Osteoporosis and Osteopenia

Bourassa and Associates Rehabilitation Centre
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Ask the Experts
What is Osteoporosis?

- A disease involving low bone mass and deterioration of the architecture of the bone
- This can lead to increased bone fragility and an increased risk of bone fracture
- In osteoporotic individuals, fragility fractures most often occur in the spine, wrist and hip.
What is Osteopenia?

- Osteopenia is a condition in which bone mineral density is lower than normal.
- It can present as a precursor to osteoporosis.
- Bone mass peaks as a young adult, therefore, it is the normal aging process to experience a decrease in bone mass. However, it is not considered a normal physiological change for bone loss to reach the level of osteoporosis and low-impact fracture.
• Bone density scans can provide diagnostic evidence as to the degree of bone loss.

• Osteoporosis is defined by the World Health Organization as bone mineral density equal to or more than 2.5 standard deviations below the mean for normal, white women.

• In 2003, the prevalence of osteoporosis at the hip, spine or distal forearm among postmenopausal, white women was about 40%.
Risk Factors for Osteoporotic Fracture

- Personal history of a low-impact fracture
- Low bone mineral density
- Advanced age
- Female
- Estrogen deficiency
- Low body weight (<127 lbs)
- Caucasian race
- Low lifetime calcium intake
- Inadequate physical activity
Further Risk Factors for an Osteoporotic Fracture

- Dementia
- Recurrent falls
- Poor health/frailty
- Current smoker
- Excessive alcohol consumption
- Impaired eyesight
- Family history of osteoporosis
Osteoporosis in Males

- An area of decreased focus
- Continues to be underdiagnosed and inadequately treated in males
- However, men comprise 1/5 of individuals with osteoporosis
- Men have an increased rate of mortality following a hip fracture
Osteoporosis
Impact of Osteoporosis

- **Low Impact Fractures**
  - Decreased force required to fracture the fragile bone
  - Fragility fractures most often occur in the spine (vertebrae), wrist (distal forearm) and hip (proximal femur)
Hip fracture due to osteoporosis

Femoral head
Diseased bone
Femur
(cross section)
Impact of Osteoporosis

- Postural Abnormalities
Impact of Osteoporosis

• **Strength and Flexibility**
  - *Decreased strength and flexibility associated with postural abnormalities.*

• **Balance**
  - *Decreased balance increases fall (and fracture) risk*
  - *Osteoporotic individuals utilize balance strategies at hips, while normal, age-matched individuals use strategies at ankles. This results in increased sway and a decreased ability to regain balance. Research has indicated that balance improvements can be made with training.*
Rehabilitation
Following Fracture

• *Hip Fracture*
  - *Progressive range of motion and strengthening of hip and lower extremity*
  - *Transfer, gait and balance retraining*
Rehabilitation Following Fracture

• **Vertebral Fracture**
  - Core, spinal and shoulder girdle strengthening
  - Spinal range of motion
  - Teaching safe movements
  - Balance retraining

• **Distal Forearm Fracture**
  - Fracture of radius, ulna or both
  - Following bony union (which may be delayed), progressive range of motion and strength retraining
Exercise and Osteoporosis

- Osteoporosis and osteopenia are progressive conditions; meaning as time passes the severity of the condition can increase.

- Medication, diet alterations and vitamin supplements are forms of treatment.

- In conjunction, guided exercise can decrease the progressive nature of these conditions.
Exercise and Osteoporosis

Research demonstrates that the benefits of an exercise program for individuals with osteoporosis and osteopenia are widespread, including the following:

- Decreased risk of falling
- Improved bone mass
- Improved muscles strength
- Better balance
- Better posture
- Increased tissue flexibility
- Improved aerobic fitness
- Better quality of life
Exercise and Osteoporosis

An exercise regime for individuals with osteoporosis and osteopenia should include the following:

- **Balance retraining to decrease fall risk**
- **Stretching and strengthening exercises to deviate from postural abnormalities**
- **General strengthening exercise for the entire body to promote bone formation**
Safe Movements

- Osteoporotic individuals should avoid movements that place high load forces on spine
- Forward bending (flexion) and twisting (rotation), especially when lifting or carrying objects
- Avoid combination movements of flexing and rotating through the spine
Bourassa and Associates Programs

- Exercise programs for prevention and improvement in osteoporosis
- Balance retraining and fall risk prevention
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