

# Safe & Effective Exercises for Osteoporosis

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## OBJECTIVES

Following this session, you will be able to:

- Describe how physical activity and exercise can benefit a person with or at risk of osteoporosis and fracture
- Identify exercises to:
  - improve/maintain bone density
  - improve posture and body mechanics
  - improve balance to help prevent falls
- Review safe movements with osteoporosis

## HANDOUTS

Several handouts will be available:

- Important facts
- Ways to improve bone health
- Prevent falls
- Calcium-rich foods
- Bone basics: Who gets osteoporosis
- Bone basics: Vertebral fractures

## Overview of Osteoporosis

- Affects 53 million Americans
  - 10 million have osteoporosis
  - 43 million have low bone mass  
(Clinician's Guide to the Prevention and Treatment of Osteoporosis, NOF, 2014)
  - More than 2 million men have osteoporosis
- Osteoporosis is responsible for > 2 million fractures each year

## Osteoporosis Can Cause Any Bone to Break

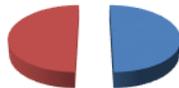
- The 3 most common sites for fractures:

- Spine
- Wrist
- Hip



## The Risk of Breaking a Bone- A Serious Healthcare Threat

- 1 out of 2 women aged  $\geq 50$  yrs



- 1 out of 4 White men aged  $\geq 50$  yrs

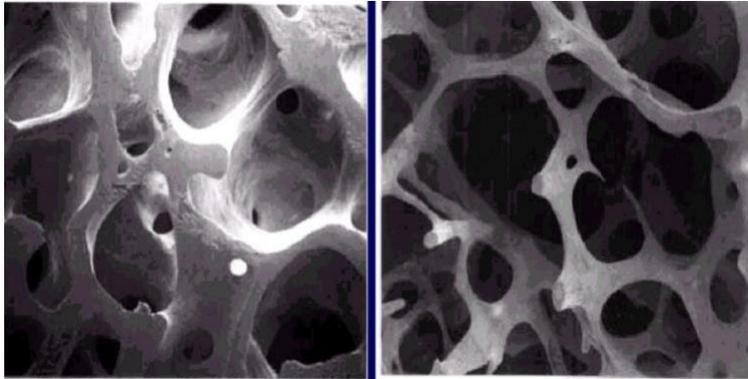


- Men suffer fewer fractures, but have twice the 1-yr mortality compared to women

(Clinician's Guide to the Prevention and Treatment of Osteoporosis, NOF, 2014)

## Osteoporosis is a Silent Disease

- You can't see or feel your bones getting thinner

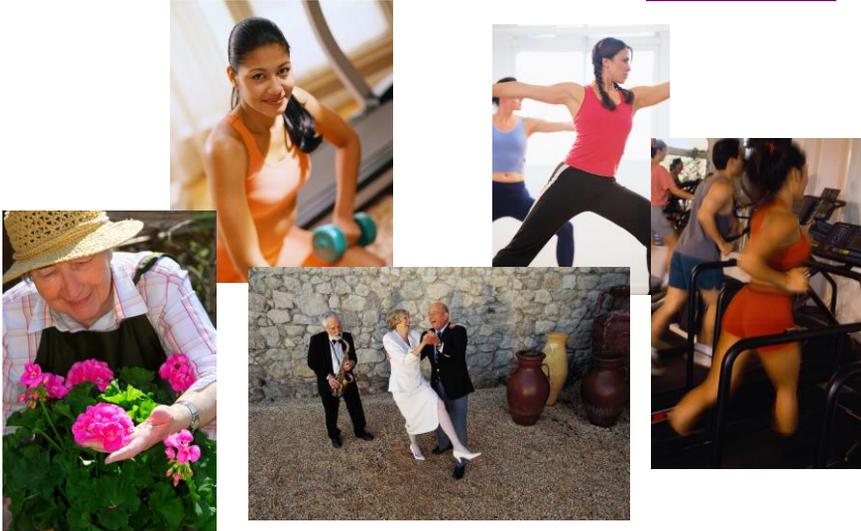


## Lifestyle Changes to Reduce Fractures

- **Exercise**
- Calcium
- Vitamin D
- Don't smoke
- Don't drink too much
- Medications if indicated

(Clinician's Guide to the Prevention and Treatment of Osteoporosis, NOF, 2014)

## Exercise and Physical Activity for Bone Health



## What Types of Exercise Improve Bone Health?

Several types of exercises are important for bone health, including those that:

- Make bones stronger
- Improve posture and body mechanics
- Improve balance to help prevent falls

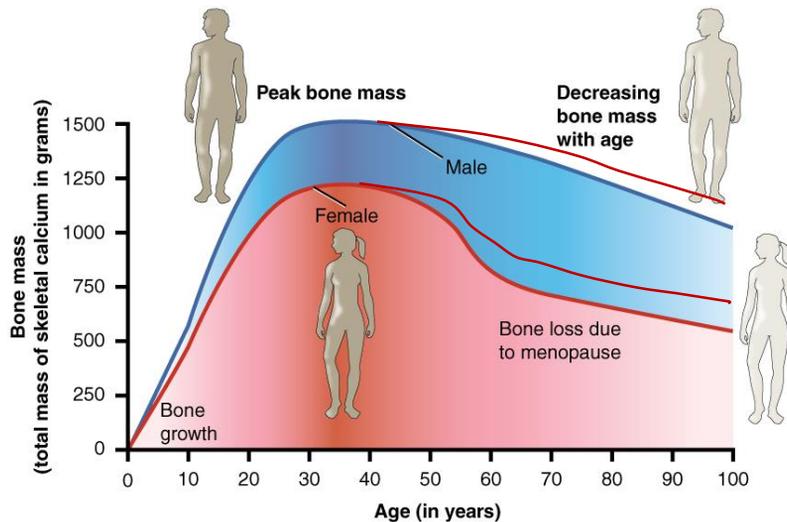
## EXERCISE AND BONE DENSITY/STRENGTH

### What Types of Exercise Make Bones Stronger?

Two types of exercises that improve bone strength are:

- Weight-bearing exercises which make you work against gravity while being upright, such as brisk walking.
- Muscle-strengthening exercises which make you move your body, a weight or some other resistance against gravity, such as lifting weights; also called resistance exercises.

## What Can You Expect for Change?



## Some Examples of Weight-bearing Exercises

### High-impact exercises:

- Dancing
- High-impact aerobics
- Hiking
- Jogging/running
- Jumping Rope
- Stair climbing
- Tennis
- Volleyball

### Low-impact exercises:

- Elliptical training machines
- Stair-step machines
- Low impact aerobics
- Walking on a treadmill
- Walking on level surfaces (such as mall walking or outdoors)

## Weight-bearing Exercises

**Let's do some  
heel drops.**

## How Much Weight-bearing Exercise Should You Do?

- Children and adolescents: 60 minutes of moderate to vigorous activity every day, including high-impact activities
- Adults: 150 minutes per week of moderate or 75 minutes per week of vigorous activity, including impact activities; based on your health and abilities
- Older adults: Follow adult guidelines, adapted as needed based on your health

## What are Some Examples of Muscle-strengthening Exercises?

Muscle-strengthening exercises can be done:

- With weight machines
- With hand and ankle weights
- With elastic exercise bands
- By moving against gravity

## How Much Muscle-strengthening Exercise Should You Do?

The recommendations for strengthening exercises are:

- 2-3 days per week; 1-3 sets of 8-12 exercises, including all major muscle groups
- Hard enough to cause fatigue by 8-10 repetitions (or 15-20 repetitions of a lighter weight if you are frail or are at risk of a fracture)

**Muscle-strengthening exercises should always be done with proper form**

# POSTURE AND BONE HEALTH

## Posture and Body Mechanics

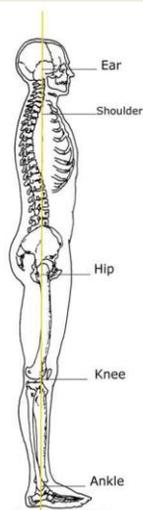
- Good posture and proper body mechanics are important to decrease your risk of spine fractures

## Spine Fractures May Cause:

- Pain
- Loss of height
- Stooped posture
- Difficulty breathing
- Stomach pains or digestive discomfort
- Loss of self-esteem



## How is Your Posture?



Good Posture



Forward Head

<http://www.teamsportstraining.com/>

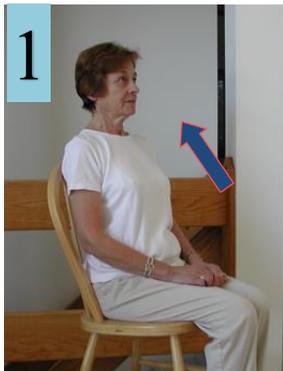
<http://www.trainawaythepain.com/postures.jpg>

## Posture and Body Mechanics

- You may need to see a physical therapist to examine your posture and body mechanics; he/she can prescribe specific exercises for you
- Posture exercises can be done for a few minutes several times during the day

## Great Exercises

- *Lengthen the neck: Tilt breastbone up, lift head up and back, hold for 5-10 seconds, do 2-4 repetitions*
- *This can be done sitting, lying down, standing, or on your car headrest during stop lights!*



## Great Exercises

- *Pectoral Stretch: Stand facing corner or in a doorway, step into a lunge, forearms/hands on wall, elbows below shoulder level, slowly lean to get a stretch on the front of your shoulders, hold for 30 seconds, do 1-2 repetitions*



## Great Exercises

- *Abdominal isometric strengthening: Lie in a comfortable position, head on the floor/bed/pillow*
- *Pull your navel in, lift one knee toward chest as the hand pushes it away, hold 2 seconds, relax but keep your knee up then repeat 5-10 times each side and 5-10 crossing hand to opposite knee*



# FALLS AND FRACTURES

## Falls and Fractures

- More than 1/3 adults, age  $\geq$  65 yrs, fall each year
- Fall-related injuries are the leading cause injury deaths and disabilities in older adults
- Most fractures in older adults result from a fall
- Most serious injury is hip fracture
  - 90% of hip fractures are the direct result of a fall

(CDC Recommendations and Reports, 2000)

## Hip Fractures have Serious Consequences

- Usually requires surgery
- 1 in 5 need a skilled nursing facility within a year
- 1 in 4 become disabled
- Many become isolated and depressed
- 1 in 5 die within a year of the fracture



## Risk Factors for Falls

- Increasing age
- Muscle weakness
- Functional limitations
- Environmental hazards
- Use of psychoactive medications
- History of falls

## Balance and Falls

- A complete balance assessment may include a review of your medications, a vision exam, a safety check of your home, and tests of your strength, flexibility, posture and balance

## How Good is Your Balance?

### One-leg Stance Test

- Stand on dominant foot, arms folded across chest, barefoot, eyes open
- How long can you stay without:
  - Stepping with your standing foot?
  - Touching the raised foot to the ground?
  - Using the lifted leg to support the weight bearing limb?
  - Moving your arms out of position?

# Let's do it!



**Correct Form**



**Incorrect Form**

## One-leg Stance Norms

Age	Eyes	Time in Seconds
20-29	Opened	30.0
	Closed	28.8 (2.3)
30-39	Opened	30.0
	Closed	27.8 (5.0)
40-49	Opened	29.7 (1.3)
	Closed	24.2 (8.4)
50-59	Opened	29.4 (2.9)
	Closed	21.0 (9.5)
60-69	Opened	22.5 (8.6)
	Closed	10.2 (8.6)
70-79	Opened	14.2 (9.3)
	Closed	4.3 (3.0)

## How is Your Dynamic Balance?

### Tandem Walk Test

- Try to walk heel-to-toe along a 2 inch wide line/floor board
- Your heel and toe should touch or almost touch
- Count the steps you manage before you:
  - Touch a foot to the floor before proper placement
  - Don't touch heel to toe
  - Miss the line
  - Reach 20 steps (Yeah!)
- Should be able to complete 20 steps within 3 trials



**BALANCE TO PREVENT FALLS**

## Balance Exercises

- Balance can be improved with exercises for leg strengthening and stretching, challenging balance exercises, and with tai chi
- Balance exercises can be done for a few minutes each day
- Balance exercises are very important for older adults and all who have balance problems



## Balance Exercises

Positions for feet:

Wide stance



Normal stance



Narrow stance



Wide semi-tandem



Semi-tandem



Tight semi-tandem



Full tandem



Single limb, other foot in the air



## Balance Exercises

- *For safety, stand with back to a corner or near a sink (hands hovering in)*
- *Stand heel to toe*
- *Stand on one leg*
  - *Then do it on a pillow*
  - *Or with your eyes closed*
- *Walk heel to toe down the hall*
- *Do crossovers*
- ***You should feel wobbly but not as if you could lose your balance or fall***
- *Do leg strengthening exercises*



## SAFETY IN EXERCISE AND MOVEMENTS

Pilates and Osteoporosis  
Liverpool Library  
Monday, June 19 at 6-7 p.m.

## Safe Movement

- Some movements and exercises may be unsafe if you have low bone density or osteoporosis
- You should avoid:
  - spine flexion
  - full spine rotation
  - strenuous overhead lifts
  - activities that increase risk of a fall

## Safe Movement

- Some examples of spine flexion are:
  - Curl sit-ups
  - Toe touches and bending to the floor

**AVOID!**



## Safe Movement

- An example of full spine rotation is:
  - The **extreme** twist at the beginning and end of a golf swing if you have had fractures or are frail
    - Work with a professional to determine what is right for you

**AVOID!**



## Safe Movement

- Some examples of strenuous overhead lifting are:
  - When lifting **heavy** weights
  - When lifting something heavy into a top cupboard/overhead in a plane
  - When lifting babies/children overhead
    - Work with a professional to determine what is right for you



## Safe Movement

- Some examples of activities that increase risk of a fall are:
  - Downhill skiing
  - Walking on ice
  - Walking on wet floors
  - Rollerblading



**PUTTING IT ALL TOGETHER**

## The Exercise Prescription

- Weight-bearing exercises can be done for 30 minutes, most days of the week; focus on impact
- Muscle-strengthening exercises should be done 2-3 times per week, proper form
- Balance exercises and posture exercises can be done for a few minutes each day
- You may choose to do exercises that are most important to you

## Working with a Healthcare Professional

- Consider working with your healthcare professional if:
  - You are not sure of the exercise program that is best for you
  - You have had a fracture
  - You have fallen recently
  - You have pain that prevents exercise