Safe & Effective Exercises for Osteoporosis

Karen Kemmis, PT, DPT, MS, GCS, CDE, FAADE
SUNY Upstate Medical University
Physical Medicine & Rehabilitation
Joslin Diabetes Center and University Endocrinologists
315-464-6543

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 ≥50 yrs

- 1 out of 4 White men aged ≥ 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
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?

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 prescribed 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 ≥ 65 yrs, fall each year
- Fall-related injuries are the leading cause of 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

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<th>Age</th>
<th>Eyes</th>
<th>Time in Seconds</th>
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<td>Opened</td>
<td>30.0</td>
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<td></td>
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<td></td>
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<td>50-59</td>
<td>Opened</td>
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<tr>
<td></td>
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<td>70-79</td>
<td>Opened</td>
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<td></td>
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<td>4.3 (3.0)</td>
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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:

<table>
<thead>
<tr>
<th>Wide stance</th>
<th>Normal stance</th>
<th>Narrow stance</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Wide stance" /></td>
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<td><img src="image" alt="Narrow stance" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wide semi-tandem</th>
<th>Semi-tandem</th>
<th>Tight semi-tandem</th>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Wide semi-tandem" /></td>
<td><img src="image" alt="Semi-tandem" /></td>
<td><img src="image" alt="Tight semi-tandem" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Full tandem</th>
<th>Single limb, other foot in the air</th>
</tr>
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<td><img src="image" alt="Full tandem" /></td>
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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