

CU SPORTS MEDICINE

## Exercise for Building Better Bones

Exercise is an important link in the overall strategy for improving the health of your bones. The best exercise program for preventing osteoporosis has not yet been developed. These guidelines are based on our present knowledge. We do know that exercise works best when you have adequate levels of estrogen, calcium intake, and vitamin D.

Even though we think of bones as solid, rocklike structures, they are actually a living tissue that is constantly changing. Peak bone mass usually occurs between age 20 and 30 and then slowly declines. Bone loss increases during the first several years following menopause. Bone health depends on:

- the foods we eat
- the amount of physical activity we perform
- various environmental and genetic factors

**If you have been diagnosed with osteoporosis or osteopenia, check with your physician before starting any exercise program.**

### Posture and Body Mechanics

How we work, play, sit and move can determine the chronic stress placed on our spine. Viewed from the side, the spine is shaped like an S-curve. It is ten times stronger when you maintain these natural curves. Good posture and body mechanics can ease or prevent back pain and protect your spine against fracture.

#### *Posture*

- When standing, an imaginary vertical line should connect your ear, shoulder & hip.
- Don't lock your knees. Stand with your feet straight ahead or slightly turned out.
- Don't let your stomach muscles sag.
- Maintain a normal (not flat or exaggerated) curve in your low back.

#### *Sitting*

- Do NOT sit or stay in the same position for long periods of time.
- Sit in a firm, straight-back chair with your buttocks all the way back.
- Use a lumbar roll to maintain the natural curve in your low back.
- Tuck your chin in and pull your head straight back.
- To get out of a chair, slide forward without slouching and then stand up.



### *Moving & Lifting:*

- Keep an upright back.
- Use your legs when you lift even the lightest object. Keep a wide base of support. Squat down, keeping your chest upright.
- Avoid forward bending. If you must lean forward, bend where your legs meet your trunk, NOT at your waist.
- When lifting, hold objects close to you. Keep the activity close to your body.
- Avoid twisting movements. Always point your feet in the direction you're moving.

It requires lots of practice before new ways of performing daily tasks become a habit. But the payoff is long-term back health. Observe how many times you bend over and how many hours you're sitting during a typical day. (Things like cleaning the bathtub, picking up a child, reaching for your workout bag or purse, gardening, commuting, watching t.v. or working on the computer all count.) Start off with just a few changes. Make an effort to be aware of your movements and protect the normal curves of your spine.

### **Flexibility**

Much of our day is spent sitting or bending. This can tighten some muscles and put a lot of stress on the spine. As part of an overall program of stretching, develop good flexibility in your spine, hamstrings (back thigh), hip flexors (front thigh) and pectoral (chest) muscles. Avoid forward bending exercises as these can put stress on the bones and discs of the spine. Stretch the muscles to a point of tension, *not* pain. Hold the stretch for 15 to 30 seconds at least 3 to 5 times a day or as directed by your physical therapist.

### **Strength Training**

Strength training is probably one of the most important things you can do to build or maintain strong bones. Exercise causes muscles to pull on their bony attachments. This stimulates bone formation. If you want to increase bone mass in a particular bone, the exercise must *recruit muscles that attach to that bone*. It appears that a certain strength training intensity stimulates bone growth. You must challenge a muscle to fatigue. This happens after about 8 to 10 repetitions and should be done 2 to 3 times a week. It is important to gradually increase resistance as your muscles become stronger, instead of cruising through a workout that has become easy. Using free weights appears to stimulate bone growth in the hips (probably due to weight-bearing). To increase bone density in the spine, utilize either free weights *or* exercise machines. Have an exercise professional design a well-balanced strength program for you involving major muscle groups, particularly in the hips, wrists and spine (common osteoporosis fracture sites). Learn proper exercises for the upper and lower back and abdominals to give you strength for good posture.



### **Weight Bearing Exercise**

Weightlessness experienced by astronauts and immobilization imposed by long-term bed rest cause bone loss. Each time we step, jump, run, or balance on part of our body, the impact causes force on the bone that encourages bone building. That's why it is important to participate in regular weight-bearing exercise appropriate for your fitness level and current bone health. For example, all of these can be good exercise choices for bone building:

- very fast walking
- uphill walking
- stair-stepping
- jumping rope
- jumping activities
- high-impact aerobics
- jogging
- certain types of dancing
- soccer
- tennis
- squash
- basketball

High impact forces and a variety of movement patterns cause a stronger bone response. However, your strength, heart health, and bone integrity must be adequate for safe exercise. *Your doctor or physical therapist can tell you what is safe and effective for you.*

Strength training exercises done standing (or when balancing your weight on a leg or hand) are also an important part of a weight-bearing exercise program.

### **Balance**

Good levels of strength and flexibility guarantee that you will keep your balance more easily. To help prevent falls, activities that require balance are also good to practice. Many forms of dance and martial arts training (including tai chi) can promote good balance.

Here is a simple exercise:

Practice standing on one foot for 30 seconds. Repeat with the other leg. When you can do this easily, try it with your eyes closed or while moving the “air leg” forward-and-back or out-and-in.

There are all kinds of balance games and activities you can do. Just remember to progress gradually and provide for something to grab if you need a balance check.

**As an adolescent or young adult, exercise can boost your bone mass. After the mid-thirties, success means keeping the bone you have (or slowing the rate of bone loss). Whatever your age, exercise is good medicine for your body *and* your bones.**