



Canadian
Cancer
Society

Bone Cancer

Understanding your diagnosis



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When you first hear that you have cancer, you may feel alone and afraid. You may be overwhelmed by the large amount of information you have to take in and the decisions you need to make.

“ *All I could hear was ‘cancer.’ I heard my doctor say something like, ‘We’re going to try to get the surgery done as soon as possible.’ I didn’t hear one word after that.* ”

The introductory information in this brochure can help you and your family take the first steps in learning about bone cancer. A better understanding may give you a feeling of control and help you work with your healthcare team to choose the best care for you.

For more information

You can find more in-depth information about bone cancer on cancer.ca. Or call us at 1-888-939-3333 to learn more about cancer, diagnosis, treatment, support and services near you.

Check out our video series on common cancer topics. These short, simple videos cover subjects like *What is cancer?* and *Coping when you’re first diagnosed*.

Find the series at cancer.ca/cancerbasics.

What is cancer?

Cancer is a disease that starts in our cells. Our bodies are made up of trillions of cells, grouped together to form tissues and organs such as muscles and bones, the lungs and the liver. Genes inside each cell tell it to grow, work, divide and die. Normally, our cells follow these instructions and we remain healthy.

But sometimes the instructions in some cells get mixed up and the cells behave abnormally. These cells start to grow and divide uncontrollably. After a while, a group of abnormal cells forms a lump, or tumour.

Tumours can be either non-cancerous (benign) or cancerous (malignant). Non-cancerous tumour cells stay in one place in the body and are not usually life-threatening. Cancerous tumour cells can grow into nearby tissues and spread to other parts of the body. It's important to find and treat cancerous tumours as early as possible. In most cases, finding cancer early increases the chances of successful treatment.

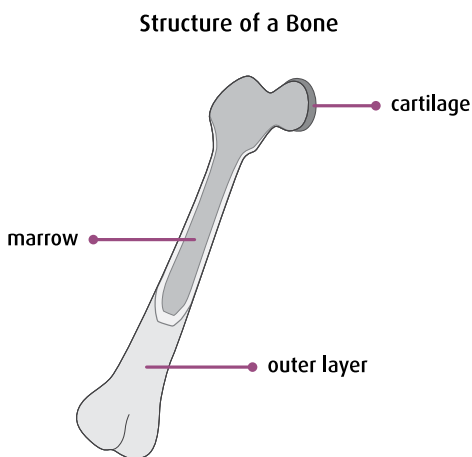
Cancer cells that spread to other parts of the body are called metastases. The first sign that a tumour has spread (metastasized) is often swelling of nearby lymph nodes, but cancer can spread to almost any part of the body.

Cancers are named after the part of the body where they start. For example, cancer that starts in the bone but spreads to the lung is called bone cancer with lung metastases.

What is bone cancer?

Primary bone cancer* starts in the cells of your bones or in your cartilage. Primary bone cancer is rare. It is not the same disease as cancer that started somewhere else in the body and spread to the bones (called secondary bone cancer, or bone metastases).

Groups of bones and cartilage form your skeleton. Bones protect organs inside the body and give the body structure and support. They store and release minerals (such as calcium and magnesium) that are important for your body. They also make and store blood cells in the marrow. Marrow is a soft, spongy material that fills most bones. Cartilage covers the ends of bones. It stops bones from rubbing together and acts like a cushion.



* This brochure is about primary bone cancer in adults. For information about secondary bone cancer or childhood bone cancer, call us at 1-888-939-3333.

Bone or cartilage cells sometimes change and no longer grow or behave normally. These changes may lead to benign tumours such as osteochondroma or enchondroma. Benign tumours are not cancerous. But in some cases, changes to bone or cartilage cells cause bone cancer.

There are several types of bone cancer. Each type behaves differently and is treated differently.

- Osteosarcoma is the most common type of bone cancer. It is found most often in the bones around the knee. Osteosarcomas can spread to other parts of the body, especially the lungs.
- Chondrosarcoma begins in the cartilage. It usually grows slowly and does not usually spread to other parts of the body.
- Ewing sarcoma of the bone begins most often in the bones of the pelvis (lower part of the abdomen), chest wall, legs and arms. It usually grows quickly and can spread to other parts of the body.

Osteosarcoma and Ewing sarcoma occur more often in children, teenagers and young adults than in older adults.

Diagnosing bone cancer

Your doctor may suspect you have bone cancer after hearing about your symptoms, taking your medical history and doing a physical exam. To find out for sure, your doctor will arrange special tests. These tests may also be used to help plan treatment.

Symptoms of bone cancer: Pain is the most common symptom of bone cancer. Other symptoms may vary depending on where the cancer is and the size of the tumour.

Symptoms may include:

- pain or tenderness in a bone or joint
- an ache that does not go away and may feel worse at night or cause a limp
- swelling or a lump over a bone
- problems moving the affected area
- a bone that breaks for no known reason

The process of diagnosing cancer may seem long and frustrating. But other health problems can cause some of the same symptoms. The doctor has to make sure there are no other possible reasons for a health problem.

Your doctor will do one or more of the following tests to make a diagnosis.

Imaging tests: The healthcare team uses x-rays, ultrasounds, bone scans, MRIs or CT scans to look at your tissues, organs and bones in more detail. They can see the size of the tumour and if it has spread. These tests are usually painless, and you don't need an anesthetic (freezing).

Biopsy: A biopsy is usually needed to make a definite diagnosis of cancer. Cells are taken from the body and checked under a microscope. If the cells are cancerous, they will be studied more to see how fast they are growing. There are many ways to do a biopsy.

For a core needle biopsy, your doctor inserts a needle through a small cut in the skin to remove one or more samples of tissue from the tumour. The doctor may use ultrasound or CT images to help guide the needle to the right spot. A local anesthetic is used to numb the area.

A surgical biopsy is an operation to remove a part or all of the tumour to look at under a microscope. This may be done with a local anesthetic or under general anesthetic (you will be unconscious). The kind of anesthetic used depends on where the tumour is and how deep it is in the body.

Blood chemistry tests: In some types of bone cancer, blood chemistry tests can show if there are abnormal levels of some enzymes. An enzyme is a protein that speeds up certain chemical reactions in the body.

Further testing: Your doctor may order more tests to find out if the cancer has spread and to help plan your treatment.

Will I be OK?

Most people with cancer want to know what to expect. Can they be cured?

A prognosis is your doctor's best estimate of how cancer will affect you and how it will respond to treatment. It looks at many factors including:

- the type, stage and grade of the cancer
- the location of the tumour and whether it has spread
- your age, sex and overall health

Even with all this information, it can still be very hard for your doctor to say exactly what will happen. Each person's situation is different.

Your doctor is the only person who can give a prognosis. Ask your doctor about the factors that affect your prognosis and what they mean for you.

Grading and staging

Once a diagnosis of cancer has been made, the cancer is given a grade and a stage. This information helps you and your healthcare team choose the best treatment for you.

A grade is given based on how the cancer cells look and act compared with normal cells. To find out the grade of a tumour, a biopsy sample is looked at under a microscope.

Low grade means that the cancer cells look and act much like normal cells. They tend to be slow growing and are less likely to spread.

High grade means that the cancer cells look and act less normal, or more abnormal. They tend to grow more quickly and are more likely to spread.

The following stages for bone cancer describe the size of the tumour and if it has spread.*

Stage	Description
1	The cancer is low grade. It has not spread to lymph nodes or any other part of the body.
2	The cancer is high grade. It has not spread to lymph nodes or any other part of the body.
3	The cancer is any grade. It has spread to other parts of the same bone but not to lymph nodes or other parts of the body.
4	The cancer is any grade. It has spread to lymph nodes, the lung or other parts of the body.

Treatments for bone cancer

Your healthcare team considers your general health and the type, stage and grade of the cancer to recommend the best treatments for you. You'll work together with your healthcare team to make the final treatment choices. Talk to them if you have questions or concerns.

For bone cancer, you might receive one or more of the following treatments.

Surgery: A decision to have surgery depends on the size of the tumour and where it is. During the operation, the tumour and some healthy tissue around the tumour are removed. Surgery is done under general anesthetic. You may stay in the hospital for several days or longer after the surgery.

* This table summarizes the stages of bone cancer according to the Union for International Cancer Control (UICC). For more in-depth information, visit cancer.ca.

Surgery is often the main treatment for bone cancer. It is often possible to remove the cancerous part of the bone and replace it with a bone graft (using bone from another part of the body or from a donor) or an artificial bone (implant). These operations avoid removing a limb and are called limb-sparing surgery. But sometimes it is necessary to remove (amputate) the limb.

The type of surgery you have depends on a number of factors specific to you. Your surgery team will discuss the different types of surgery with you.

After surgery, you may have some pain, infection or swelling. These side effects are usually temporary and can be controlled.

Chemotherapy: Chemotherapy uses drugs to treat cancer. Chemotherapy drugs may be given as pills or injected with a needle into a vein. They damage cancer cells, but they also damage some healthy cells. Although healthy cells can recover over time, you may experience side effects from your treatment, like nausea, vomiting, loss of appetite, sore mouth, hair loss or an increased risk of infection.

Chemotherapy may be given after surgery to destroy any remaining cancer cells or instead of surgery if the tumour cannot be removed.

Radiation therapy: In external beam radiation therapy, a large machine is used to carefully aim a beam of radiation at the tumour. The radiation damages cells that are in the path of the beam - both cancer cells and normal cells.

Radiation side effects depend on what part of the body receives the radiation. You may feel more tired than usual, have an increased risk of infection or notice changes to the skin (it may be red or tender) where the treatment was given.

Radiation therapy may be given after chemotherapy and before or after surgery. Sometimes, it is used instead of surgery when surgery is not possible.

For more information on treatment, you may want to read our booklets *Chemotherapy and Other Drug Therapies* and *Radiation Therapy*.

Clinical trials: Clinical trials test new ways to treat cancer, such as new drugs, types of treatments or combinations of treatments. They provide information about the safety and effectiveness of new approaches to see if they should become widely available. Ask your doctor if any clinical trials are available that could be a treatment option for you. You may benefit and so may future cancer patients.

Our brochure *Clinical Trials* has more information, including how to find a clinical trial.

Complementary therapies: Complementary therapies – for example, massage therapy or acupuncture – are used *together with* conventional cancer treatments, often to help ease tension, stress and other side effects of treatment. They don't treat the cancer itself. More research is needed to understand if these therapies are effective and how they work.

If you're thinking about starting a complementary therapy, learn as much as you can about the therapy and talk to your healthcare team. It's possible that the therapy might affect other treatments or test results.

Alternative therapies are used *instead of* conventional treatments. Alternative therapies haven't been tested enough for safety or effectiveness. Using alternative treatments alone for cancer may have serious health effects. Talk to your healthcare team before you try an alternative therapy.

Side effects of treatments

Some cancer treatments cause side effects, such as fatigue, hair loss or nausea. Because treatments affect everyone differently, it's hard to predict which side effects - if any - you may have.

Side effects can often be well managed and even prevented. If you're worried about side effects, tell your healthcare team about your concerns and ask questions. They can tell you which side effects you should report right away and which ones can wait until your next visit.

If you notice any side effects or symptoms that you didn't expect, talk to a member of your healthcare team as soon as possible. They'll help you get the care and information you need.

Living with cancer

Many sources of help are available for people with cancer and their caregivers.

Our booklet *Coping When You Have Cancer* has more detailed information and resources.

Your healthcare team: If you need practical help or emotional support, members of your healthcare team may be able to suggest services in your community or refer you to cancer centre staff or mental health professionals.

Family and friends: People closest to you can be very supportive. Accept offers of help. When someone says, “Let me know how I can help,” tell them what they can do. Maybe they can run errands, cook a meal or drive you to your doctor’s office.

People who’ve had a similar experience: Talking with and learning from others who’ve had similar experiences can be helpful. Consider visiting a support group or talking with a cancer survivor in person, over the telephone or online. Try more than one option to see which one works best for you.

Yourself: Coping well with cancer doesn’t mean that you have to be happy or cheerful all the time. But it can mean looking after yourself by finding relaxing, enjoyable activities that refresh you mentally, spiritually or physically. Take some time to find ways to cope. You may also want to talk to a counsellor for more help.

Talking to someone who's been there

If you would like to talk to someone who's had a similar cancer experience, you can connect by phone with a trained volunteer who will listen, provide hope and suggest ideas for coping – all from the shared perspective of someone who's been there.

Register for this free program at match.cancer.ca or call us at 1-888-939-3333.

Want to connect with people online?

If you'd like to join our online community, visit CancerConnection.ca. You can read news, join discussion group, get support and help others at the same time. You'll find caring, supportive people there.

After treatment

Follow-up care helps you and your healthcare team follow your progress and your recovery from treatment. At first, you might meet with one of the specialists from your healthcare team. Later on, it may be your family doctor.

The schedule of follow-up visits is different for each person. You might see your doctor more often in the first year after treatment and less often after that. After treatment has ended, you should report new symptoms or symptoms that don't go away to your doctor right away, without waiting for your next scheduled visit.

The end of cancer treatment may bring mixed emotions. You may be glad the treatments are over and look forward to returning to your normal activities. But you could feel anxious

as well. If you're worried about your treatment ending, talk to your healthcare team. They can help you through this transition period.

Rehabilitation: Rehabilitation is very important after amputation or limb-sparing surgery. Shortly after the operation, a physiotherapist will give you exercises to do. They may also plan an exercise program to help you move and walk well and avoid a buildup of fluids in the limb (called lymphedema). You may also learn how to adapt to an artificial limb (prosthesis).

An occupational therapist can design and fit you with devices to help you regain your independence.

Self-esteem, body image and sexuality: It's natural to be concerned about the effects of bone cancer and its treatment on your self-esteem, body image and sexuality. Having a limb amputated can be especially difficult. You may be worried about how your body looks after treatment, about having sex with a partner or that you may be rejected. It may help to talk about these feelings with someone you trust. Your doctor can also refer you to specialists and counsellors who can help you with the emotional side effects of bone cancer treatment.

Our booklet *Sex, Intimacy and Cancer* has more detailed information.

What causes bone cancer?

There is no single cause of bone cancer, but some factors increase the risk of developing it. Some people can develop cancer without any risk factors, while others have some of these factors but do not get cancer.

Risk factors for bone cancer include:

- previous treatment with radiation at a young age
- having a bone disorder or condition, such as Paget disease, fibrous dysplasia or osteogenesis imperfecta
- having had non-cancerous bone tumours (osteochondroma or chondroma)
- having a genetic condition, such as retinoblastoma or Li-Fraumeni syndrome
- previous treatment with chemotherapy at a young age

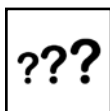
Injury to the bone does not cause bone cancer. Sometimes a doctor finds bone cancer when examining or treating a person for another reason, such as an injury that doesn't heal or pain that doesn't go away.

Canadian Cancer Society

We're here for you.

When you have questions about treatment, diagnosis, care or services, we will help you find answers.

Call our toll-free number 1 888 939-3333.



Ask a trained cancer information specialist your questions about cancer. Call us or email info@cis.cancer.ca.



Connect with people online to join discussions, get support and help others. Visit CancerConnection.ca.



Browse Canada's most trusted online source of information on all types of cancer. Visit cancer.ca.

Our services are free and confidential. Many are available in other languages through interpreters.

Tell us what you think

Email cancerinfo@cancer.ca and tell us how we can make this publication better.



What we do

The Canadian Cancer Society fights cancer by:

- doing everything we can to prevent cancer
- funding research to outsmart cancer
- empowering, informing and supporting Canadians living with cancer
- advocating for public policies to improve the health of Canadians
- rallying Canadians to get involved in the fight against cancer

Contact us for up-to-date information about cancer and our services or to make a donation.



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