



**Comprehensive
Physical Therapy
Center**

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Osteoporosis

What is it?
What can you do about it?
How can physical therapy help you?



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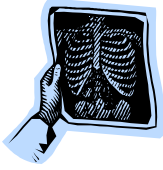
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Osteoporosis

Osteoporosis is a condition that causes deterioration of your bones. Bones provide support for your body and must be strong enough to withstand everything from minor injuries to traumatic falls. The strength in bones comes from their mass, which is determined by both factors you inherit and lifestyle factors. Bone mass begins accumulating at a very young age through the build up of calcium and minerals in the bones, which are bonded together in a honey-comb-like structure. After age 35, calcium in bones is lost faster than it is replaced, resulting in weakening of the bony structure. In an individual with osteoporosis the bones become very brittle as a result of these decreases in bone mass.

An early sign of osteoporosis is osteopenia, which is diagnosed as a peak bone mass lower than normal, but not low enough to be considered osteoporosis. So how do you know if you are at risk for developing osteoporosis? Monitoring modifiable and non-modifiable risk factors for low bone mass will help you determine your risk.

Non-modifiable risk factors:

1. Gender – females are at greater risk.
2. Age – As you get older, your bones become less dense and weaker.
3. Body size- Small & thin-boned individuals are at greater risk.
4. Ethnicity – Caucasians & Asians have a greater risk than African-Americans & Hispanics.
5. Family history of osteoporosis or fractures.
6. Having your first menstrual period at a late age & reaching menopause prior to age 45 (naturally or surgically) both increase the risk of low bone density. Low testosterone levels in males.
7. Disease states
 - a. Hyperthyroidism
 - b. Hyperparathyroidism
 - c. Hyperadrenocorticism
 - d. Type I diabetes (insulin dependent)
8. Medicine Use
 - a. Cortisone and glucocorticosteroids may reduce bone strength
 - b. High doses of thyroid medication
 - c. Anticonvulsants & Heparin can reduce bone strength, although it is relatively uncommon.



(Talk to your physician if you have concerns).

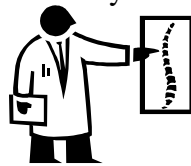
Modifiable risk factors:

1. Low calcium intake throughout life.
2. Vitamin D deficiency.

3. Low intake of phosphorus.
4. Inactivity and lack of regular exercise.
5. Chronic alcohol consumption (more than 1 drink per day for women and more than 2 for men).
6. Cigarette smoking.
7. Low sex hormone levels (estrogen in women, testosterone in men).
8. Anorexia.



Diagnostic testing can be done to measure how strong bones are. The test uses dual-energy x-ray absorptiometry (DEXA) to quickly, accurately, and painlessly determine bone mineral density.



Nutrition



Calcium provides strength to the bones.

Sources of Calcium

- yogurt
- milk
- cheese
- dark green, leafy vegetables



Calcium supplements can be beneficial to reduce bone mineral loss associated with aging, although these supplements do not reverse low bone density or fracture risk in individuals with osteoporosis.

Common calcium supplements

- calcium carbonate
- calcium phosphate
- calcium citrate
- calcium lactate
- calcium gluconate

Vitamin D helps maintain blood calcium levels and promotes mineral deposit in the skeleton.

Sources of Vitamin D

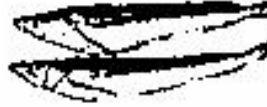
- eggs



- ready-to-eat cereals
- cod liver oil
- mackerel

How Much Daily Vitamin D do I Need?

Age	Daily Intake (micrograms/day)
19- 30 years	5
31-50 years	5
51-70 years	10
> 70 years	15



Vitamin D Content of Foods

Food	Serving Size	Vitamin D (mg)
Milk (fortified with vitamin D)	8 fl. Ounces	2.5
Instant Breakfast	1.25 ounce packet	2.5
Margarine	1 Tablespoon	1.5
Puddings	½ cup	1.3
Cod Liver Oil	1 Tablespoon	0.9
Cheesecake	1/8 slice of 9-inch cake	0.7
Egg, whole	1 large	0.6
Egg, yolk	1 large	0.6
Cereal, ready to eat	½ cup	0.6-2.5
Corn Flakes TM	½ cup	0.6
Nut & Honey TM	½ cup	0.9
Fruit & Fiber TM	½ cup	1.2
Special K TM	½ cup	1.3
Grape Nuts TM	½ cup	2.5
Beef Frankfurter	1	0.3
Bologna	1 slice	0.2
Salami	1 slice	0.2

How Much Calcium Do I Need Each Day?



How much calcium you need depends upon your gender, age, and if you are taking medications such as estrogen or glucocorticosteroids. Use the table below to find your daily calcium needs.

Age	Milligrams (mg) of calcium needed
Women	
25-50 years old	1,000 mg
51-65 years old and postmenopausal	
-taking estrogen	1,000 mg
- not taking estrogen	1,500 mg
Over 65 years old	1,500 mg
Pregnant and nursing	1,200-1,500 mg
If using glucocorticosteroids regardless of age	1,500 mg
Men	
25-65 years old	1,000 mg
Over 65 years old	1,500 mg
If using glucocorticosteroids regardless of age	1,500 mg
Adolescents/Young Adults	
11-24 years old	1,200-1,500 mg
Infant/ Children	
Newborn to 6 months	400 mg
6 months to 1 year	600 mg
1-5 years old	800 mg
6-10 years old	800-1,200 mg

Source: Recommendations for Optimal Calcium Intake (National Institutes of Health Consensus Development Panel on Optimal Calcium Intake, 1994) Arthritis Foundation 1999.
Osteoporosis and You! – Module 3 <http://www.arthritis.org> 1-800-263-7800



Calcium Content of Food

Food	Serving Size	Calcium (mg)
Yogurt, calcium-fortified, non-fat	1 cup	452
Swiss cheese	1 ounce	408
Ricotta cheese, part skim	½ cup	337
Yogurt, flavored, low-fat	1 cup	314
Cheddar cheese	1 ounce	306
Milk, skim	1 cup	302
Calcium fortified orange juice	1 cup	300
White bread, calcium fortified	1 slice	300
Milk, 2%	1 cup	297
Milk, whole	1 cup	291
Dried figs	5	258
Soy nuts	½ cup	252
Calcium-fortified cereal	1 cup	250
Fortified soy milk	1 cup	250
Sardines, with bones	2 ounces	217
Blackstrap molasses	1 tablespoon	187
Collard greens, cooked	½ cup	178
Sesame seeds	2 tablespoons	176
Soybeans, cooked	1 cup	175
Instant pudding	½ cup	150
Cottage cheese, low fat	1 cup	145
Sardines without bone	2 ounces	135
Tofu	½ cup	130 (up to 300 for firm)
Navy beans, cooked	1 cup	128
Vegetarian baked beans, cooked	1 cup	128
Tahini	2 tablespoons	128
Great northern beans, cooked	1 cup	121
Ice cream, soft serve	½ cup	118
Non-fat dry milk powder	2 tablespoons	110
Turnip greens, cooked	½ cup	99
Almonds	¼ cup	94
Kale, frozen, cooked	½ cup	90
Parmesan cheese, grated	1 tablespoon	69
Okra, cooked	½ cup	50
Broccoli, cooked	½ cup	36
Whole wheat bread	1 slice	20

Source: Bowes and Church's Food Values of Portions Commonly Used, J. Pennington (Ed), JB Lippincott Co, 1994.
 Arthritis Foundation. 1999. *Osteoporosis and You*-Module 3
<http://www.arthritis.org> 1-800-283-7800

How to calculate Calcium and Vitamin D from food labels

Step 1: Look at the product label and find the amount of calcium per serving size. In the example, the amount of calcium per serving is 30%.

Step 2: Add a zero to the calcium percentage in order to give you the amount of calcium in milligrams. 300 milligrams for the example.

Step 3: Determine the amount of vitamin D in the product by examining the label. 25% in the example.

Step 4: Add a decimal between the percentage for the vitamin D to give you the amount in micrograms. 2.5 micrograms for the example.

SKIM MILK		Vitamin A & D	
Nutrition Facts			
Serving Size 8 fl oz (240mL)			
Servings per container 8			
Amount per serving			
Calories	80	Calories from Fat	0
% Daily value			
Total Fat	0g		0%
Saturated Fat	0g		0%
Cholesterol	less than 5mg		1%
Sodium	120mg		5%
Total Carbohydrates	12g		4%
Dietary Fiber	0g		0%
Sugars	11g		
Protein	8g		
Vitamin A	10%	Vitamin C	4%
Calcium	30%	Vitamin D	25%
Percentage daily values based on a 2,000 calorie diet. Your daily values may vary depending on your caloric needs.			

Step 1



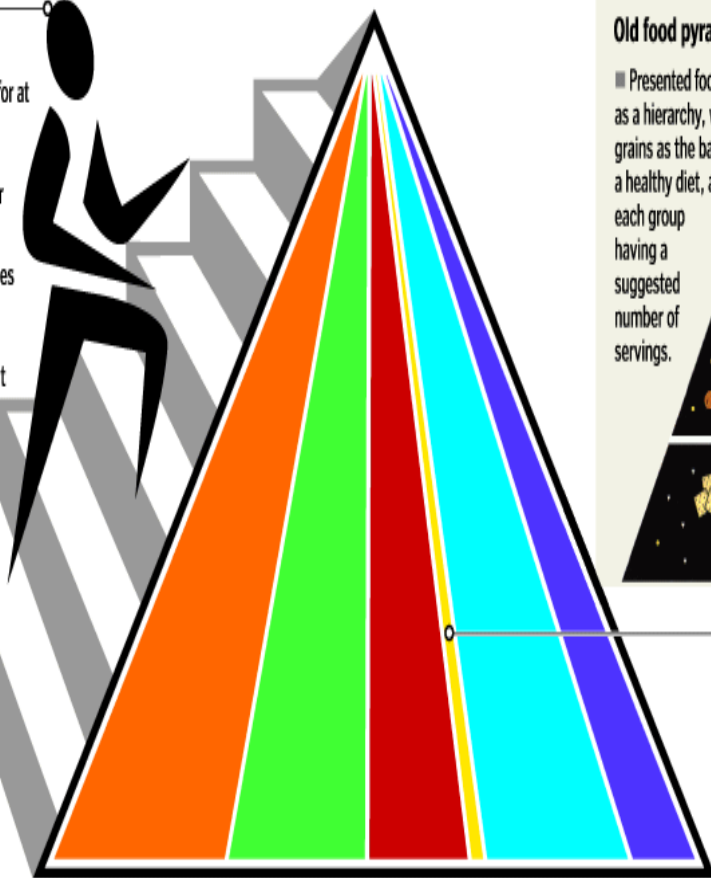
Step 3



Food Guide Pyramid

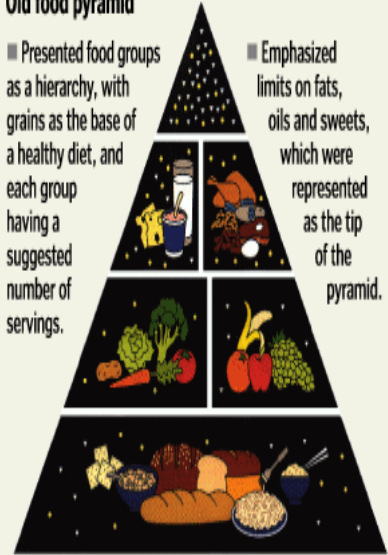
Exercise

- Adults should be physically active for at least 30 minutes most days of the week, children for 60 minutes.
- Sixty to 90 minutes of daily physical activity may be needed to prevent weight gain or sustain weight loss.



Old food pyramid

- Presented food groups as a hierarchy, with grains as the base of a healthy diet, and each group having a suggested number of servings.
- Emphasized limits on fats, oils and sweets, which were represented as the tip of the pyramid.



Oils

- Most fat should be from fish, nuts and vegetable oils.
- Limit solid fats, such as butter, margarine or lard.
- Keep consumption of saturated fats, trans fats and sodium low.
- Choose foods low in added sugar.

CATEGORY	Grains	Vegetables	Fruits	Milk	Meat and beans
RECOMMENDATION	Half of all grains consumed should be whole grains.	Vary the types of vegetables you eat.	Eat a variety of fruits. Go easy on juices.	Eat low-fat or fat-free dairy products.	Eat lean cuts, seafood and beans. Avoid frying.
DAILY AMOUNT	6 oz.	2.5 cups	2 cups	3 cups	5.5 oz.

Based on a 2,000 calorie diet.

Recommended nutrient intakes at 12-calorie levels can be found on mypyramid.gov.

Fact

Osteoporosis is called the silent disease because you cannot feel your bones becoming weaker.

What about...

Management techniques for osteoporosis-related pain

(neither cold or heat should be applied for greater than 20 minutes)

- cold packs
- hot packs
- acupuncture
- biofeedback
- behavior modification
- transcutaneous electric nerve stimulation (TENS)



Medication

In addition to exercise and proper nutrition physicians may prescribe medication for treatment or prevention of osteoporosis. There are benefits, risks, and contra-indications to each treatment that should be discussed with your physician and pharmacist.

Medications may include...

- Estrogen replacement therapy (Premarin, Estratab, Menest)
- Selective estrogen receptor modulators (Raloxifene)
- Calcitonin (Miacalcin)
- Bisphosphonates (Fosamax)



Sexual activity

Although sexual activity may be a sensitive issue for those with osteoporosis, it is important to know that sexual activity can continue. Try to avoid positions that cause twisting or forward bending of the spine. The full body weight of the partner should not be placed on the individual with osteoporosis. Spinal alignment can be maintained using pillows under the knees. Experiment with different positions until you find one that is comfortable for both of you and establish regular communication with your partner to maintain a satisfying sexual relationship.

Fall Prevention

To promote safety and reduce the risk of fracture due to a fall

In the home

- Make sure hallways, stairs, and rooms are well lighted.
- Use nightlights in hallways, bathrooms, and bedrooms.
- Keep a flashlight by the bed for use when you get up at night.
- Remove clutter from the floor.
- Do not use throw rugs.
- Use nonskid wax on floors.
- Make sure carpet edges are firmly secured.



- Install and use sturdy handrails for the stairs.
- Place frequently used items on easy to reach surfaces.
- Never use a chair as a step stool.
- Sit down to reach items on the floor or in low drawers.
- Sit down to put on shoes, socks, and pants.
- Store medications in their original container and take them as prescribed. (If you are on four or more prescription medications, you are at an increased risk of falling).

In the bathroom

- Use a rubber mat or a slip resistant pad in the bathtub to prevent falling.
- Consider using a shower seat.
- Install handrails beside the bathtub and toilet and in the shower if you are unsteady.

Reminders

- Limit alcohol intake.
- Do not rush through activities.
- Ask for assistance with overhead tasks and lifting, carrying, or moving heavy objects.

Please continue reading to discover additional ways to modify your lifestyle to reduce your risk of falling.

Osteoporosis & Exercise

Benefits of exercise

- increase growth of new bone
- build healthy bones, muscles, and cartilage
- improve bone mineral content
- strengthen muscles
- improve muscle tone
- reduce incidence of sprains, muscle strains, and fractures
- help maintain weight
- improve general endurance and flexibility
- help prevent falls
- improve balance and coordination





Beginning an exercise program

- Check with your physician before you start.
- Increase in activity may cause some temporary discomfort. Stop exercising if you experience severe, sudden bone pain. If you have pain that lasts two or more hours after exercising, you have probably done too much.
- Use an exercise program that has both weightbearing and resistive strengthening activities.
- Set goals for yourself and keep track of your progress.
- Make sure to replenish fluid in your body lost through sweat by drinking lots of water following physical activity.

How to Get Started

If you exercise, chances are you will reduce stress, increase your mental sharpness and improve your balance. Although it can be difficult to start a new habit, developing an exercise schedule is not as hard as it seems.

Check with your doctor

Always check with your doctor before beginning an exercise program, especially if you have any health problems or physical limitations.

Decide which exercises work for you

You may choose from exercises included in this booklet or try other activities such as walking and aerobic dancing that can be fun and relaxing. Try different exercises until you find some that you enjoy.

Deal with potential problems

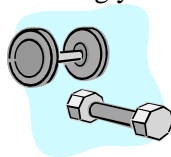
Think about why it's difficult for you to exercise and try to find a solution to these barriers. Developing a back-up plan will keep you on the right track.

- Incorporate exercise into your daily routine. Take the stairs, walk to the store, or park farther away from the entrance to work.
- Exercise at different times of the day. You may find you have more energy in the morning or afternoon. Do what works for you.
- If you are afraid of falling while exercising, hold on to a countertop or do seated exercises.
- Variety will help keep you interested in exercising. Try listening to music, exercising with others, and periodically incorporating new exercises to make the time go faster and keep you motivated.

Set goals

Write down what you want to accomplish. Make sure your goals are realistic, but challenging. Post your goals somewhere you will see them everyday. Remember to write down how you will reward yourself for meeting your goals.

Track your progress



Exercises You Can Do Anywhere

Category 1: Sitting or Standing Exercises for the Upper Body and Trunk

Position: Sitting or standing erect with arms relaxed at sides or in lap.

NECK EXERCISES

1. CHIN TUCKS (axial extension)

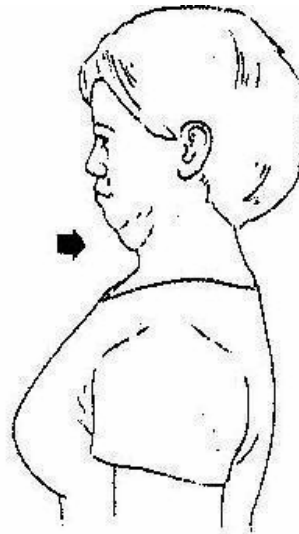
- Look straight ahead.
- Glide neck back to make a double chin.
- Hold six seconds.
- Relax.

This exercise can improve

- Posture
- Range of Motion

This exercise may cause

- Dizziness
- Neck Pain



Fact

Women suffer more fractures due to osteoporosis in a year than they do heart attacks, strokes, and cases of breast cancer combined.

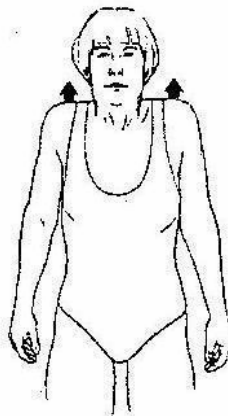
SHOULDER GIRDLE EXERCISES

2. SHOULDER SHRUGS (elevation)

- Stand erect, facing forward.
- Raise one or both shoulders up toward ears.
- Hold six seconds.
- Relax completely.

This exercise can increase

- Range of Motion



- Strength
- Relaxation

3. SHOULDER BLADE PINCH (retraction)

- Pull shoulder blades back and toward each other.
- Hold six seconds.
- Relax.

This exercise can improve

- Range of Motion
- Strength
- Posture



4. SHOULDER CIRCLES (scapular range of motion)

- Move shoulders slowly in a circular motion (forward, up, back, and around).

This exercise can improve

- Range of Motion
- Posture



ARM EXERCISES

5. FORWARD ARM REACH (shoulder flexion)

Version A

- Position arms out in front, palms facing one another.
- Raise one or both arms forward and up as high as possible (one arm may help the other, if needed).
- Lower slowly.

Version B

- Repeat Version A.
- Continue motion by bringing arms behind the body.

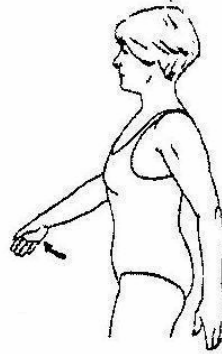
Version C

- Alternate one arm forward and one behind.



This exercise can increase

- Range of Motion
- Strength
- Relaxation



Do NOT do this or any other arm exercises in this booklet if you have had joint surgery – specifically arthroplasty or shoulder replacement surgery.



Fact

Having your vision checked yearly reduces your risk for falling.

6. SIDEWAYS ARM REACH (abduction)

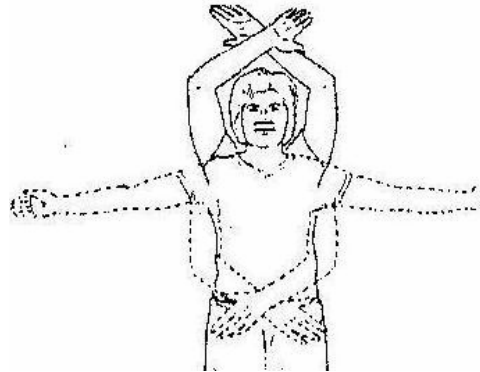
Version A

- With palms up and elbows straight, raise arms out to the side and up, as if clapping above your head.
- Lower slowly.



Version B

- Do Version A, then gracefully cross arms above head.
- Bring arms down and gracefully cross arms in front of your body.



This exercise can improve

- Range of Motion
- Strength
- Relaxation
- Ability to dress and reach

7. SCARECROW (horizontal abduction and adduction)

- Straighten elbows, arms at shoulder level in front.
- Spread arms out to the side like a scarecrow.

This exercise can improve

- Range of Motion

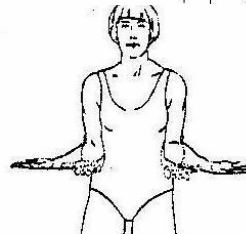
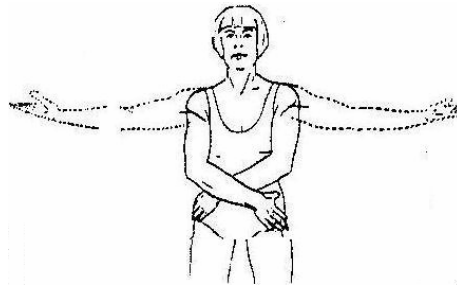


8. SCISSORS (combined shoulder abductor/adductor horizontal and diagonal movement)

- Cross arms at hips.
- Uncross as you move arms out to the side.
- Cross again six inches higher.
- Repeat movements two to three times as you go higher.

This exercise can improve

- Range of Motion
- Strength
- Ability to iron, vacuum, and dress



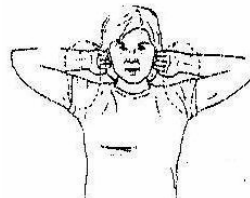
9. SHOULDER ROTATION (external rotation)

Version A

- Bend elbows and position forearms parallel to the floor.
- Rotate arms in to touch stomach.
- Rotate arms out away from body.

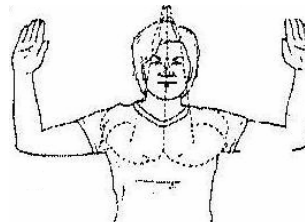
Version B

- Place fingertips behind ears.
- Move elbows apart.
- Reach elbows together.



Version C

- Place arms out to the side, elbows bent.
- Bring forearms together.
- Return out to the side.

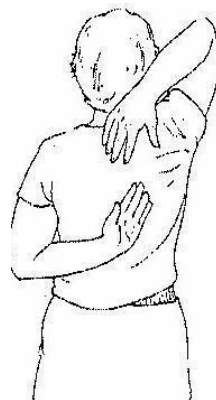


This exercise can improve

- Range of Motion
- Strength
- Ability to tuck in shirt and put belt

10. BACK PAT and RUB (combined shoulder internal/external rotation)

- Reach one arm up to pat back.



on

- Reach the other arm behind lower back.
- Slide hands toward each other.
- Hold 20 seconds.
- Alternate arm position and repeat.

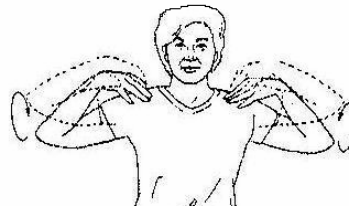
This exercise can improve

- Range of Motion
- Ability to dress

11. ARM CIRCLES (abduction with circling)

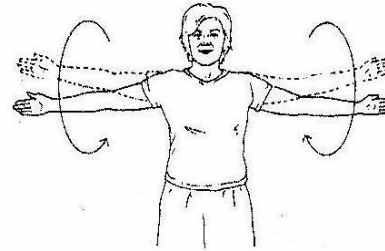
Version A

- Rest hands on shoulders, elbows pointed out.
- Make circles with elbows.
- Vary size and direction of circles.



Version B

- Position arms out at shoulder level.
- Make circles.
- Vary size and direction of circles.



This exercise can improve

- Range of Motion
- Posture
- Ability to dress and reach

Fact

Falls are the leading cause of injury in the elderly.

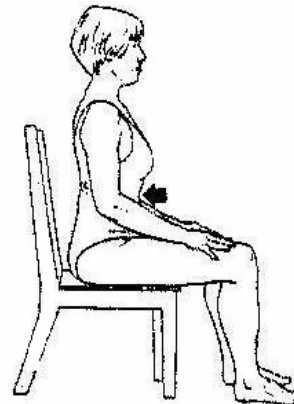
Category 2: Sitting Exercises for the Lower Body

12. SITTING PELVIC TILT (lower abdominals)

- Sitting in a chair, tighten stomach muscles to tilt the pelvis back (the arch in your lower back should flatten).
- Hold 6 seconds.
- Relax.

This exercise can improve

- Posture
- Strength

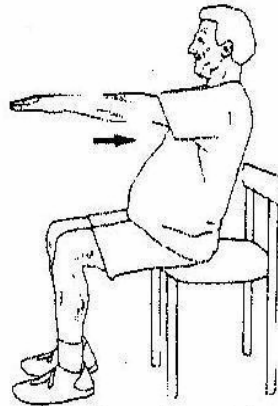


13. ROCKING CHAIR (abdominal strengthener)

- Sit at edge of chair, arms straight out in front.
- Contract your abdominal muscles.
- Keeping your back straight, lean back using your abdominal muscles to hold you up.
- Return to start position and relax. (Remember to keep breathing for the duration of the exercise).

This exercise can improve

- Strength

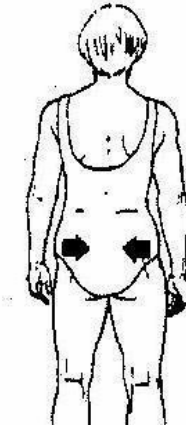


14. BUTTOCKS SQUEEZE (gluteal set)

- Sit on a chair or stand.
- Squeeze buttocks together.
- Hold 6 seconds.
- Relax.

This exercise can improve

- Strength
- Ability to slide up in bed and stand up

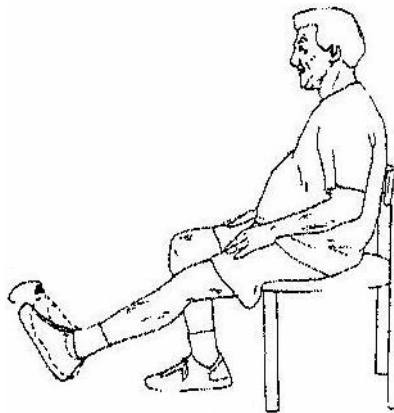


15. ANKLE CIRCLES (inversion/eversion/circumduction)

- Sit up straight one foot extended in front.
- Turn sole of foot in and out.
- Then move foot in a slow, large circle.
- Change the direction of the circle.

This exercise can improve

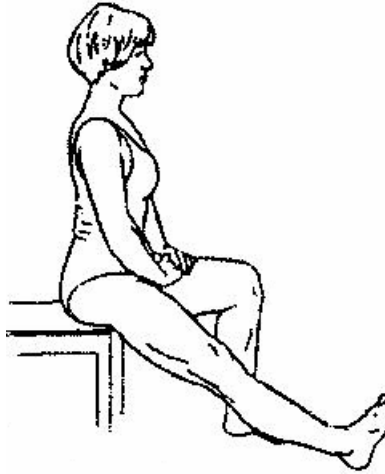
- Range of motion
- Circulation
- Balance
- Ability to walk and climb stairs



This exercise may cause muscle cramps.

16. HAMSTRING and ANKLE STRETCH

- (knee and ankle mobility)
- Sit with one leg extended in front and heel on floor.
 - Pull foot back, pointing toes toward the ceiling.
 - Lean forward from the hips until you feel a stretch in the back of the thigh, knee, and/or calf.
 - Hold 20-30 seconds.
 - Repeat with the other leg.



This exercise can improve

- Range of motion
- Posture

Fact

1 out of 4 men over age 50 is at risk for having an osteoporotic fracture.

Category 3: Standing Exercises

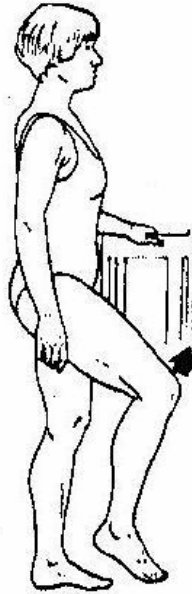
Do not do this category of exercises if you have problems with your balance. Ask your physician or physical therapist before trying these exercises if you have had a hip, knee, and/or ankle replacement or surgery.

17. MARCH (hip/knee flexion)

- Stand holding on to a firm surface.
- Alternate lifting knees up and down as if marching in place.

This exercise can improve

- Range of motion
- Strength
- Endurance
- Ability to walk and climb stairs



18. MINI SQUAT (quadriceps and gluteals strengthener)

- Stand holding on to a chair or with back flat against the wall and feet out in front of knees.
- Squeeze the buttocks and hold.
- Slowly bend knees and lower body a few inches.
- Keep feet flat and do not allow your knees to cross over your toes.
- Hold 3 seconds.
- Slowly straighten knees.

This exercise can improve

- Strength
- Posture
- Ability to get up from a chair and walk



This exercise can improve

- Posture
- Range of Motion
- Strength

19. SIDE LEG RAISE (hip abduction)

- Stand straight, holding on to a firm surface with feet shoulder width apart.
- Keeping your back and legs straight with your toes forward, slowly lift one leg 6-12 inches out to the side.
- Hold position for 3 seconds.
- Slowly return leg to start position and repeat.
- Repeat with opposite leg.

This exercise can improve

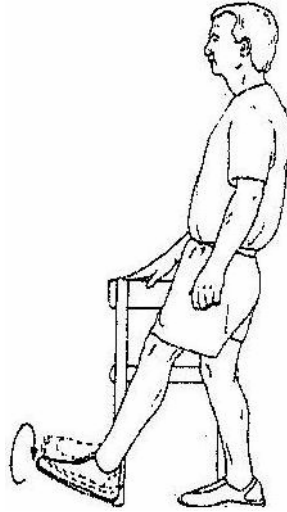
- Strength
- Ability to walk



Fact

20. ST Approximately 40% of women over age 50 will experience an osteoporotic fracture in their lifetimes.

- Stand straight, holding on to a firm surface with feet shoulder width apart.
- Keeping your back straight and slowly bend one knee up behind you.
- Hold position for 3 seconds.
- Slowly return leg to start position and repeat.
- Repeat with opposite leg.



This exercise can improve

- Strength
- Ability to go up/down stairs

21. TIP TOE (heel raises for ankle/plantar flexion)

- Stand straight, holding on to a firm surface with feet shoulder width apart.
- Rise up on your toes by lifting heels up.
- Hold 3 seconds.
- Slowly return leg to flat feet.
- Repeat with opposite leg.



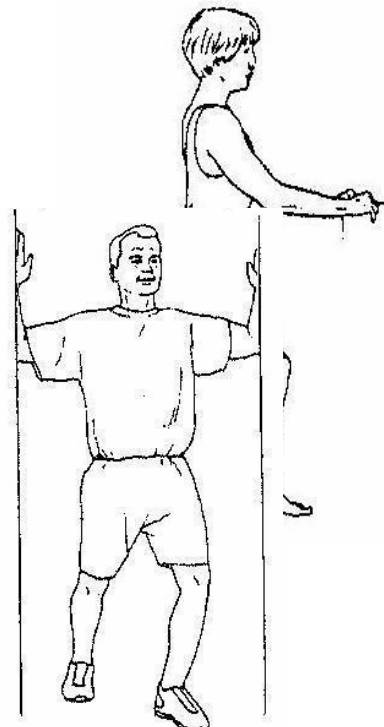
This exercise can improve

- Strength
- Balance
- Range of motion
- Ability to walk and go up/down stairs

This exercise may cause muscle cramps.

22. CALF STRETCH (gastroc-soleus stretch)

- Stand straight, holding on to a firm surface.
- Put one leg behind you, keeping heel on floor.
- Bend the front knee until you feel a stretch in the back of your calf.
- Hold 30 seconds.
- Repeat with opposite leg.



This exercise can improve

- Range of motion
- Ability to walk

23. CORNER STRETCH (pectoralis stretch)

- Stand straight, with hands or forearms in corner or doorway.
- Step forward with one leg until you feel a stretch across your chest.
- Hold 30 seconds.

This exercise can improve

- Posture
- Range of motion

Fact

More than 1 million fractures per year in the United States can be attributed to osteoporosis.

Category 4: Floor Exercises

Ask your physician or physical therapist before trying these exercises if you have had a back, hip, knee, and/or ankle replacement or surgery.

24. BENT KNEE ROLL (hip adductor stretch)

- Lie on back with one knee bent and foot flat and the other leg resting on the floor.
- Allow the bent knee to roll slowly out to the side and toward the floor until you feel a stretch in the inner thigh.
- Hold 30 seconds.
- Repeat on other leg.

This exercise can improve

- Range of motion
- Ability to cross legs



25. UPPER LEG LIFT (hip abduction)

- Lie on side with bottom leg bent.
- Slowly lift top leg, keeping it straight and in alignment with the body.
- Lower slowly.
- Repeat lying on opposite side.

This exercise can improve

- Strength
- Range of motion



Fact

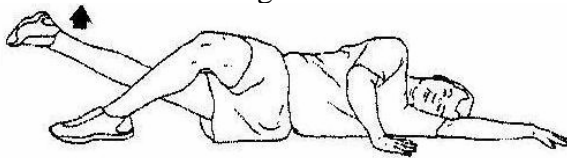
To promote bone strengthening, the intensity of the exercise must be increased over time.

26. LOWER LEG LIFT (hip adduction)

- Lie on side with top leg bent and foot flat in front or behind other knee.
- Lift bottom leg five to eight inches off floor.
- Lower slowly (do not roll hips or trunk).

This exercise can improve

- Range of motion
- Strength

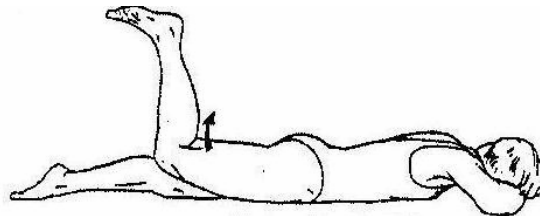


27. FACELYING LEG LIFT (hip extension)

- Lie face down with head in a comfortable position.
- Bend one knee and lift leg a few inches off the floor.
- Lower slowly (make sure movement is in hip and not lower back).
- Repeat with other leg.

This exercise can improve

- Strength
- Posture
- Range of motion



Fact

28. FAC 10 million people have osteoporosis and another 34 million are at risk of developing the condition.

Version A

- Squeeze shoulder blades together.
- Hold 6 seconds.

Version B



- Squeeze shoulder blades together.
- Lift arms one inch off the floor while maintaining the squeezed shoulder blades.
- Hold 6 seconds.



Version C

- Position arms 90° from the body with elbows bent 90°.
- Squeeze shoulder blades together as you lift your forearms three inches from the floor.
- Hold 6 seconds.



Version D

- Rest arms on floor above head.
- Squeeze shoulder blades together as you lift one arm three inches from the floor.
- Hold 6 seconds.
- Repeat with other arm.

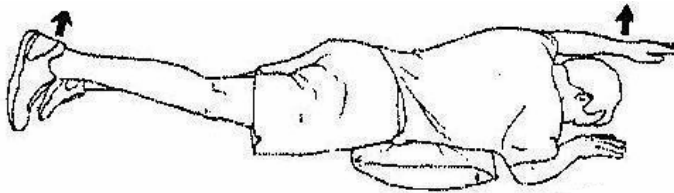


29. ARM-LEG REACH (trunk stabilization)

- Lie on stomach with neck in a comfortable position.
- Lift one arm.
- Keep arm up while lifting opposite leg.
- Hold 3 seconds.

This exercise can improve

- Posture
- Strength



30. DOUBLE HIP ROTATION (hip, thigh, and trunk stretch)

- Lie on back with knees bent and feet flat on the floor.
- Keep your shoulders on the floor.
- While keeping your knees bent and together, gently lower legs to one side until you feel a stretch.

- Hold 30 seconds.
- Return to starting position and repeat to opposite side.

This exercise can improve

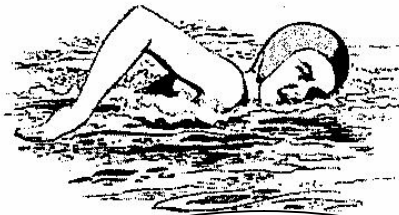
- Range of motion

Joint Stress during Activity

The chart below shows you which joints get the most stress in certain activities. Use this chart to help you choose activities that put the lowest stress through joints in which you have pain or arthritis.

Low stress x
 Moderate stress xx
 High stress xxx

Activities	Hips	Knees	Ankles	Shoulders	Hands
Walking	x	x	x		
Swimming				x	x
Running	xx	xxx	xxx		
Rowing	x	xx	x	xx	xx
Stairs	xxx	xxx	x		
Cycling	x	xx	x		x
Tennis	xxx	xxx	xxx	xxx	xxx
Aerobics	xx	xx	xx	x	



Fact

70-80% of hip fractures in the elderly can be attributed to osteoporosis.

Exercise

General Guidelines

1. Perform 10 repetitions of each resistance exercise. Progress to 3 sets of 10 repetitions as you get stronger.

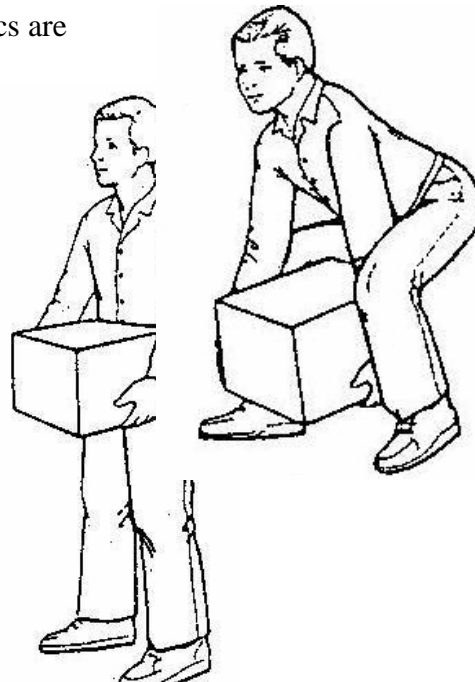
2. Rest between sets if you are using resistance (weights, theraband, tubing, etc.).
3. Gradually increase the amount of resistance you use.
4. Weightbearing exercises should be done 3-5 times per week, working up to 30-45 minute sessions. Weightbearing activities such as walking and jogging improve bone strength.
5. Resistance exercises should be done 2-3 times per week to strengthen muscle.
6. Postural activities should be included in your daily routine to reduce stress through the back and reduce the risk of spinal fracture.
7. Balance activities should also be done daily to help maintain equilibrium and reduce the risk of falling.
8. Remember not to hold your breath during exercising and to immediately stop exercising if you feel dizzy or short of breath.



Moving Safely

Good posture and proper body mechanics are important throughout life, particularly when you have osteoporosis. Knowing how to move, sit, and stand properly can help you resume your active life while avoiding fractures and disability. Proper posture can also help to limit the amount of kyphosis (forward curvature of the spine) that can result from vertebral fractures.

One of the most important concepts of body mechanics and posture is



alignment. Alignment refers to the relationship of the head, shoulders, spine, and hips to each other. Proper alignment of the body puts less stress on the spine and ensures good posture. Excessive twisting of the back, bending forward from the waist, and a slumped, head-forward posture put harmful stress on the spine.

Unsafe Movements

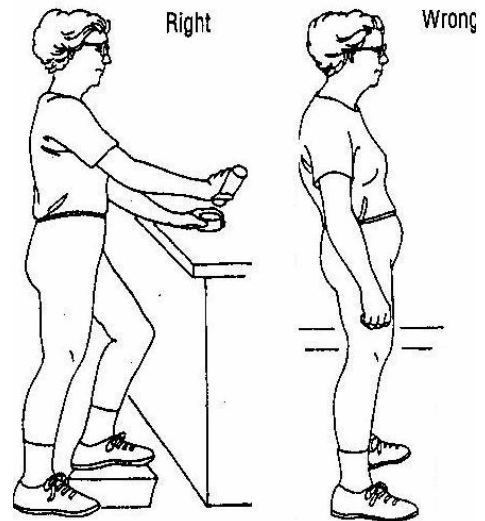
Avoid exercises that involve twisting the spine or bending over from the waist with straight legs (toe touches, side crunches). This is especially important for individuals with low bone density because bending forward puts stress on the spine and can lead to vertebral fractures. Also, avoid bending forward during activities, such as coughing, sneezing, vacuuming, lifting, or reaching up for items on high shelves.

1. Standing

Keep your head high, chin in, and shoulder blades pinched slightly together. Maintain the natural arch of your lower back as you flatten the stomach. The position of your legs and feet is important as well. Your foot should point straight ahead with the knee lined up over the point of your shoe (second toe). While standing in one place for longer than a few minutes, put one foot up on a stool or in an open cupboard. Switch to the other foot periodically. This should be much less tiring.

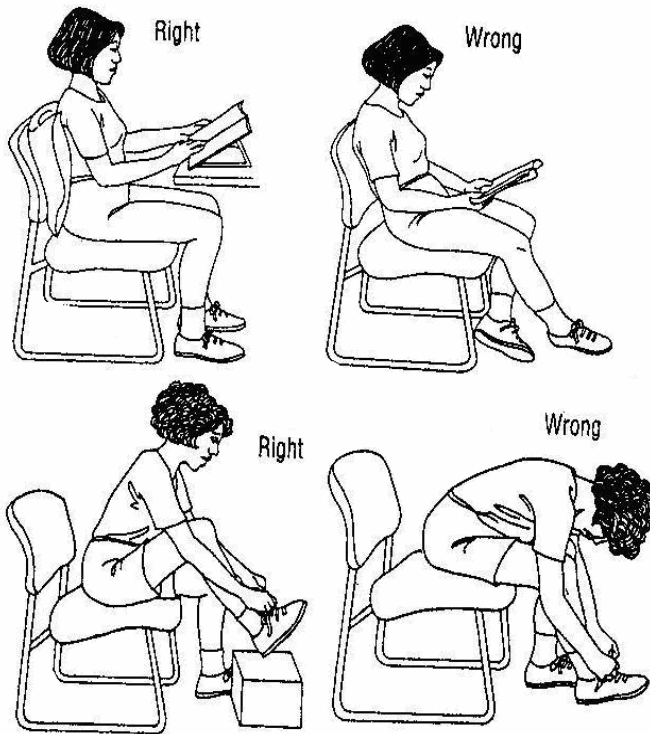
2. Walking

Walk with your chin in, head held high, and shoulder blades pinched. Your foot should point straight ahead, not out to one side. The knee should be lined up over the point of your shoe (second toe). You may need to consciously turn the knee to line up your foot properly. Do not let knee lock as you bring your weight over your foot; keep it slightly bent. Wear rubber or other non-slip soles when walking and land lightly on your heels.



3. Sitting

When sitting in bucket seats or soft couches or chairs, use a rolled towel or pillow support with sufficient thickness for comfort behind your lower back. When driving, use the neck rest-increasing the thickness of the cushion slightly, if necessary for support. When reading, tying your shoes, or drying your feet, do not bend over. Maintain the natural lower back curve and flat upper back. At a desk, prop up a clipboard so it slants towards you, like a drafting table. Use a foot-stool or footrest when seated for long periods of time.

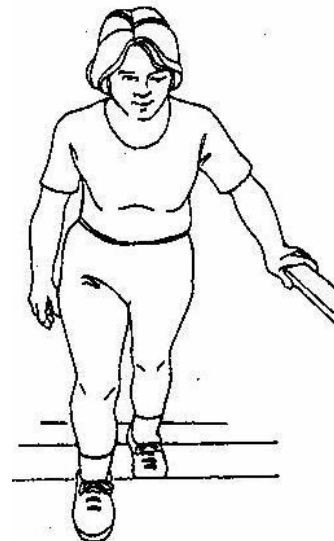


4. Stair Climbing

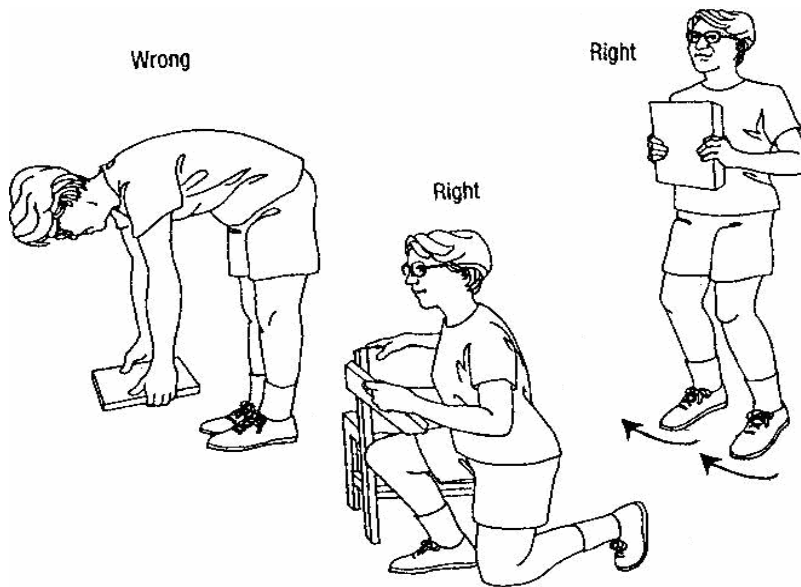
When going up or down stairs, maintain hip, knee and foot alignment (described under walking). Keep your feet at least six inches apart and hold onto the rail.

5. Bending and Lifting

Keep your feet flat and about shoulder width apart. Keep your arms close to your sides. Maintain the curve in your lower back, while pinching your shoulder blades together.



Bend at the knees, keeping your back straight. You should not bend far enough that your back is parallel with the ground. Pull the object close to you before you stand. Gently breathe in while you are lifting the object.



6. Pushing and Pulling

Instead of bending and twisting when you vacuum, rake, sweep, or mop, stand with your feet apart (one in front and one behind) and pointing forward. Shift your weight from foot to foot in a rocking motion. Remember to keep your knees bent slightly, shoulder blades pinched together, and back straight.

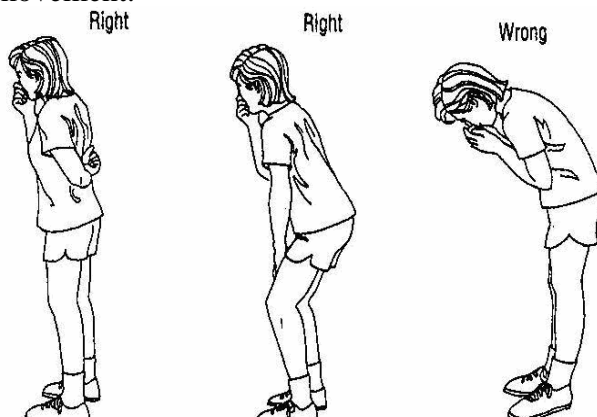


Fact

Most people lose 20-40% of their muscle tissue as they get older.

7. Coughing and Sneezing

Develop the habit of supporting your back with one hand whenever you cough or sneeze. Place your hand behind your back or on your knee. This protects the spine and intervertebral discs (cushions between the bones that serve as shock absorbers) from damage caused by sudden, forceful movement.



8. Getting into Bed

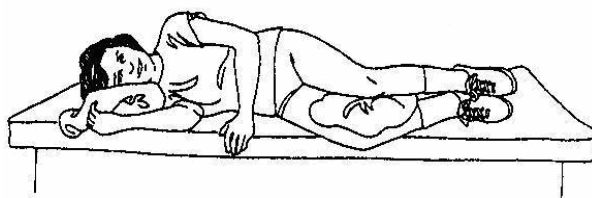
To get into bed with minimal strain and twisting, first sit down on the side of the bed. Then lie down on your side, bringing both feet up onto the bed at the same time. Keep your knees bent and arms in front of you, then roll onto your back in one motion.

9. Getting out of Bed

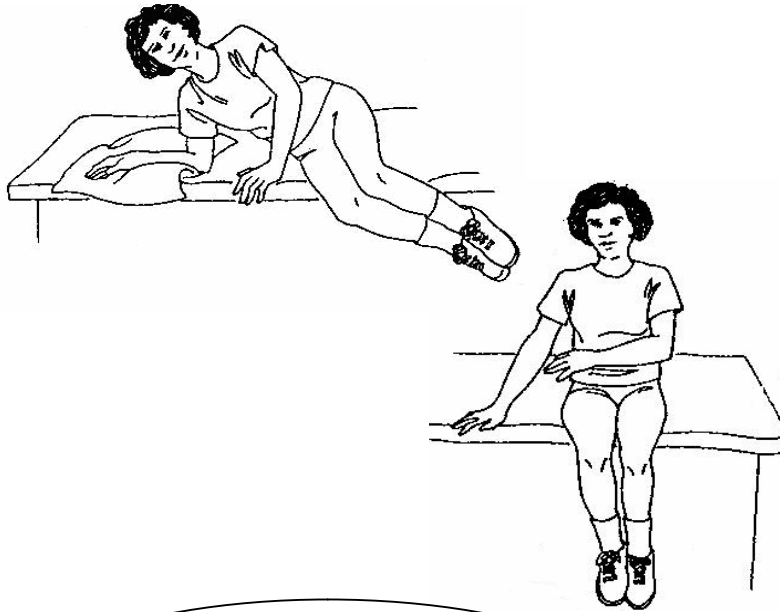
Reverse the steps you took to get into bed. Keep both arms in front of you. Use your hand to raise your upper body as you carefully move your legs over the side of the bed. Sit on the edge of the bed for a moment or two before you stand up.

10. In Bed

For most people, one pillow under the head is sufficient to keep the neck and back aligned. If you sleep on your side, use a pillow between your legs to



help with spinal alignment.



Fact

50% of elderly people who are able to walk without assistance (cane, walker) prior to a hip fracture are unable to do so after a fall.

How do

Physical therapy can help people with osteoporosis for a variety of reasons.

1. Evaluation of strength, flexibility, and balance.
2. Instruction in safe stretches, exercises, and body mechanics.
3. Balance training.
4. Education on proper posture and lifting techniques.
5. Development of a home exercise program and/or fitness center program tailored to you.
6. Management of pain through exercise and therapeutic modalities (examples include moist heat, cold packs, and manual techniques).
7. Selection and fitting of appropriate devices to improve your condition (postural supports, bracing, orthotics, canes, walkers, and exercise equipment).
8. An opportunity to interact with a healthcare professional one-on-one and ask questions about health, wellness, and injury prevention.

9. A source of referral for other necessary and appropriate treatment such as personal training, exercise classes, support groups, therapeutic supplies, and other healthcare professionals.

What if I want to start physical therapy?

In Ohio, individuals have direct access to physical therapy, meaning a prescription is not required; however, not all insurance companies will pay for physical therapy if you do not have a prescription. If you are not sure how your insurance works, call your insurance company prior to scheduling an appointment. If your primary insurance is Medicare, you can call and schedule an appointment for therapy now. After your evaluation, we will send a plan of care to your physician, and he/she will need to sign it. Regular communication with your physician will be maintained to ensure quality interdisciplinary treatment.

Posture Training Support

A brace known as a weighted kypho-orthosis, or postural support brace, can be worn to help improve posture and lessen discomfort in individuals with osteoporosis. The brace is worn in a manner similar to a backpack with a weight positioned just below the shoulder blades in the midback region. The weight varies depending on the severity of the curvature in the spine, but may weigh as little as ¼ pound to as much as 1 pound. The weight counteracts the tendency to bend forward and increases postural awareness. Additionally, the weight in the brace shifts the center of gravity causing the spine to move into a more normal, upright position. The positional change can help relieve pain. Recommended wearing time varies, although recent research reports benefits from wearing the brace just two times per day for 30 minutes each time. During wearing time, the individual is encouraged to do extension exercises to further promote proper spinal alignment.

Please contact us if you are interested in learning more about this type of bracing. Physical therapists can measure you for proper fit and instruct you in appropriate exercises to get the maximum benefit from your brace.



Resources For You

The National Osteoporosis Foundation

www.NOI.org

Mayo Clinic's Women's Health Center for Osteoporosis

mayoclinic.com

Osteoporosis and related Bone Diseases National Resource Center

www.orbdnrc.org

The National Institute on Aging

www.nih.gov/nia

Fact

Vertebral fractures can result in shortening of the spine with a forward curvature called kyphosis, which can lead to a multitude of other problems.

Resources used in the development of this guide.

1. Boning up on osteoporosis: A guide to prevention and treatment. National Osteoporosis Foundation. 2003.
2. Exercise: A guide from the National Institute on Aging. U.S. Department of Health and Human Services. 2004.

Osteoporosis and You! Marchman, KL & Zolna, J. 1999. The Arthritis Foundation. Atlanta, Georgia

Comprehensive Physical Therapy Center

Comprehensive Physical Therapy Center (CPTC) has three offices conveniently located in Hyde Park, Mason, and Milford. You will be evaluated by a licensed physical therapist, who will objectively assess your strength, balance, flexibility, and mobility. The therapist will help you establish goals for your treatment and train you in appropriate techniques to work toward your goals. Each visit you will have one-on-one care individualized to meet your needs. In addition to training in musculoskeletal and neuromuscular conditions, we have therapists who specialize in balance, manual techniques, TMJ disorders, and pelvic floor conditions. Please contact us if you have any questions or would like to schedule an appointment.

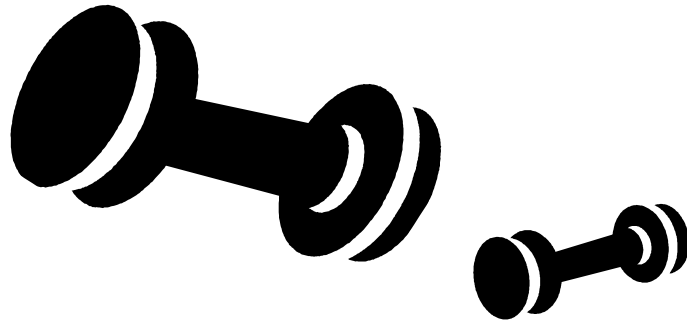
Locations:

Hyde Park (513) 871-5571

Mason (513) 336-7725

Milford

(513) 576-6338



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