PROCEDURE

Bone marrow biopsy

A bone marrow biopsy uses a needle to collect marrow for laboratory testing

PURPOSE
Diagnose or monitor disorders affecting blood-cell production

PROCEDURE TYPE
Diagnostic, minimally invasive needle sampling

WHERE IT IS DONE
Outpatient clinic, procedure room, or bedside

ANAESTHESIA
Local; sedation may be offered

HOW LONG IT TAKES
15 to 30 minutes

PREPARATION
Medication review; fasting only if sedation is planned

RECOVERY
Same day; no driving after sedation

MAIN RISKS
Pain, bleeding, bruising, infection

RESULTS
Several days; specialized genetic tests may take longer

Overview

A bone marrow biopsy removes a small sample of bone marrow for examination in a laboratory. Bone marrow is the soft tissue inside certain bones where blood cells are made.

The procedure usually includes two samples. A bone marrow aspiration removes liquid marrow through a needle. A core biopsy removes a narrow piece of marrow and bone. These samples provide different information and are often collected during the same appointment.

The usual sampling site is the back of the pelvic bone, near the hip. This area provides good access to marrow and is away from major internal organs. The procedure is commonly done without an overnight hospital stay.

Why the procedure is performed

Your healthcare team may recommend a bone marrow biopsy when blood tests do not provide enough information about how your blood cells are being made.

It may help investigate:

If you are already receiving treatment for a blood or bone marrow condition, the biopsy may show whether treatment is working or whether the condition has changed.

- Unexplained low or high numbers of red cells, white cells, or platelets
- Abnormal-looking blood cells
- Suspected blood cancers, including leukaemia, lymphoma, or myeloma
- Bone marrow disorders, such as myelodysplastic or myeloproliferative conditions
- Cancer that may have spread to the bone marrow
- Unexplained fever or infection in selected situations
- The amount of stored iron in the marrow

Who should and should not have it

A bone marrow biopsy may be appropriate when the result is likely to explain abnormal blood findings, confirm a diagnosis, guide treatment, or assess treatment response. It is not automatically needed for every abnormal blood count.

The procedure may need to be delayed or planned differently if you have a serious bleeding problem, very low platelets, or take medicines that affect clotting. These factors do not always prevent a biopsy, but your team may need extra precautions.

It may also be delayed if there is a skin infection over the intended sampling site. Another site or a later appointment may be safer.

Tell your team if you cannot comfortably lie on your side or stomach, have had surgery or radiation near the pelvis, or have previously had severe difficulty with this procedure. Sedation or a different approach may be considered.

The decision should balance the information the biopsy could provide against its discomfort and risks. Ask how the result is expected to change your care.

How to prepare

Follow the treating facility's own instructions, as they take priority over general advice.

Give your team a current list of prescription medicines, over-the-counter products, vitamins, and supplements. In particular, tell them about blood thinners and medicines that affect platelets. Do not stop these medicines unless the team performing the biopsy tells you to do so.

Tell the facility about allergies, previous reactions to local anaesthetics or sedatives, bleeding problems, pregnancy, and any infection or broken skin near the planned biopsy site.

You can often eat and drink normally when only local anaesthetic is being used. If you will receive sedation, you may need to stop eating and drinking beforehand. Your facility will tell you when.

Wear comfortable clothing. If sedation is planned, arrange for a responsible adult to take you home and follow the facility's instructions about supervision afterward.

What happens during the procedure

You will usually lie on your side or stomach. The clinician identifies an area at the back of your pelvic bone and cleans the skin with an antiseptic solution. Sterile drapes may be placed around the area.

Local anaesthetic is injected to numb the skin and the tissues over the bone. This injection can briefly sting. The clinician then makes a very small opening in the skin and guides a hollow needle into the bone.

During aspiration, a syringe draws out a small amount of liquid marrow. You may feel a brief, sharp, pulling pain because local anaesthetic cannot completely numb the inside of the bone.

For the core biopsy, a different needle collects a narrow cylinder of tissue. This usually causes firm pressure, pushing, or twisting sensations. More than one sample may be needed if the first does not provide enough material.

After the needle is removed, pressure is applied to limit bleeding. A dressing is placed over the site. Stitches are not usually required.

You are generally awake. Some facilities offer medicine to help you relax, especially if you are very anxious or have found a previous biopsy difficult.

Recovery and what to expect afterward

Mild to moderate soreness at the biopsy site is common for several days. Your team may

suggest an appropriate non-prescription pain medicine. Check before taking aspirin or anti-inflammatory medicines because they can increase bleeding in some people.

You can usually eat and drink normally afterward. If you received sedation, start according to the recovery team's instructions, especially if you feel nauseated.

Keep the dressing clean and dry for the period specified by your facility. Avoid strenuous activity, heavy lifting, and vigorous exercise for at least the time your team recommends. Light daily activity is often possible later the same day.

Do not drive after sedation. You must have someone take you home, and you should avoid alcohol, operating machinery, or making important decisions for the period stated in your discharge instructions. If you had local anaesthetic without sedation, ask the facility whether any driving restriction applies.

Many people return to desk work the next day. You may need longer if your work is physically demanding, the site remains sore, or your underlying condition causes fatigue.

Risks and possible complications

Temporary pain, tenderness, and bruising are the most common effects. A small amount of blood on the dressing can occur.

Other possible complications include:

Serious injury is uncommon when the sample is taken from the back of the pelvic bone. Your personal bleeding risk may be higher if you have a clotting disorder, very low platelets, or take medicines that reduce clotting.

- Bleeding that continues or forms a collection under the skin
- Infection at the biopsy site
- Persistent or increasing pain
- A reaction to local anaesthetic or sedation
- An inadequate sample that requires another procedure

Results and follow up

The liquid marrow and core sample are examined under a microscope. The laboratory assesses the number, appearance, and arrangement of blood-forming cells. The samples may also be tested for abnormal proteins, chromosome changes, gene changes, infection, or cancer cells.

Some initial findings may be available within several days. The complete report can take longer because the core tissue must be processed. Flow cytometry, chromosome studies, cultures, and molecular tests may take one or more weeks.

Your healthcare team should explain when and how you will receive the results. A result may identify a specific condition, rule out some possibilities, or show that further tests are needed. Ask what the findings mean for treatment or monitoring rather than interpreting individual report terms on their own.

Routine follow-up may include a scheduled appointment, repeat blood tests, or discussion of treatment options. Not receiving a result immediately does not necessarily mean something is wrong.

Alternatives

The realistic alternatives depend on why the biopsy has been recommended.

Blood tests and a blood smear, which examines blood cells under a microscope, are easier and less invasive. They can identify many abnormalities but cannot fully show how cells are developing or arranged inside the marrow.

Imaging tests can show changes in bones, lymph nodes, or organs. They usually cannot identify the exact marrow cell disorder or replace laboratory examination of marrow tissue.

Aspiration alone provides liquid cells but not the structure of the marrow. It may miss scarring, patchy disease, or conditions that require a core sample.

Some blood-based genetic tests can detect specific mutations. They do not provide all the information available from marrow and may not confirm the diagnosis by themselves.

Repeating blood tests and monitoring may be reasonable when abnormalities are mild and stable. The trade-off is delayed diagnosis if an important marrow condition is present. Ask whether waiting is medically reasonable in your situation and what changes would trigger a biopsy.

When to call your healthcare team

Contact your healthcare team promptly if you develop:

Seek emergency help for heavy bleeding that does not stop after firm, continuous pressure, fainting, severe breathing difficulty, or signs of a serious allergic reaction.

Questions about dressing care, ordinary soreness, activity, or your results can usually wait for

routine office hours unless symptoms are worsening.

- Fever or chills
- Increasing redness, warmth, swelling, or drainage at the site
- Pain that is worsening rather than improving
- Bleeding that returns or repeatedly soaks the dressing
- New numbness, weakness, or severe pain near the hip or leg

Common questions

Will I be asleep?

Usually not. Most bone marrow biopsies use local anaesthetic while you remain awake. Some facilities offer sedation to make you relaxed or drowsy. General anaesthesia is uncommon.

Can I drive home?

Not if you received sedation. Arrange for someone to take you home. If you received only local anaesthetic, follow the facility's instructions because discomfort, your health condition, or other medicines may still affect driving.

How painful is it?

The numbing injection may sting. Aspiration can cause a brief, sharp pulling pain, while the core biopsy usually feels like strong pressure. Soreness afterward is common but generally improves over several days.

How long does it take?

The sampling usually takes about 15 to 30 minutes. Allow additional time for registration, preparation, pressure on the site, and recovery from sedation.

When will I know the results?

Some findings may be ready within several days. Complete results often take longer, especially when chromosome, genetic, or infection tests are needed. Your team should give you an expected reporting time.

What if the sample is not enough?

Sometimes a sample contains too few cells or is difficult to interpret. The laboratory may be able to use the other sample or additional tests. In some cases, the biopsy needs to be repeated.

Sources

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- Bain BJ. Bone marrow biopsy morbidity: review of 2003 . Journal of Clinical Pathology. 2005;58:406-408