Bones, Muscles and Brains:
Your Aging Strong Plan

American Bone Health and
Cabot Creamery Co-operative

AMERICAN
BONE HEALTH

From Our Co-operative Of Farm Families Since 1919
CABOT®

Acknowledgements

American Bone Health recognizes the farm families of Cabot Creamery Co-operative for designing this booklet to help adults stay active and independent as they age. A special thanks to Kelly Schriver, FAND, MS, RDN, LD, Paul Moore, PhD, RD, CSSD, LDN, CSCS and Margaret Chesson PT for their review and contributions to the content.

Here's to aging strong!

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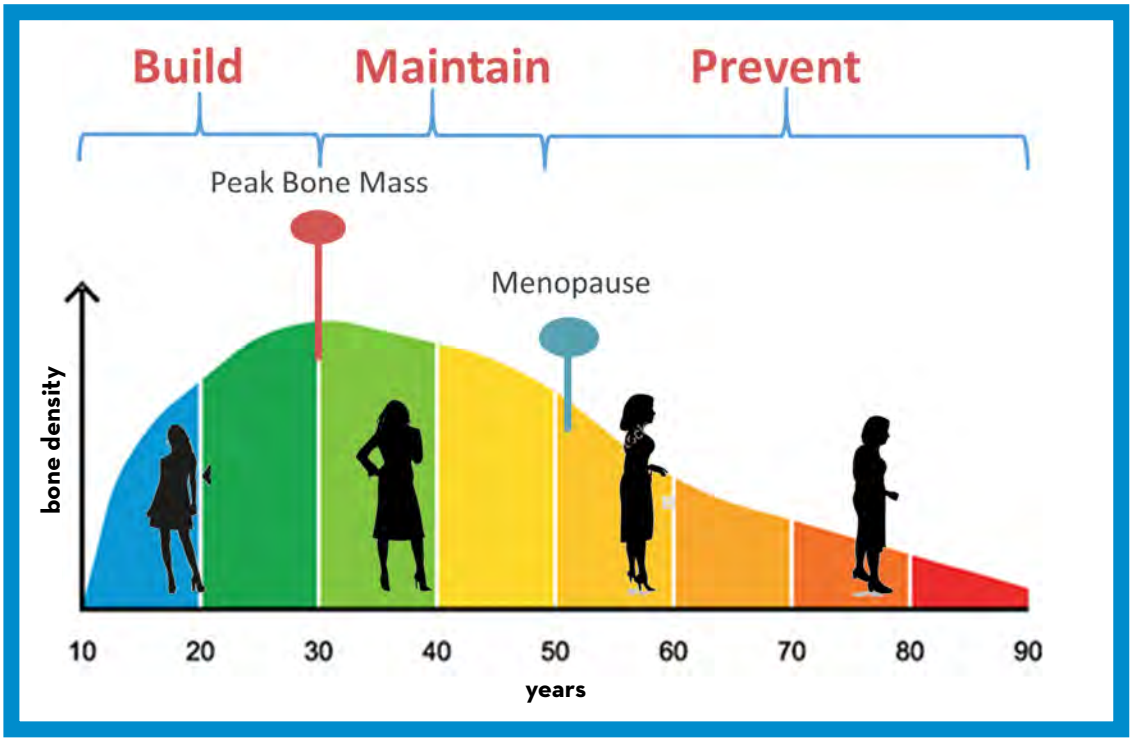
www.americanbonehealth.org

American Bone Health Hotline: 888.266.3015

How Bones Change

Key Take Home Messages

- Bone and muscle strength are key to preventing falls, fractures, and being independent as you age.
- After age 50, you can lose bone and muscle mass each year.
- Prevent bone and muscle loss with safe and weight bearing activity.



Bone is living tissue. Throughout life, your body breaks down old bone and replaces it with new bone. During childhood, the bone forming cells work faster than the cells that are breaking down bone. The skeleton grows very rapidly during the teen years until 'peak bone mass' around age 30.

The bone "remodeling" process stays balanced from peak bone mass until around menopause for women (and about age 70 for men). At menopause, because of the decrease in estrogen, there is a rapid period of bone loss. During the five years around menopause, women can lose 25-30% of their bone mass if prevention strategies are not adopted.

Men continue to lose bone density at a steady but slower rate than women. At about age 70, the reduction in their hormone levels begins to cause more rapid bone loss.

Goals at each stage of life

Children and Young Adults: Build

Adult through Mid-life: Maintain bone and muscle mass

After menopause: Prevent bone loss, falls and fractures

Fracture Risk

Key Take Home Message

- If you know the factors that increase your fracture risk, you can work with your health care provider on a bone health plan.

Key Fracture Risk Factors

Age and gender are the biggest drivers of fractures. Women are far more likely to fracture than men. In fact, one in two women over the age of 50 will have a fracture in her lifetime. This is because women's bones, even at their best (age 25–30), are generally smaller and less dense than men's bones. In addition, women lose more bone density than men as they age because of the loss of estrogen at menopause. There is increasing research in men showing that 25% of men over age 50 will have a fracture in their lifetime.

Medical Conditions That Increase Risk

- **Diabetes** – excess blood sugar affects collagen in the bones, making them brittle and more likely to break; diabetes medicines also increase risk
- **Rheumatoid arthritis** –inflammation around the joints causes bone loss; pain leads to reduced activity
- **Inflammatory diseases needing prednisone or steroid oral medications** – steroids (>5 mg/day) cause rapid bone loss by affecting bone remodeling
- **Cancer treatment/chemotherapy/radiation** affects bone formation
- **Long standing malnutrition or malabsorption** such as **lactose intolerance, Celiac or Crohn's disease** prevents absorption of calcium
- **Chronic liver disease** affects bone remodeling
- **Organ transplant** affects bone remodeling

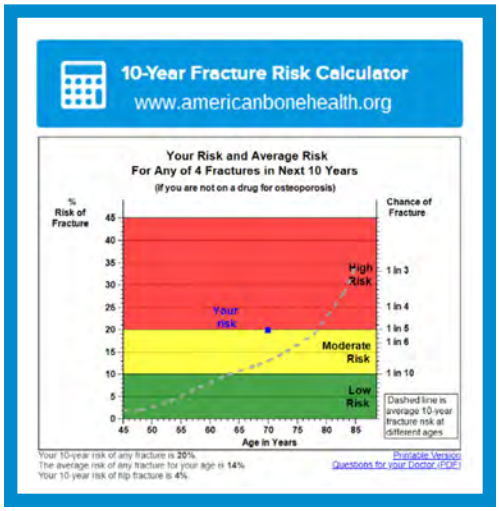
Medications That Increase Risk

- **High doses of thyroid medicines** >250 mcg per day over a period of years
- **More than 5 mg/day of prednisone** or other steroids for 3 months or longer cause rapid bone loss

Lifestyle Choices That Increase Risk

- **Smoking**
- **Excess alcohol**

Although osteoporosis is a silent disease, you can learn your risk. The American Bone Health Fracture Risk Calculator asks a series of questions to determine level of risk. Then you can talk to your health care provider about the steps you should take to keep your bones strong and prevent fractures. Complete the survey and click on **"Calculate Risk".**



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Medications

that can cause bone loss and contribute to osteoporosis

Medication	Impact on bone	Used for	Common brands
Steroids or corticosteroids	Negatively affects bone building process	rheumatoid arthritis, asthma, Crohn's disease,	Prednisone, prednisolone, Medrol, Deltasone, Decadron, cortisone, Cortel, Celestone, Aristocort, beclomethasone
Thyroid (>250 mcg)	Interferes with bone-repair and bone-building	Hypothyroidism	Synthroid, Levothroid, Levoxyl, Unithroid, Armour Thyroid
Antacids with aluminum	Negatively affects calcium and phosphate absorption	heartburn, acid reflux, indigestion, Stomach ulcers, excess stomach acidity	Aludros, Amphojel, Gaviscon, Gelusil, Kolantyl, Maalox, Mylanta, Riopan
Proton pump inhibitors	Inhibits calcium absorption	acid reflux, stress gastritis, peptic ulcers	Zantac, Protonix, Prilosec, Aciphex, Dexliant, Axid, Nexium
Some antibiotics	Impairs healthy bone structure and function	bacterial Infections	Declomycin, Dynacin, Terraymcin, Achromycin
Anticonvulsants	Inhibits vitamin D metabolism in liver	seizures	Dilantin, Phenobarbital, Depakote
Loop Diuretics	Causes calcium, potassium and magnesium excretion in urine	high blood pressure, congestive heart failure	Bumex, Edecrin, Lasix, Demadex
Blood thinners	Inhibit calcium absorption and bone-building	heart and vascular disease	Heparin, Coumadin, warfarin
Lithium	Increases parathyroid lead to increased bone resorption	bipolar disorder	Eskalith, Eskalith- CR, Lithobid,
Chemotherapy /Methotrexate	Prevents bone formation	rheumatoid arthritis, psoriasis, breast cancer	Rheumatrex Dose Pack, Trexall, Adriamycin, Adriamycin RDF, Rubex, Adriamycin PFS
Progestin-based contraceptives	May increase bone destruction	injectable contraceptive	Depo-Provera
Premenopausal cancer drugs	May cause increased bone destruction	Synthetic antiestrogen used for breast cancer	Tamoxifen
Thiazolidinedione	Inhibits bone formation	Type II diabetes	Actos and Avandia

If you are on any of the medications listed, check with your health care provider about your bone health.
If you are taking FOUR or more medicines you are at greater risk of having a fall.
Review your medication with your health care provider regularly.

Take a moment to read the small print on the package insert that comes with your medicines. You will see in the section on side effects that some can harm your bones. Some drugs can cause bone loss, some may increase your risk of a fall, and some may increase the chance of breaking a bone. If you have certain diseases, you may not have a choice but to take one of these medicines. If you do take certain medicines that can cause bone loss or increase your risk of breaking a bone, it is very important to take extra steps to protect your bones.

Learn more here.

Talking With Your Health Care Provider About Fracture Risk

Be your own best advocate. Understand your risks and prepare for your visit with your health care provider. **Here is a check list to use.**

Steps to Take When You Know Your Fracture Risk

LOW FRACTURE RISK	MODERATE FRACTURE RISK	HIGH FRACTURE RISK
Step 1: Get a Bone Density Test		
Congratulations! A bone density test may not be necessary at this point.	**Get a Bone Density Test** if you have not. If your T-score result is < –1.5, see an osteoporosis specialist.	**Get a Bone Density Test** if you have not had one in 2 years.
Step 2: Medications		
If you are on osteoporosis medications, see your doctor to find out why.	✔ Your doctor may recommend a bone medication. Your preferences, how healthy you are, and your risk of falling will be important to discuss with your doctor as you make a decision. ✔ If you have been on an osteoporosis medication for >3 years, speak with an osteoporosis specialist. ✔ If you are taking medication(s) for a serious chronic condition, speak with your doctor to see if they cause bone loss or increase fall risk.	Your doctor will make a good case for starting a bone medication to reduce your chance of having a fracture. You will likely benefit from treatment. ✔ If you are NOT on osteoporosis medication, speak with your doctor to see if you should be. ✔ If you have been on an osteoporosis medication for >3 years, speak with an osteoporosis specialist. ✔ If you are taking medication(s) for a serious chronic condition, speak with your doctor to see if they cause bone loss or increase fall risk.
Step 3: Exercise and Body Mechanics		
Weight-Bearing Activity loads the skeleton and prevents bone loss, but modify your exercise (strength training, yoga, Pilates, etc.) to protect your bones. Avoid forward flexion (rounding your back), extreme twisting, and extreme side bending. Do posture and balance exercises daily.		**Balance and Strength Training** can prevent falls. Work with an exercise specialist or physical therapist to develop a program to improve upper-body and lower-body strength and balance.

Step 4: Daily Calcium Intake (Applies to all risk levels)

Daily calcium from food and supplements should = 1,000–1,200 mg. *Read nutrition labels for calcium and vitamin D!*

- ✔ On days that you eat 2–3 servings of dairy or calcium-rich foods, you may not need a calcium supplement. On days you don't eat 2 servings of calcium-rich foods, you may need a supplement.
- ✔ If you do not eat dairy foods, you need to find other calcium-rich foods or take a calcium supplement (only 500–600 mg at a time).

Step 5: Vitamin D (Applies to all risk levels)

Vitamin D is needed for calcium to be absorbed. Few foods provide vitamin D. Exposure to the sun provides vitamin D, but it is not reliable or recommended. Take a vitamin D supplement to get 25–50 mcg (1,000–2,000 IU) per day.

Step 6: Quit Smoking (Applies to all risk levels)

Smoking increases fracture risk.

Step 7: Limit Alcohol (Applies to all risk levels)

Having 3+ drinks a day affects vitamin D levels, nutrition, and fall risk.

Step 8: Make Your Home Safe (Applies to all risk levels)

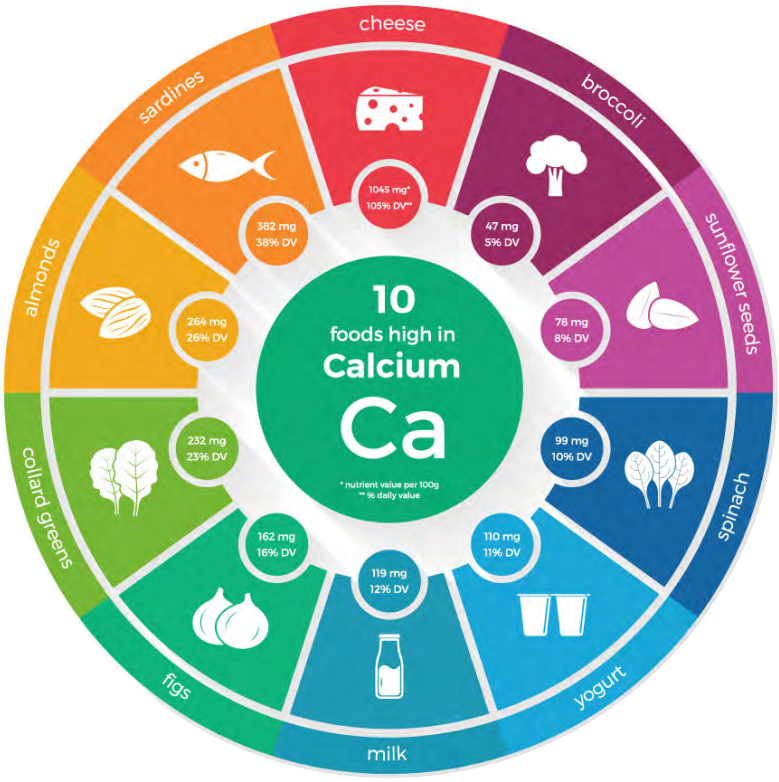
Add grab bars and night lights, remove loose rugs, be aware of pets and other trip hazards, use handrails, watch where you put your feet, and don't multi-task.

If you have any changes in your health, your risk results may change.

Healthy Foods & Habits for Strong Bones and Healthy Bodies

For good health enjoy foods from a variety of food groups; fruits, vegetables, dairy, lean meats and whole grain breads, cereals, pasta, brown rice and more. Limiting added sugar and salt and cutting back on fat and alcohol can promote wellness and disease prevention.

Several vitamins and minerals play a role in building, preserving, and protecting skeletal health. CALCIUM is important for optimal bone health throughout your life. Adults need 3 servings of calcium-rich food every day, as food is the ideal source. Good dietary choices can provide enough bone-building calcium from food alone.



Vitamin D helps calcium absorption

- The RDA is 600-800 IU. Your healthcare provider may prescribe a vitamin D supplement that exceeds that amount.
- Calcium needs vitamin D to get absorbed in the intestine; therefore, most milk you find at the grocery store will be fortified with vitamin D.
- Sunscreen blocks vitamin D production in the skin.

If your healthcare provider recommends a calcium supplement, consider:

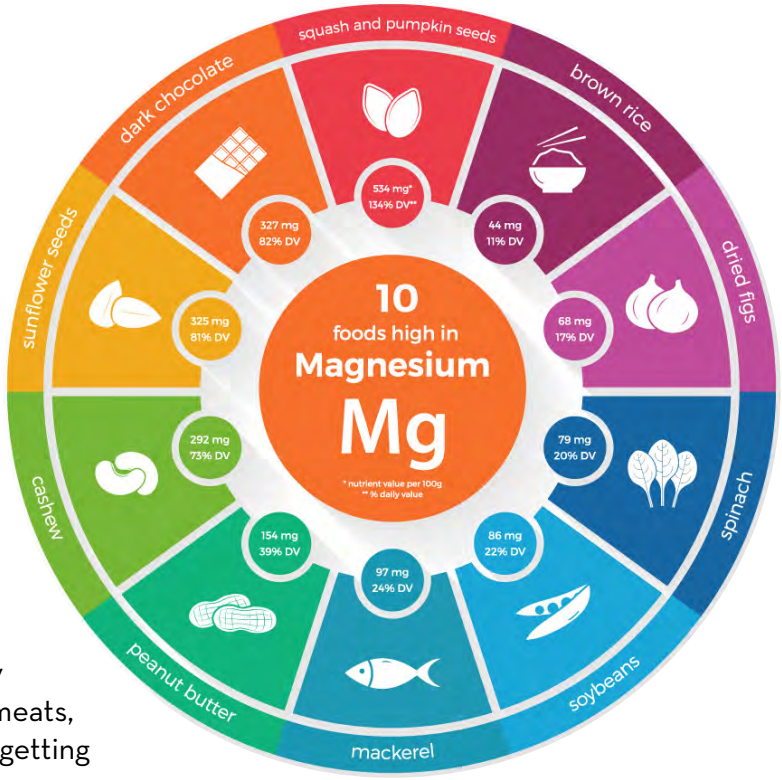
- The Recommended Dietary Allowance (RDA) for calcium is 1200-1500 IU; however, the body can only absorb 500-600 mg at a time.
- Dividing the dose and taking at 500 mg or less at different times of the day, especially with food, will maximize absorption.

There are two types of calcium supplement:

- Calcium carbonate supplements, tend to be less expensive, but should be taken with food.
- Calcium citrate, is easier on the stomach and may be taken with or without food.

* Supplementation should be discussed with your health care provider. There may be contraindications, timing of supplementation, or other considerations that should be understood. For example, calcium and iron supplements should be taken separately. And do not exceed the recommended dosage, as more is not necessarily better and could be potentially dangerous.

Magnesium is a mineral that plays an important role in maintaining healthy bones by contributing to increased bone density and helping to prevent the onset of osteoporosis. Magnesium also supports muscle health and is available with a healthy, balanced diet. The RDA for magnesium is 420 mg for adult men and 320 mg for women.



Protein is a macronutrient that is essential to building muscle mass. For older adults with sarcopenia, a condition characterized by loss of skeletal muscle mass and function, a focus in eating adequate protein should be addressed. By enjoying a high-quality protein like eggs, beans, fish, tofu, lean meats, or dairy foods, at most meals or snacks, getting enough protein should not be an issue.

Sources of Protein:

- Meat, poultry, or fish
- Beans
- Nuts and nut butters, seeds
- Eggs
- Dairy foods- milk, cheese, yogurt

Chai Mango Banana Oatmeal

⅓ cup rolled oats
⅓ cup milk
¼ cup Lowfat Vanilla Greek Yogurt
½ teaspoon ground cinnamon
⅛ teaspoon ground cardamom
pinch of ground cloves, ground ginger & nutmeg
¼ cup diced mango
½ medium banana, sliced
1 teaspoon toasted unsweetened shredded coconut
1 teaspoon toasted crushed almonds

COMBINE the oats, milk and yogurt in a small bowl or jar. Add the cinnamon, cardamom, cloves, ginger and nutmeg. Stir to combine. Cover and refrigerate overnight or for at least 6 hours. **TOP** with mango, banana, coconut and almonds before serving.

Healthy Foods & Habits for Mental Health & Memory

Healthy Foods for a Healthy Brain

- Fish or a fish oil supplement that is rich in omega-3 fatty acids EPA and DHA.
- Anti-inflammatory foods, like fruits, vegetables, and teas. Berries are particularly high in antioxidants like flavonoids and anthocyanins.
- Curcumin, a compound found in high concentrations in turmeric root, is a potent antioxidant.
- Cocoa is also high in antioxidants.
- Vitamin D-fortified foods, like milk and cereal, provide most of the vitamin D in the America diet; however, getting vitamin D levels checked may help determine the need for a supplement.
- Limit or avoid refined carbs (cakes, cereal, cookies, white rice, and white bread), alcohol, and added sugar.

Healthy Habits

- Exercise and train your brain.
- Maintain a healthy weight.
- Recognize the signs of your body's response to stress.
- Talk to your health care provider. Effective treatments can help if your stress is affecting your relationships or ability to work.
- Get regular exercise and adequate sleep.
- Try relaxing activities like meditation, muscle relaxation, and/or breathing exercises.
- Be gentle with yourself and do not overcommit.
- Stay connected to friends and family. Keeping in touch with people who can provide. emotional support and practical help can reduce stress.

Adapted from National Insitute of Mental Health

Lassi Drink with Cucumber

1 cup plain Greek yogurt
½ cup ice water
1 small cucumber, peeled, ends trimmed, cut into quarters
⅛ teaspoon ground turmeric
Generous pinch salt
Fresh lemon juice to taste
Finely shredded mint, for garnish

PUREE yogurt, ice water, cucumber, turmeric and salt in a blender until completely smooth. Add lemon juice to taste. Enjoy immediately garnished with mint if desired.

Healthy Foods & Habits for Good Sleep Hygiene

An ongoing lack of sleep or poor-quality sleep increases your risk of health problems, such as cardiovascular disease, high blood pressure, diabetes, depression, and obesity. Sleep disorders are also linked to memory problems, forgetfulness, and more falls or accidents.

Healthy Foods

There are indications that certain foods can make you sleepy or promote better sleep:

Take 2-3 hours before bed

- Kiwi
- Tart Cherries and Tart Cherry Juice
- Milk
- Fatty Fish, such as salmon
- Nuts, such as almonds, walnuts, pistachios, and cashews
- Rice

*Avoid eating large meals or drinking caffeine or alcohol late in the day.
Source

Healthy Foods

- Aim for 7-9 hours of sleep each night.
- Go to bed and wake at the same time every day, even on weekends.
- Find ways to relax before bedtime each night.
- Exercise at regular times each day.

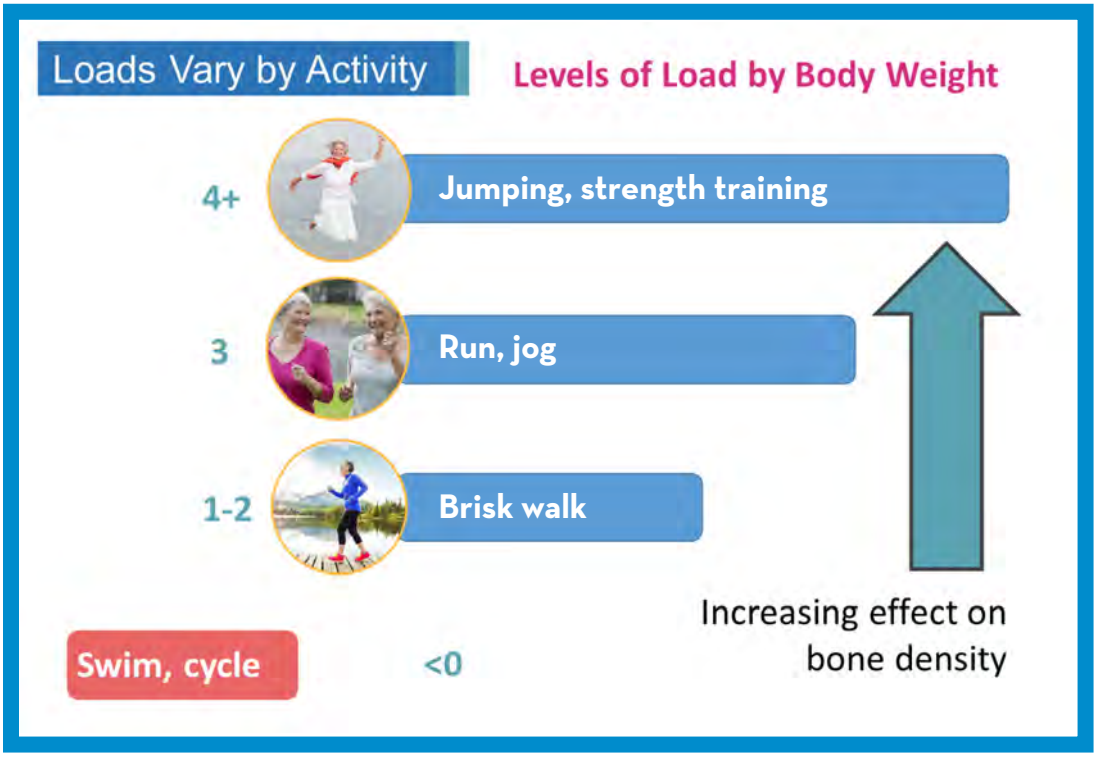
Avoid

- Long naps (over 30 minutes) in the late afternoon or evening.
- Distractions such as cell phones, computers, and televisions in your bedroom.
- Exercise or eating too close to bedtime.

Exercise and Safe Movements

Key Take Home Messages

- Bones like load and surprise.
- Exercise and activity choice is dependent on the fragility of your bones. Modify exercise and physical activity to prevent fractures.
- Forward flexion (rounding forward) and twisting movements put the spine at risk of fractures.
- Using good posture and body mechanics are important habits to perfect.



Think of load as multiples of body weight. The more body weight or load involved in an activity, the more effect on bone density. When you swim or cycle, you are not adding any body weight or gravity. If all you do is swim, you could actually lose bone density. Walking or brisk walking loads 1 to 2 times body weight and can help prevent bone loss. If you run or jog, the greater impact with the ground loads 3 times your body weight. To build bone density, you need loads of at least 4 times body weight. Get this by jumping or strength training.

Fractures Can Happen in People Who Don't Have Osteoporosis

67% of patients with a classic osteoporotic fracture of the spine, hip or wrist have a bone density classified as osteopenia. Only 33% of people who have a fracture have osteoporosis. Thus, a significant proportion of patients with osteoporosis will never have a fracture; in contrast, a significant proportion of patients with osteopenia will fracture.

DO IT RIGHT! AND PREVENT FRACTURES!

The Bone-Healthy Way of Life and Exercise

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Everyday Activities

Keep your back straight. Avoid rounding your spine and shoulders.

General Lifting

Stand with feet a little wider than hips, knees in line with middle toes. Squat to lift. Hinge at hips, chest lifted, shoulders back and down. Bring object as close to you as possible.

Brushing Teeth

Keep spine long and straight, chest lifted and knees bent. Hinge at the hips instead of rounding the back to bend towards the sink.

Driving

When backing up, reach right hand behind passenger headrest to brace yourself and keep chest lifted as you rotate.

Exercising

Considerations for exercise. Avoid rounding and twisting your spine.

Core Strengthening

Avoid all forms of crunches. Do core control by pulling in abdominals as you bring one leg to 90° while pressing lower back down. Alternate touching toes to the floor.

Spinal Twisting

Avoid extreme seated or supine spinal twists. Gently rotate the pelvis and legs keeping shoulder blades on the floor.

Spinal Stretching

Avoid yoga Forward Fold and Pilates Spine Stretch. Do seated chest stretch supported by arms.

For more tips and exercises, order the complete prevention booklet by visiting americanbonehealth.org!

Geriatrics

American Bone Health is proud to have the endorsement of the Bone Health Special Interest Group of the Section on Geriatrics, American Physical Therapy Association, for this work.

It is critically important to load the bones safely, especially if you have low bone density or osteoporosis. The spine bones, especially the smaller bones in the thoracic spine between the shoulder blades, are particularly vulnerable when you are rounding forward. Twisting movements can add too much torque on the bones. If you do not use proper body mechanics, you can cause a compression fracture. To avoid compression fractures, always bend at the hips and twist with a straight spine.

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Movements for Fall Prevention

TO STRENGTHEN THE HIPS AND THIGH MUSCLES

- Feet hip-width apart, sit on edge of chair to prepare to stand.
- Feet in line with knees, hinge forward at hips, keep back straight and stand up.
- Begin to sit by hinging at hips, keep back straight reaching hips to chair.
- Lightly touch hips to chair and stand again.

TO INCREASE ANKLE MOBILITY AND CALF STRENGTH

- Stand behind chair for support. Feet hip width apart, lift heels standing on balls of feet.
- Slowly lower heels to floor. Lift toes standing on heels.
- Lower toes to the floor and relax.

TO INCREASE HIP STRENGTH AND BALANCE

- Stand with chair on right side for support.
- Standing tall, lift right leg with thigh parallel to the ground.
- Hold for 2 counts. Slowly lower leg and foot to floor.
- Repeat with standing on left leg and raise right leg. Hold for 2 counts.

TO INCREASE HIP STRENGTH AND PROMOTE BALANCE

- Stand up straight with a chair for support. Shift body weight onto left leg and foot.
- Lift right leg off floor with knee straight and toes pointed forward. Hold for 2 counts.
- Slowly lower leg, lightly touch toes to floor and lift again. Repeat 8 times.
- Repeat with standing on left leg and raise right leg. Hold for 2 counts.

The inability to stand on your dominant leg for 11 seconds is predictive of injurious fall. Incorporate these four movements into your daily routine. They will help improve strength and balance.

The top five factors leading to falls: 1) age, 2) chronic medical conditions that affect walking, 3) low blood pressure, 4) previous falls and 5) fear of falling.

Things you can do to prevent falls: 1) check your medicines, 2) get your eyes checked, 3) improve balance and strength, 4) fall proof your home.

Core & Leg Strength + **Balance & Flexibility** = **Fall & Fracture Prevention**

My Aging Strong Worksheet

Check the boxes to see if you need to make an Aging Strong Plan.

☐ **Yes**	☐ **No**	I do activities that load my bones.
☐ **Yes**	☐ **No**	I have had a bone density test.
☐ **Yes**	☐ **No**	I have great posture.
☐ **Yes**	☐ **No**	I always use great body mechanics.
☐ **Yes**	☐ **No**	I modify my exercises to protect my bones.
☐ **Yes**	☐ **No**	I have calculated my fracture risk.
☐ **Yes**	☐ **No**	I know the medicines that I take that affect my bones and balance.
☐ **Yes**	☐ **No**	I downloaded bone health questions to discuss with my health care provider.
☐ **Yes**	☐ **No**	I get 2-3 servings of calcium rich food every day.
☐ **Yes**	☐ **No**	I take a vitamin D supplement.
☐ **Yes**	☐ **No**	I get a portion of protein at each meal.
☐ **Yes**	☐ **No**	I know the foods that help my brain and memory.
☐ **Yes**	☐ **No**	I get great sleep each night.
☐ **Yes**	☐ **No**	I incorporate strength and balance exercises into my daily routine.
☐ **Yes**	☐ **No**	I have a fall proof home.

Vellas BJ, Wayne SJ, Romero L, et al. One-leg balance is an important predictor of injurious falls in older persons. J Am Geriatr Soc. 1997;45:735-738.

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