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Extension - Health and
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IEHA Program Lesson Submission

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Month/Year Materials Created:	September 2022
Topic Title:	Bone Health: Rock-Solid Aging
Topic Description: (Information should be researched, educational, approved for use (if you are not the author, seek approval from materials author), and presented in a format that would allow an individual to read, study, and teach to other peers. All copyright issues should be resolved before submission.)	Understand the components of bone health and how to make sure your bones are healthy.
Short Goal/Objective Statement for Lesson:	1) The Importance of Bone Health 2) Bone Density 3) Osteoporosis 4) Prevention and treatment

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Why is Bone Health Important?

- Provide shape and support for the body
- Provide protection for our internal organs
- Enable movement of the body
- Produce our blood cells
- Provide energy storage
- Provide a ready source of calcium and phosphorus

Fun Fact: 99% of our calcium is in our bones. 85%-90% of our phosphorous is in our bones

Bone Remodeling:

- Our bodies are constantly building and breaking down bone
- The lifelong process of bone formation and bone resorption by bone cells
- Osteoblasts build and form bone
- Osteoclasts absorb and break down bone

Fun Fact: Our skeleton replace themselves around every 10 years!

What is Bone Mineral Density?

- A measure of the amount of bone mineral in the bones
- Also called bone density, BMD, bone mass
- BMD= bone formation + resorption
- Currently no accurate measure of overall bone strength - BMD used to measure bone strength
- Accounts for ~70% of bone strength - used as a measure of bone strength
- Bone density gradually decreases after peak density (around age 30) is reached

Fun Fact: Peak bone mass is largely genetically determined, with genetics explaining up to 80% of individual variation

What is Osteoporosis?

- A disease characterized by low bone density, deterioration of bone tissue, and compromised bone strength
- Leads to weak and brittle bones
- “porous bone”
- Most common bone disease
- Can be caused by both:
 - A failure to build bone and reach peak bone mass as a young adult
 - Bone loss later in life
 - Increases susceptibility to fracture and morbidity
 - Resulting in pain, loss of height, disability, and the inability to live independently

Impact of Osteoporosis:

- More than 8 million women and 0.8 million men in the US have osteoporosis
- Osteoporosis is more common among older adults due to the cumulative impact of bone mineral loss and deterioration of bone structure that occur with aging
- 1.5 million older adults in the US suffer fractures caused by osteoporosis each year

Fun Fact: Common fractures sites are the hip, spine, wrist, and forearm.

Primary vs Secondary Osteoporosis:

- **Primary** – osteoporosis that occurs with aging
- **Secondary** – osteoporosis caused by certain medical conditions or medications causing bone loss, increased fracture risk, affecting bone remodeling, or interfering with peak bone mass in younger years

Non- Modifiable Risk Factors

- **Age** – risk increases as we age
- **Ethnicity** – white and Asian women at highest risk
- **Family history** – osteoporosis tends to run in families
- **Sex** – women develop osteoporosis more often than men
- **History of fracture** – increases risk for another fracture
- **Reproductive history** – estrogen deficiency promotes osteoclast formation

Modifiable Risk Factors

- **Alcohol intake** - high intake can lead to bone loss
- **Bodyweight** – lower bodyweight linked to increased risk
- **Diet and supplement intake** – vitamin D and calcium
- **History of falls** – increases risk of future falls
- **Medication** – some medications increase risk
- **Physical activity** – can increase bone density and prevent falls
- **Smoking** – linked to decreased bone density
- **Sunlight exposure** – increased vitamin D
- **Visual health** – poor vision can lead to falls

Symptoms of Osteoporosis:

- Osteoporosis is a silent disease – low bone density is painless and without signs and symptoms
- Physical symptoms are only apparent after osteoporotic fractures have occurred
- Screening is vital for detection of osteoporosis

Diagnosis of Osteoporosis:

- Bone densitometry – measure of bone mineral density
 - DEXA scan – gold standard

BMD testing is recommended for:

- Women ≥ 65 and men ≥ 70
- Younger postmenopausal women, women in the menopause transition
- Men aged 50-69 and women under age 65 with clinical risk factors
 - Ex: high alcohol intake, smoking, loss of height, family history, eating disorders, rheumatoid arthritis or CKD
- Adults who experience a fracture after age 50
- Adults with a condition or taking a medication with low bone mass or bone loss

Fun Fact: Covered for qualified clients under Medicare Part B as part of the Bone Measurement Act once every 2 years if you are at risk

Treatment for Osteoporosis:

- Goal of treatment is to reduce the risk of fracture
 - Fall prevention
- Medications are the first line of treatment
- Food and exercise play an important, but solely supportive, role

Fall Reduction Strategies:

- Increase bone density through medication, weight-bearing exercise, and a bone-healthy diet
- Posture and balance training
- Regular eye exams, proper footwear, use of assistive devices
- Fall-proof surroundings
- Attending fall prevention classes such as “Matter of Balance” offered by HHS Educators (ask for more information)!

What can I do to prevent osteoporosis?

- Consume a healthful diet – focusing on adequate vitamin D, calcium, protein, fruit, vegetable and fluid intake, along with minimized sodium intake
- Be active!
- Avoid excess use of alcohol and tobacco
- Regular bone density testing
- Work with your healthcare team!

Sources:

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Healthy bone (top) vs Osteoporotic bone (bottom)

