

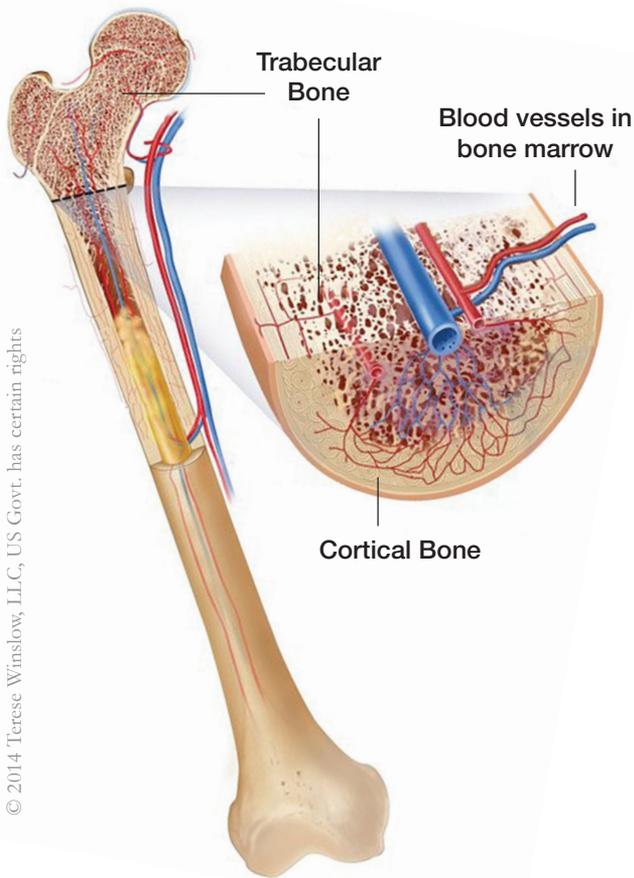


All adults should be concerned about bone health. It is especially important for anyone who has been treated for cancer. You may have had treatments that can make your bones thinner and more likely to break or fracture if you fall or get injured.

This booklet is for cancer survivors whose active treatment has ended. It explains why it is important for them to keep an eye on their bone health.

Eating a healthy diet, exercising, preventing falls, and taking bone-building drugs (if you need them) can help keep your bones strong and improve how you feel.

BONE ANATOMY



What is Bone?

You probably don't spend much time thinking about your bones. They pretty much do what you expect them to do—until they don't, like when you break a bone. But there is a lot going on inside them. Bone is living, growing tissue, made up of proteins and minerals. Your bones have two layers. The outer layer, called cortical bone, is very thick. The inner layer—the trabecular (*truh-BEH-kyoo-ler*) bone—is very spongy. Inside the spongy bone is your bone marrow. It contains stem cells that can develop into white blood cells, red blood cells, or platelets.

How Healthy Bones are Made

Our bones seem strong and permanent. But the cells inside of them are always changing. There are three types of cells that are only found in bone:

WHY THIS BOOKLET MAY NOT BE FOR YOU

For People with Bone Cancer: This booklet is **not** for people with cancer that started in the bone or bone marrow. You can learn more about cancer that starts in the bone or bone marrow on the CSC website at www.CancerSupportCommunity.org/bone-cancer and www.CancerSupportCommunity.org/multiple-myeloma.

For People with Bone Metastasis: This booklet is **not** for people whose cancer has spread to the bones from the breast, lung, prostate, or other organs. This is called “bone metastases” or “bone mets.” It is not the same as bone cancer. Learn more about bone metastases in our booklet “When Cancer Spreads to the Bone.” Find it on the CSC website at www.CancerSupportCommunity.org/BoneMets or order a copy by calling 888-793-9355.



- Osteoclasts (*OS-tee-ob-klast*), which break down the bone
- Osteoblasts (*OS-tee-ob-blast*), which form new bone
- Osteocytes (*OS-tee-ob-site*), the cells inside the bone (these cells start out as osteoblasts)

Your body's hormones control how fast the osteoclasts and the osteoblasts work. Up until age 20, the osteoblasts work faster than the osteoclasts. During this part of your life, your body builds more bone tissue than it breaks down. The more bone tissue you have, the larger and heavier your bones are. As you move through your 20s and into your 30s, the osteoclasts start working faster than the osteoblasts. This is when your body breaks down bone faster than it builds it, and your bones begin getting thinner.

Cancer and its treatments can also affect the bone-building process, causing your bones to thin more quickly.

What are Osteopenia and Osteoporosis?

As you get older, the tissue inside your bone changes. These changes make it easier for your bones to break if you fall or get injured.

The medical terms for these changes are:

- Osteopenia (*OS-tee-ob-PEE-nee-uh*)—bone tissue is thinner than normal
- Osteoporosis (*OS-tee-ob-puh-ROH-sis*)—bone tissue has become very thin and can break more easily

Osteopenia and osteoporosis are very common:

- About 43.4 million older adults have osteopenia.
- About 10.2 million older adults have osteoporosis.

Osteoporosis means “porous” bone. Porous is a word used to describe something with small holes. The image on page 3 shows that as bones become thinner, the holes become larger.

Women start out with thinner bones and lose bone more rapidly than men do. This makes them more likely to develop osteoporosis. Other risk factors include:

- Getting specific kinds of cancer treatment (see pages 5-6)
- Being small and thin
- A family history of osteoporosis or hip fracture
- Height loss or stooped posture
- Going into menopause (the time in a woman’s life when her periods stop) at age 45 or younger
- Breaking a bone after age 50
- Having rheumatoid arthritis
- Having a diet low in calcium and/or vitamin D
- Not getting enough physical activity
- Smoking
- Drinking too much alcohol

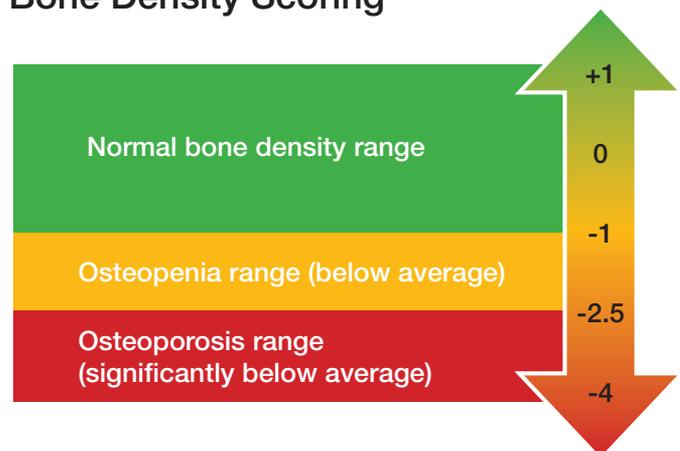
Bone Health Tests

You can’t tell if your bones are getting thinner by touching them. The only way to know if you have osteopenia or osteoporosis is to have a bone mineral density test. The “density” is determined by the amount of calcium and other minerals that are inside your bones.

Most women have their first bone density scan at age 65. But women younger than 65 who have a risk factor for osteoporosis (like a cancer diagnosis), may start earlier. Men usually have their first bone density test at age 70. Men who are age 50 to 69 and have been treated for cancer may also need to have their bone density checked. It will depend on the treatments they received.

A DEXA scan is the test most often used to measure bone density. The test uses low levels of X-rays to measure how much calcium and minerals are in the bones in your hip, wrist, and spine. The test is painless.

Bone Density Scoring



The results give you a bone density “score.”

Here is what the score means:

- 0: bone mineral density is equal to that of a 30-year-old adult
- Between +1 or -1: bone mineral density is normal
- Between -1 and -2.5: bone mineral density is low (osteopenia)
- -2.5 or lower: bone mineral density is significantly low (osteoporosis)

You may also get a Fracture Risk Assessment Tool (FRAX) score along with your DEXA score. Your FRAX score is an estimate of how likely you are to break a bone in the next 10 years. Your score is based on your age, weight, gender, smoking history, alcohol use, and whether you have had one or more broken bones in the past. Your doctor will use the scores from the two tests to decide whether you should take a bone building drug.

Bone Health After Cancer Treatment

Some cancer treatments can cause your bones to become thinner and break more easily.

Bone loss caused by cancer treatments occurs more rapidly and is more severe than bone loss that typically occurs in women and men as they age.

People with breast, ovarian, or prostate cancer are at highest risk for osteoporosis.

They often get treatments that reduce the hormones that help their cancer grow. But these same hormones also control how fast the osteoblasts and osteoclasts work. And when these cells slow down, they build new bone more slowly, resulting in bone loss.

WHO IS MOST AT RISK?

Women who have:

- Breast cancer that is treated with:
 - an aromatase inhibitor—anastrozole (Arimidex[®]), letrozole (Femara[®]) or exemestane (Aromasin[®]).
 - tamoxifen (Novadex[®]) **before** they reach menopause. For these women, tamoxifen may slightly increase the risk of broken bones. (For women after menopause, tamoxifen increases bone density.)
- Cancer treatments that put them into early menopause. This can be chemotherapy, drugs that stop the ovaries from producing estrogen, or surgery to remove the ovaries.

Men who have:

- Low testosterone as a result of cancer treatment.
- Prostate cancer that is treated with androgen deprivation therapy (also called hormone therapy or androgen suppression therapy). These include:
 - orchiectomy (surgery to remove the testicles)

- luteinizing hormone-releasing hormone (LHRH) agonists, such as leuprolide (Lupron[®], Eligard[®]), goserelin (Zoladex[®]), triptorelin (Trelstar[®]) and histrelin (Vantas[®])
- LHRH antagonists, such as degarelix (Firmagon[®])
- the CYP17 inhibitor abiraterone (Zytiga[®])
- the hormone-blocker ketoconazole (Nizoral[®])

Other types of cancer treatments can also cause bone loss in women and men. These treatments include:

- Radiation to weight bearing bones (spine, hips, legs). Radiation weakens the bone and can cause osteoporosis by damaging osteoblasts and osteoclasts.
- Allogeneic (receiving a donor's) stem cell and bone marrow transplants.
- Steroids known as glucocorticoids, such as prednisone, prednisolone, dexamethasone, and cortisone.
- Surgical removal of the stomach (gastrectomy).

Survivors of childhood cancers are also at higher risk of developing osteoporosis.

What You Can Do To Keep Your Bones Healthy

Bone health is important for people of all ages. Before age 20, you should focus on building bone. After age 20, you should try to maintain your bone density.

It is important for people who have been treated for cancer to do things to help maintain bone density. If you started taking medicine to treat osteoporosis before your cancer diagnosis, you can still take steps to keep your bones healthy. These include:

- Not smoking—it makes bone loss happen faster
- Limiting alcohol to one drink a day (for women) or two (for men)
 - Alcohol affects the cells that build new bone
 - Drinking increases the risk of falling
- Eating a diet rich in calcium and vitamin D
- Exercising
- Preventing falls

Try to get your daily recommended levels of calcium and vitamin D from the food you eat. Good sources of calcium include:

- Low-fat dairy products, like yogurt
- Kale and other dark green, leafy vegetables like spinach, collard greens, turnip greens, and bok choy, a kind of Chinese cabbage (Add kale to a fruit smoothie)

EATING FOR HEALTHY BONES

Try to get your daily recommended levels of calcium and vitamin D from the food you eat.

DAILY RECOMMENDATIONS	CALCIUM	VITAMIN D
Women ages 19 to 50	1,000 mg/day	600 IU/day
Men ages 19 to 70	1,000 mg/day	600 IU/day
Women ages 51 to 70	1,200 mg/day	600 IU/day
Women and Men 70+	1,200 mg/day	800 IU/day

- Broccoli, acorn squash, butternut squash, and okra
- Canned salmon or sardines with bones (Replace the tuna in your sandwich with canned salmon)
- Calcium-fortified foods and drinks (Orange juice, soy milk, almond milk, some cereals, breads, and tofu are often fortified with calcium and vitamin D)

- Figs, dried fruit, and almonds (Good as snacks or in hot cereal)
- Beans and peas, especially soybeans and black eyed peas

Talk to your health care provider about whether calcium and vitamin D supplements are right for you.



“I only had to make a few changes to be sure I was getting the calcium and vitamin D I need every day. I drink milk every morning and try to eat broccoli or another high-calcium veggie with dinner.”

*—Jeanne R.
ovarian cancer survivor*



EXERCISE FOR BONE HEALTH

Exercise is a key part of a healthy lifestyle that helps maintain bone density. Exercise improves balance, which makes you less likely to fall. It lowers your risk of heart disease and blood clots. Exercise can also help you maintain a healthy weight. This is important because excess weight increases your risk of your cancer coming back (recurring). Excess weight also increases your risk of heart disease.

During and after your cancer treatment, you may not have as much energy or flexibility as you had before you started treatment. Even so, you should try to move as much as you can. Talk to your doctor about what types of exercises are okay for you now. See if a local support group or cancer center offers fitness classes.

GETTING STARTED

- **Low Fitness:** Walk 10 minutes a day in your neighborhood or a mall. Set a pace where you can talk easily while walking.
- **Medium Fitness:** Walk at a brisk pace, increasing time by 5 minutes every day or two. Use music with a good beat to increase speed and time.
- **High Fitness:** Add resistance workouts, power-walk, jog, bike, or swim. Work on increasing distance, time, and speed.

Here are some tips that can help you get started:

- Try to build up to exercising 30 minutes each day.
- Find things that feel good and safe to you—walking with friends, gardening, swimming, or gentle yoga. It doesn't have to be strenuous to be exercise.
- Try to add in some resistance exercises. These exercises build muscle strength, which helps support your bones. They can also help with balance, which can help prevent falls. Examples include lifting weights and stretching with exercise bands.
- When you feel sick, exercise only as much or as strenuously as you feel comfortable.
- Allow yourself to exercise gently, slowly, and for short amounts of time.

- If you are very tired but want the energy benefits exercise can provide, try gentle, slow, and brief movements that are comfortable for you. You can always do more on a day when you are not so tired.
- If you have trouble sleeping, exercise during the day to help you sleep better at night.

Treatment with Bone-Building Drugs

If you are diagnosed with osteoporosis, your doctor will recommend that you take bone-building drugs to help reduce your risk of broken bones. (You may already be on an osteoporosis drug at the time of your cancer diagnosis.)

BISPHOSPHONATES

The drugs most often used to treat osteoporosis are called bisphosphonates (*bis-FOS-fob-nayts*). These drugs help to build bone. They include alendronate (Fosamax[®]), risedronate (Actonel[®]), ibandronate (Boniva[®]) and zoledronate (Zometa[®], Reclast[®]). You will want to know:

- Whether you will be taking the drug by mouth or getting an IV (into your vein).
 - For drugs taken by mouth, side effects include nausea, abdominal pain, and heartburn-like symptoms.
 - For drugs taken by IV, side effects include fever, headache, and muscle aches for up to three days.

- Which drugs your insurance covers.
- If there is a patient assistance program that can help cover all or part of the cost.

Rare side effects of these drugs include:

- Developing a crack in middle of the thigh bone after being on them for more than five years.
- Osteonecrosis (bone death) of the jaw after having a tooth pulled. For this reason, you should have a dental exam before starting.

PREVENT FALLS

If your bones are thin, they are more likely to break if you fall. To prevent falls:

- Wear low-heeled shoes that fit well.
- Get shoes with nonslip soles.
- Check your house—move anything you could easily trip over (electrical cords) or slip on (rugs).
- Keep rooms brightly lit.
- Put grab bars inside and outside your bath or shower (and ask for rooms that have them when you are staying at a hotel).
- Lower your mattress if it's hard for you to get out of bed.
- Consider buying a pair of walking sticks, especially if walking or hiking is your favorite type of exercise.
- Talk to your doctor about whether you should start a strength-training program. This could be a pool exercise program or involve using resistance from weights or bands.

RALOXIFENE (EVISTA®) FOR WOMEN

Evista is a pill used to reduce breast cancer risk in women at high risk for the disease. But, it is also used to treat osteoporosis in women after menopause. Its side effects include hot flashes and increased risk of blood clots.

OTHER BONE-BUILDING DRUGS

These include:

- denosumab (Prolia®), a shot given every six months. It is used to reduce bone loss in women on an aromatase inhibitor and men on a treatment that suppresses testosterone.
- teriparatide (Forteo®), a shot given daily. After two years of treatment with Forteo, another osteoporosis drug is given to maintain the new bone growth.

Take Care of Your Bones

Cancer and its treatments can affect your well-being in many ways. Eating a healthy diet, exercising, preventing falls, and taking bone-building drugs (if you need them) can help keep your bones strong, reduce your risk of broken bones, and improve your well-being as a cancer survivor.

FOR WOMEN WITH EARLY-STAGE BREAST CANCER

If you have early-stage breast cancer, your treatment often includes a bisphosphonate, typically zoledronate. This adjuvant (after surgery) therapy reduces the risk of the cancer coming back and spreading to the bones. If your doctor suggests a bisphosphonate, ask whether the treatment is for osteoporosis or for your cancer. Treatments to prevent your cancer from returning are given more often (every 6 months) and for about 3 to 5 years.

FOR WOMEN WITH BREAST CANCER AFTER MENOPAUSE

During menopause (the time in a woman's life when her periods stop), women's estrogen levels decrease, slowing the building of new bone. If you have hormone-sensitive breast cancer after menopause or if your treatments put you into menopause—you may be treated with an aromatase inhibitor. (See page 5.) These drugs lower estrogen levels even more, which can cause faster bone loss and a greater risk of broken bones. If you are on an aromatase inhibitor:

- Have bone density tests, about every two years.
- Take calcium and vitamin D supplements.
- Talk to your doctor about taking a bone building drug if your DEXA scan score is -2.0 or below or -1.5 or below and you have other risk factors that increase your chance of broken bones.
- Be treated every six months, when necessary, with denosumab (Prolia) or zoledronate (Reclast®, Zometa®).



PROSTATE CANCER & OSTEOPOROSIS

Androgen deprivation therapy (also known as hormone therapy or androgen suppression therapy) is used to treat prostate cancer. It reduces the testosterone that helps the cancer grow. But it also slows bone production. Surgery to remove both testicles (orchiectomy) has the same effect. The most rapid bone loss often occurs during the first 12 months of treatment. If you received these treatments, you should:

- Have bone density DEXA scan every two years.
- Take calcium and vitamin D supplements.
- Talk to your doctor about taking a bone building drug if your DEXA scan score is below -2.5.
- Be treated, when necessary, with denosumab (Prolia[®]), zoledronate (Reclast[®], Zometa[®]), or alendronate (Fosamax[®]).

QUESTIONS TO ASK YOUR HEALTH CARE TEAM

- Should I have a bone density test now? If not now, when? _____
- Am I at risk for osteopenia or osteoporosis? Why or why not? _____

- What are some things I can do on my own to take care of my bones to make sure they stay healthy? _____
- Are you recommending bone-building drugs? Why or why not? _____

- How long should I stay on my medication? _____

Bone Health Information for Cancer Survivors

Cancer Support Community • 888-793-9355 • www.CancerSupportCommunity.org/bone-health

Living Beyond Breast Cancer • 888-753- 5222 • www.lbbc.org/bone-metastases

LUNgevity • 844-360-5864 • www.lungevity.org

UsTOO Prostate Cancer Education & Support • 800-808-7866 • www.ustoo.org

Young Survival Coalition • 877.972.1011 • www.youngsurvival.org

Cancer Support Community Resources

The Cancer Support Community's (CSC) resources and programs are available free of charge. Call 888-793-9355 or visit www.CancerSupportCommunity.org for more info.

Cancer Support Helpline® — Have questions, concerns or looking for resources? Call CSC's toll-free Cancer Support Helpline (888-793-9355), available in 200 languages Mon - Fri 9am - 9pm ET.

Frankly Speaking about Cancer® — Trusted information for cancer patients and their loved ones is available through publications, online, and in-person programs.

MyLifeLine — CSC's private, online community allows patients and caregivers to easily connect with friends and family to receive social, emotional, and practical support throughout the cancer journey and beyond. Sign up at www.MyLifeLine.org.

Open to Options® — Need help making a cancer treatment decision? Our trained specialists can help you create a list of questions to share with your doctor. Make an appointment by calling 888-793-9355 or by contacting your local CSC or Gilda's Club.

Services at Local CSCs and Gilda's Clubs — With the help of 170 locations, CSC and Gilda's Club affiliates provide services free of charge to people touched by cancer. Attend support groups, educational sessions, wellness programs, and more at a location near you. www.CancerSupportCommunity.org/FindLocation.

Cancer Experience Registry® — Help others by sharing your cancer patient or cancer caregiver experience via survey at www.CancerExperienceRegistry.org.

Grassroots Network — Make sure your voice is heard by federal and state policy makers on issues affecting cancer patients and survivors by joining our Network at www.CancerSupportCommunity.org/become-advocate.

FRANKLY SPEAKING ABOUT CANCER: BONE HEALTH PROGRAM PARTNERS:



FRANKLY SPEAKING ABOUT CANCER: BONE HEALTH WAS MADE POSSIBLE WITH GENEROUS SUPPORT FROM:



The Cancer Support Community and its partners provide this information as a service. This publication is not intended to take the place of medical care or the advice of your doctor. We strongly suggest consulting your doctor or other health care professionals to answer questions and learn more.

This booklet is available to download and print yourself at www.CancerSupportCommunity.org/bone-health. For print copies of this booklet or other information about coping with cancer, visit Orders.CancerSupportCommunity.org.

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