

Bone Biopsy

Bone biopsy uses a needle and imaging guidance to remove a small sample of bone for examination under a microscope. Bone biopsies may be used to confirm the diagnosis of a bone disorder, investigate an abnormality, determine the cause of pain or infection, or distinguish bone tumor from other conditions. Needle biopsy is less invasive than surgical biopsy and may not require general anesthesia.

Tell your doctor about any recent illnesses or medical conditions and whether you have any allergies, especially to anesthesia. Discuss any medications you're taking, including herbal supplements and aspirin. You may be instructed not to eat or drink for eight hours prior to your procedure, and you will be advised to stop taking aspirin or blood thinner three days beforehand. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown. Ask your doctor if you will require general anesthesia. If so, plan to have someone drive you home.



What is a Bone Biopsy?

A bone biopsy is an image-guided procedure in which a small sample of a bone is removed from the body and examined under a microscope.

The procedure is often called a closed or needle bone biopsy, because it involves inserting a needle directly into the bone. Computed tomography (CT) or, in some cases, magnetic resonance imaging (MRI) is used to guide the procedure.

What are some common uses of the procedure?

Bone biopsies are performed to:

- confirm the diagnosis of a bone disorder
- investigate an abnormal area, or lesion, seen on x-ray, bone scan, CT or MRI
- distinguish bone tumor from other conditions, such as an infection
- distinguish whether a tumor is benign or cancerous
- determine the cause of an infection or inflammation
- identify the cause of bone pain.

How should I prepare?

Prior to your procedure, your doctor may test your blood to check your kidney function and to determine if your blood clots normally.

You may be instructed not eat or drink for eight hours before your biopsy. However, you may take your routine medications with sips of water. If you are diabetic and take insulin, you should talk to your doctor as your usual insulin dose may need to be adjusted.

Prior to a bone biopsy, you should report to your doctor all medications that you are taking, including herbal supplements, and if you have any allergies, especially to anesthesia. Your physician may advise you to stop taking aspirin or a blood thinner three days before your procedure.

Also, inform your doctor about recent illnesses and other medical conditions.

You may be asked to wear a gown during the procedure.

Women should always tell their doctor if there is any possibility that they are pregnant. Doctors do not perform some procedures that use image-guidance during pregnancy because radiation can be harmful to the fetus. *See the Safety in X-ray, Interventional Radiology and Nuclear Medicine Procedures page (<https://www.radiologyinfo.org/en/info/safety-radiation>) for more information about pregnancy and x-rays.*

You may need to remove your clothes and change into a gown for the exam. You may also need to remove jewelry, eyeglasses, and any metal objects or clothing that might interfere with the x-ray images.

You may want to have someone accompany you and drive you home afterward. This will be necessary if you receive sedation.

Preparation for a biopsy procedure will be similar for children. If your child is undergoing a biopsy procedure, the physician will provide you with instructions.

What does the equipment look like?

A special drill needle is used for a closed bone biopsy. This needle is generally several inches long with a hollow core to capture the bone specimen.

The CT scanner is typically a large, donut-shaped machine with a short tunnel in the center. You will lie on a narrow table that slides in and out of this short tunnel. Rotating around you, the x-ray tube and electronic x-ray detectors are located opposite each other in a ring, called a gantry. The computer workstation that processes the imaging information is in a separate control room. This is where the technologist operates the scanner and monitors your exam in direct visual contact. The technologist will be able to hear and talk to you using a speaker and microphone.

This procedure may use other equipment, including an intravenous line (IV), ultrasound machine and devices that monitor your heart beat and blood pressure.

How does the procedure work?

The physician inserts a needle through the skin and advances it into the bone. A second needle, inserted through the first needle, removes a sample of the bone. The needles are then removed. The procedure is usually image-guided.

How is the procedure performed?

Bone biopsies are usually done on an outpatient basis.

You will be positioned so that the physician can easily reach the bone that is to be sampled. A belt or strap may be used to hold you in the correct position.

If the procedure is performed with CT, you will lie down during the procedure. A limited CT scan will be performed to confirm the location to be biopsied.

The doctor or nurse may connect you to monitors that track your heart rate, blood pressure, oxygen level, and pulse.

A nurse or technologist may insert an intravenous (IV) line into a vein in your hand or arm. This will allow them to provide sedation or relaxation medication intravenously during the procedure. You may also receive a mild sedative prior to the biopsy.

The doctor will use a local anesthetic to numb the path of the needle.

A very small nick is made in the skin at the site where the biopsy needle is to be inserted.

Using image-guidance, the physician will insert the needle through the skin, advance it to the bone and then insert a second needle through the first needle, which will remove a small sample of the lesion into its hollow core. As the needle being advanced towards the lesion, additional limited CT images may be obtained to monitor the passage of the needle. After the sampling, the needle will be removed.

The doctor applies pressure to prevent any bleeding and covers the opening in the skin with a bandage. No sutures are necessary.

The doctor or nurse will remove your IV line before you go home.

You may be taken to an observation area for several hours. X-ray(s) or other imaging tests may be performed to monitor for complications.

A needle biopsy is usually completed within 30 to 60 minutes but may take longer, depending on the size of the biopsied lesion and on the difficulty reaching it with the needle.

What will I experience during and after the procedure?

When you receive the local anesthetic to numb the skin, you will feel a slight pin prick from the needle. You may feel some pressure when the biopsy needle is inserted and aching pain or pressure when the bone sample is removed.

After the procedure, the biopsy site may be sore for up to a week. You should talk to your doctor about pain medication.

You should call your doctor if there is excessive bleeding from the biopsy site, or signs of infection such as:

- increased pain, swelling, redness or warmth
- pus draining from the site
- swollen lymph nodes in the neck, armpit or groin
- fever or chills.

Who interprets the results and how do I get them?

The specimen obtained by the radiologist will be analyzed by pathologists and/or microbiologists, and it may take up to five to seven days to get the final result. The ordering physician will communicate the results to you.

What are the benefits vs. risks?

Benefits

- Needle biopsy is a reliable method of obtaining tissue samples that can help diagnose whether a lesion is benign (non-cancerous) or malignant.
- A closed needle biopsy is less invasive than surgical biopsy and can be performed using local anesthesia and moderate (conscious) sedation, while the surgical biopsy involves a larger incision in the skin and usually requires general anesthesia.
- Generally, the procedure is not painful and the results are as accurate as when a bone sample is removed surgically.
- Recovery time is brief.

Risks

- Any procedure that penetrates the skin carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- Complications following a bone biopsy are rare. However, there is a small chance the biopsy needle may break the bone or injure a nerve, blood vessel or organ nearby. There is a very small chance that the bone may become infected or weak and not heal properly.

What are the limitations of Bone Biopsy?

A bone biopsy may not be able to be performed on patients who:

- are unable to lie still during the procedure.
- have a condition affecting the immune system, which increases the chances of an infection at the biopsy site.
- take aspirin or blood thinners or have a bleeding disorder, which may increase chances for bleeding at the biopsy site.

It may be difficult to remove an adequate sample of bone tissue with a needle biopsy.

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