Overview

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Definition

Breakdown

Osteo- means to do with bones
Porosis- means a porous condition

Osteoporosis- Means “Porous Bones”
Osteoporosis- is a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue leading to bone fragility and increased risk of fracture.
Definition

Video
Epidemiology

Estimated 10 million Americans have osteoporosis
  • 80% Woman
  • 20% Men

Most common in Post menopausal woman

34 million Americans have low bone mass

Likelihood of having an Osteoporotic fracture in lifetime after age 50:
  • 1 in 2 woman 50%
  • 1 in 4 men  25%
Clinical Aspects

Symptoms
• Pain/ Joint pain
• Swelling
• Falling
• Poor posture
• Loss of Height

People may not know they have Osteoporosis until they fall

Risk Factors
• Gender (female)
• Older Age
• Family History
• Low Estrogen Levels in Woman
• History of Fractures
• Inadequate physical activity
• Smoking
• Alcohol consumption
• Low dietary calcium intake
• Vitamin D insufficiency
• Certain medications
• Certain Diseases and Conditions
Diagnosis

- Bone Densitometry
  - Bone Mineral Density (BMD) measured by Central Dual-Energy X-ray
- Ultra Sound
- Quantitative Computed Tomography (qCT Scan)

T-score > -1 BMD is normal
T-score -1 to -2.5 BMD low bone mass
T-score -2.5 or less osteoporosis

[Central Dual Energy Xray Video]
Treatment

• Therapeutic Options
  • Hormone therapies (HT)
• Medications
  • Antiresorptive Medications: Bisphosphates-
  • Bone Forming Medications
    • For high fracture risk
• Wear brace for support

No cure for low bone mass or osteoporosis— but successful management is possible!
Effects on Exercise

Limitations
- Orthopedic Limitations
- Limited locomotor abilities
- Poor Balance
- Fear of falling
- More prone to fall
- Deconditioned
- Pain in joints
Effects on Exercise

Effects of Exercise Training

- up to 1 year walking programs have shown preservation of BMD
- Jumping exercise increase hip BMD while HT in premenopausal woman
- exercise can improve and maintain BMD in men
- exercise reduces risk of falling
Exercise Testing

Aerobic Testing
• Cycle testing: 3 Min Stage
• Treadmill: can be unsafe
• Measure: BP, RPE (6-20), METs, 12-lead ECG, HR

Strength
• Weight machines
• Free weights
• Handheld Dynamometer

Neuromuscular
• Gait test
• Balance Test

Endpoint: Pain or fatigue
Exercise Testing

**Functional**
- 6 minute walk: Distance
- Tandem gait speed: Speed
- Step Test: Count
- Timed Chair sit to Stand: Try without use of arms

**ADL/ Functional Performance Tests**
- ADL- activities of daily living

**Posture**
- Flexicurve to determine index of kyphosis (IK) (hump on back)

**Endpoint:** pain or fatigue
**Aerobic Mode**

- Large muscle activity: walking, cycling, swimming, water walking

**Goal**
- Maintain bone mass
- Improve and maintain work capacity

**Intensity/Frequency/Duration**
- 40-70% peak HR
- 3-5 days/week
- 30-60 min/sessions
Exercise Prescription

**Strength Mode**
- Dumbbells
- Weight machines
- Cuff weights
- Floor calisthenics
- Vibrating machines

**Goals**
- Improve strength
- Improve posture
- Maintain Bone Mass
- Decrease fall Risk

**Intensity/Frequency/Duration**
- 75% of 1RM, 8-12 reps
- 2 sets of 8-10 reps
- 2-3 days/week
- 20-40 min
Exercise Prescription

**Flexibility**

**Mode**
- Stretching
- Chair exercises

**Goals**
- Increase ROM

**Intensity/Frequency/Duration**
- 5-7 days a week

**Functional**

**Mode**
- Activity Specific exercises
- Brisk Walking
- chair sit to stand
- Balancing Exercises

**Goals**
- Increase Maintain ADLs
- Improve Balance
- Decrease fall Risk

**Duration**
- 3-5 days/week
- 2-3 days/week
Summary

- Osteoporosis means “Porous Bones”
- Estimated 10 million Americans have Osteoporosis
- 80% woman 20% men
- 34 million Americans have low bone density
- Risk Factors can be age, gender, Family History, History of falls, low estrogen levels in woman, smoking, alcohol consumption... Etc
- BMD diagnoses is based from T-scores
  - T-score > -1 BMD is normal
  - T-score -1 to -2.5 BMD low bone mass
  - T-score -2.5 or less osteoporosis
- Medication is the usual treatment
- Exercise has shown to maintain bone mineral density
Senior Fitness Test
References


