

Primary Bone Cancer: Surgery



Surgery is part of the main treatment for most primary bone cancers (cancers that start in the bones). Your healthcare provider will try to remove the tumor without changing the way you look or the way your body works. For instance, if the tumor is in your arm or leg (limb), your healthcare provider will try to remove the tumor without affecting limb function.

You may be treated with chemotherapy, radiation therapy, or both to shrink the tumor before surgery. This might allow the surgeon to save more healthy tissue near the tumor.

Types of surgery for bone cancer

Many types of surgery can be used to treat bone cancers. The type of surgery you have depends on where the tumor is and the stage (extent) of the tumor, your overall health, your personal choices, and other factors.

Surgery for tumors in an arm or leg

Limb-sparing or limb-salvage surgery is the most common surgery for a bone tumor in an arm or leg. The goal is to remove the tumor and some of the normal tissue around it, while still having the arm or leg look and work as normal as possible.

The part of bone with the tumor that's removed is replaced. It may be replaced with a bone graft, a metal rod (prosthesis), or a combination of a bone graft, metal rod, and other materials. A bone graft can be taken from another part of your body. Or it might be a donated bone from another person.

Limb amputation

In some cases, the surgeon may not think all of the tumor can be removed while saving the limb. Then surgery to remove the limb, called an amputation, might be needed. The surgeon will remove the limb and some normal tissue above the level of the tumor. You will then be fitted with an artificial limb, called a prosthesis (see below).

Rotationplasty

In special cases where the tumor is in the thigh bone or around the knee, you may need surgery called a rotationplasty. In this surgery, the tumor is removed. Then the lower part of the leg is rotated halfway around (180°) and attached to the upper part of the leg. This means that your ankle becomes your new knee joint. An external prosthesis is then used to replace the lower part of your leg. This surgery sounds strange, but it can allow you to walk. In very rare cases, a surgery like this is done for arm tumors. You will have a shorter arm, but still be able to keep your hand.

Surgery for tumors in other parts of the body

If the cancer is in your lower jaw, the surgeon can remove the part of your jaw where the tumor is. Then, the surgeon will replace it with bones from other parts of your body.

Surgery to treat bone tumors in other parts of the body, such as the hip (pelvic) bones, are complex, but can sometimes be done.

If the cancer has spread to other parts of the body, like the lungs, these tumors need to be removed to have a chance at curing the cancer. These types of surgeries are complex and need to be planned carefully.

Be sure you understand the type of surgery to be done, as well as the goal of the surgery and how the outcome will affect how your body works.

Possible risks, complications, and side effects of surgery

All surgery has risks. Some of the risks of any major surgery include:

- Reactions to anesthesia
- Too much bleeding
- Blood clots in the legs or lungs
- Damage to nearby organs

Risks from bone cancer surgery

Along with the risks above, bone cancer surgery can sometimes cause these problems:

- **Pain.** The pain will often be at the incision site. If you have had part or all of a limb amputated, you may have feelings that seem to come from the amputated limb. This is normal and expected. It's called phantom sensation. At first, it may be painful. But usually, the painful feeling fades over time.
- **Infection.** Infections are uncommon after surgery, but they can happen. They tend to happen a week or two after surgery. Tell your surgeon if you have increasing pain at your surgical site, a fever that doesn't go away, chills, or drainage from your incision more than 2 weeks after surgery. Also tell your surgeon if you have swelling and redness at the incision.
- **Problems with wound healing.** Sometimes radiation, chemotherapy, or both, can delay wound healing. The surgical incision may open. You may need special bandage changes. Or you may need plastic surgery with a muscle flap or skin graft to help close the wound.
- **Constipation.** You may have trouble having a bowel movement. This can be caused by using medicines (called opioids) to treat pain. It can also be from not moving much, or not eating and drinking much. If you have trouble having a bowel movement, tell your healthcare provider so you can get treatment.
- **Broken grafts or rods.** If you have had limb-sparing surgery with a graft (bone transplant) or prosthesis (metal bone and joint), it can break or become loose. Breakage is rare during the first year after surgery. It happens more often 5 to 10 years after surgery. It can sometimes be linked to lack of healing.

Even with these possible problems, the benefits of removing a tumor usually outweigh the risks.

Getting ready for your surgery

Before you go for surgery, you'll meet with your surgeon to talk about the procedure. At this time, you can ask any questions and discuss any concerns you may have. Your surgeon can give you an idea of how your body will look and work after surgery. After you have discussed all the details with the surgeon, you'll sign a consent form that says that the surgeon can do the surgery.

Your surgeon might also give you special instructions. These may include not taking certain medicines or following a special diet in the days before your surgery. Be sure to tell your surgeon about all the medicines you take, including over-the-counter medicines you may not use every day. Also be sure to tell them about any vitamins, herbs, or supplements you use. Let them know if you use marijuana or any illegal drugs.

You will also meet with the anesthesiologist. This is the provider who will give you the medicine that puts you to sleep (called general anesthesia) so that you won't feel any pain during surgery. They also keep track of you during surgery to keep you safe. They will ask about your medical history and your medicines.

What to expect during surgery



When it's time for your surgery, you'll be taken into the operating room. Your healthcare team will include the anesthesiologist, the surgeon, and several nurses.

During a typical surgery:

- You'll be moved onto the operating table.
- Someone will place special stockings on your legs. These help prevent blood clots.
- Electrocardiogram electrodes will be put on your chest. These are to keep track of your heart rate and rhythm. You'll also have a blood pressure cuff on your arm. Your oxygen will also be watched.
- You'll be given anesthesia through a small, flexible tube called an IV (intravenous) line that's put into your arm or hand.
- When you are asleep, the surgeon will do the surgery.
- A urinary catheter will be put into your bladder during surgery to keep your bladder empty.
- A breathing tube will be put in your windpipe (trachea). A machine called a ventilator will control your breathing.
- A nasogastric tube may be put in your nose. This is a suction tube that goes down your food pipe (esophagus) and into your stomach to drain your stomach contents.

What is removed during surgery and where your incisions are depend on the type of surgery you have. This is based on where the tumor is.

What to expect after surgery

Each surgery is different. You should ask the surgeon and your treatment team what to expect right after surgery. In most cases, you may expect these things:

- You'll wake up in a recovery room. You'll be watched closely by healthcare providers. Once you are awake and stable, the staff will move you to a regular hospital room.
- You'll have a large bandage that may keep you from moving one of your limbs or joints. This will stay in place anywhere from a few days to a few weeks.

- You may have plastic drainage tubes coming out of the bandage. The nurse empties these tubes. They'll be removed after a few days, when the drainage stops.
- You'll have pain and be on pain medicine. Medicine is usually given in a vein. You may be able to control it by pushing a button. This is called PCA (patient-controlled analgesia).
- You'll get fluids through a small flexible tube that's put into a vein in your arm. This is called an IV drip. You'll need this until you can eat and drink on your own. Most of the time, you'll be able to eat the day after surgery.
- You'll get antibiotics the day of surgery and sometimes for a day or two after surgery to prevent infection.
- You may have a urinary catheter for a few days. This is a tube that drains your urine.
- After surgery, you may need chemotherapy or radiation to reduce the chance that any cancer cells left will grow and spread. Having another type of treatment after surgery is called adjuvant therapy. Your surgical incision must be healed before you can start this type of treatment. Adjuvant treatment usually can start a few weeks after surgery.

The amount of time it takes to recover from surgery is different for each person. It depends on the type of surgery that was done. Most people stay in the hospital for about a week.

Before you can go home, your wound needs to look like it's healing well. This should be about a week after your operation. But it may take months for your bone to fully heal. You also need to be able to get out of bed safely. To do that, you may need physical therapy. It's important to have rehabilitation after limb-sparing surgery. This will help you learn how to use your arm or leg and make sure it's working well.

You may have problems with the wound, or have trouble moving around. If that is the case, you may go to a rehabilitation facility from the hospital for a short time before going home.

If you had a limb-sparing surgery and needed a bone graft or internal prosthesis, you may need more surgery over time. This is often needed after 10 or 20 years, but it might be needed sooner. Children may need more surgery to lengthen the limb as the other leg or arm grows. This keeps both limbs the same length.

If you have an amputation

If you have all or part of a limb amputated, you'll be fitted with an artificial limb. This is called a prosthesis. Modern technology has made artificial limbs that work very well. Many people with artificial limbs can walk, run, and even play sports. It may take a few months for your final prosthesis to be made. In the meantime, you may be fitted with a short-term one, so that you can start getting used to it.

The person who makes the prosthesis is called a prosthetist. Prosthetists are specially educated and trained in designing and customizing prostheses. You'll also see your prosthetist for adjustments. These might be done because of weight loss or gain, wear and tear on your prosthesis, or problems with skin irritation.

You'll also see a physical therapist. They will show you how to do exercises to keep the muscles around the surgery site strong and flexible. These exercises will make it easier for you to use your artificial limb. The therapist will also show you how to wrap your stump (residual limb). This is important for healing and allows you to get a prosthesis sooner.

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