
 - Stem cells
13. What are the cells inside the bone called?
- Osteocytes
 - Astrocytes
 - Tanocytes
 - Leukocytes
14. Abnormalities in the collagen scaffold can occur as a result of what genetic disorder?
- Osteomalacia
 - Osteogenesis imperfecta
 - Osteomyelitis
 - Osteosarcoma
15. How much of the skeleton is made up of the dense outer shell called cortical bone?
- 1/4
 - 1/2
 - 2/3
 - 3/4
16. Most bones are hollow structures.
- True
 - False

17. What helps to maintain skeletal strength and integrity, and is particularly abundant in the spine and the ends of the long bones?
- Cortical bone
 - Trabecular bone
 - Short bones
 - Flat bones
18. What do bones provide as part of the musculoskeletal system that allows muscles to move?
- The lever
 - The structure
 - The strength
 - The system
19. What is the most common type of joint degeneration?
- Rheumatoid arthritis
 - Osteoarthritis
 - Psoriatic arthritis
 - Polyarthritis
20. How many processes guide the changes of size, shape and position of bone throughout life?
- 2
 - 3
 - 4
 - 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?
- Resorption
 - Modeling
 - Resurfacing
 - Restructuring
22. Remodeling prevents the accumulation of too much old _____.
- Cells
 - Bone
 - Minerals
 - Blood
23. Due to modeling and remodeling the adult skeleton is replaced about every _____ years.
- Three
 - Five
 - Ten
 - Twelve
24. What are the cells that form bone called?
- Osteoclasts
 - Osteoblasts
 - Osteopenia
 - 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
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 ____.
- 5, 8
 - 5, 10
 - 8, 14
 - 9, 15
34. How many more times does age-related osteoporosis occur in women than men?
- 1 – 2 times
 - 2 – 3 times
 - 3 – 4 times
 - 5 – 6 times
35. What percent of bone loss occurs in women during the rapid phase of cortical bone loss?
- 1 – 3%
 - 5 – 10%
 - 15 – 20%
 - 25 – 30%
36. The rapid loss of bone largely results from the decrease of what hormone?
- Testosterone
 - Estrogen
 - Progesterone
 - None of the above
37. What percent of elderly men are deficient in biologically active sex steroids?
- 10 – 15%
 - 20 – 25%
 - 30 – 50%
 - 55 – 60%
38. Secondary osteoporosis is caused by a wide variety of diseases along with certain medications and toxic agents.
- True
 - False
39. What are the most common diseases that can cause secondary osteoporosis?
- Idiopathic hypercalcemia
 - Osteosarcoma
 - Cystic fibrosis
 - A&C
40. Glucocorticoid-induced osteoporosis occurs as a result of treating which of the following diseases?
- Rheumatoid arthritis
 - Asthma
 - Emphysema
 - All the above
41. What condition results from a delay in depositing calcium in growing bone resulting in deformities, especially bowed legs?
- Paget's disease
 - Rickets
 - Osteoarthritis
 - Osteosarcoma

42. What is the most common cause of vitamin D reduction resulting in Rickets?
- Increased sun exposure
 - Decreased sun exposure
 - Phosphate deficiency
 - Decreased hormone levels
43. What test is needed to diagnosis renal osteodystrophy?
- Blood test
 - Renal ultrasound
 - Renal CT scan
 - Bone biopsy
44. Paget's disease is the _____ most common bone disease.
- Second
 - Third
 - Fourth
 - Fifth
45. What is the most common benign bone tumor?
- Osteoid osteoma
 - Osteochondroma
 - Giant cell tumor
 - Enchondroma

CHAPTER 4 – THE FREQUENCY OF BONE DISEASE

46. What is the biggest problem caused by bone disease?
- Drug costs
 - Deformities
 - Surgery costs
 - Fractures
47. Approximately _____ of fractures results in hospitalization.
- One-eighth
 - One- fourth
 - One- third
 - One-half
48. What percent of women 85 and older fall each year?
- 12%
 - 28%
 - 33%
 - 48%
49. What type of fracture is the most serious threat to white women and men over the age of 50?
- Wrist
 - Spine
 - Hip
 - Rib
50. In the U.S the incidence of fracture for non-white ethnic groups is lower than that of whites.
- True
 - False

51. By 2020, the risk of osteoporosis in Americans over the age of 50 is expected to be _____.
- One in two
 - Two out of three
 - Three out of four
 - Four out of five
52. What percentage of white postmenopausal women have osteoporosis of the hip, spine or forearm?
- 20%
 - 25%
 - 30%
 - 35%
53. Women in what country are most likely to suffer fractures?
- United States
 - Canada
 - Mexico
 - Sweden
54. Paget's disease has been estimated at _____ per 100 women and men age 45-74.
- 1.0
 - 1.1
 - 1.2
 - 1.3
55. What is the most frequent bone malignancy?
- Osteosarcoma
 - Leukemia
 - Chondrosarcoma
 - Multiple myeloma
56. By 2050 how many people in the United States will be age 65 or older?
- 50 million
 - 77 million
 - 86 million
 - 92 million
57. What is the estimated worldwide number of hip fractures in 2050?
- 2.3 million
 - 4.5 million
 - 6.3 million
 - 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?
- 4%
 - 6%
 - 7%
 - 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 is 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?
- 25 IU
 - 50 IU
 - 75 IU
 - 100 IU
85. Which of the following are aspects of a bone-healthy lifestyle?
- Maintain healthy body weight
 - Avoid smoking
 - Drink alcohol in moderation
 - 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?
- Previous fracture
 - Previous neck pain
 - Previous hip pain
 - Previous wrist pain
87. Which of the following red flags warrant further assessment?
- Family history of bone disease
 - Low body weight
 - Anorexia nervosa
 - All the above
88. Bone mineral density testing is the gold standard to identify osteoporosis.
- True
 - False
89. What is the sensitivity of the Osteoporosis Risk Assessment Instrument?
- 93%
 - 94%
 - 95%
 - 96%
90. What is the 5-year hip fracture rate for 70-79-year-old women with a T-score of 2?
- 1.1
 - 2.3
 - 4.2
 - 4.6
91. Hip fracture was how many times greater among the 15 percent of women who had five or more risk factors?
- 13 times
 - 15 times
 - 17 times
 - 19 times

92. What is the percent increased risk for women who have a family history of maternal hip fracture?
- 80%
 - 82%
 - 84%
 - 85%
93. Poor vision **is not** a particularly important risk factor for the elderly.
- True
 - False
94. For each standard deviation decrease in BMD the risk of fracture increases how many times?
- .05 – 1.0 times
 - 1.25 – 1.45 times
 - 1.50 – 2.5 times
 - 3.0 – 3.5 times
95. What percent of bone loss is needed to be seen on an x-ray?
- 20%
 - 25%
 - 30%
 - 35%
96. At what age should all women have a BMD test?
- 55 years
 - 65 years
 - 70 years
 - 75 years
97. Which of the following risk factors would justify screening younger postmenopausal women?
- Family history of osteoporosis and current cigarette smoking
 - Personal history of low-trauma fracture
 - Low body weight
 - All the above
98. A DXA scan measures bone density of what two areas?
- Hip and spine
 - Hip and wrist
 - Wrist and spine
 - 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.
- 1
 - 1.5
 - 2.0
 - 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?
- Primary prevention
 - Secondary prevention
 - Tertiary prevention
 - Triennial prevention
101. Anabolic agents are drugs that do what?
- Reduce bone loss
 - Build bone
 - Increase hormone levels
 - Reduce pain
102. What year did the FDA approve estrogen to treat postmenopausal osteoporosis?
- 1967
 - 1972
 - 1978
 - 1983
103. What is the most common treatment for a hip fracture?
- Traction
 - Bedrest
 - Surgery
 - Physical therapy
104. Spine fractures usually occur in what section of the back?
- Upper
 - Middle
 - Lower
 - Middle and lower

CHAPTER 10 – PUTTING IT ALL TOGETHER

105. The largest influx of calcium into the fetal skeleton occurs during what trimester?
- First
 - Second
 - Third
 - Second and third
106. What is the recommended amount of calcium per day for a child between 1 and 3 years old?
- 100 mg
 - 500 mg
 - 700 mg
 - 800 mg
107. What is the recommended daily vitamin D requirement during childhood?
- 50 IU
 - 100 IU
 - 150 IU
 - 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?
- Individual level initiative
 - Population level initiative
 - Government level initiative
 - A & B
117. What is the standardized assessment of an entire body of evidence for a specific intervention known as?
- Standardized reviews
 - Systematic reviews
 - Systemic reviews
 - Subsequent reviews
118. What state was one of the first to develop a program oriented to osteoporosis?
- Texas
 - Florida
 - California
 - 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.
- True
 - False
120. What should fracture in the elderly be thought of as by the public and practitioners?
- An accident
 - Preventable incident
 - Sentinel event
 - Unfortunate accident