PROCEDURE

Bone graft

A bone graft places natural or synthetic material into a bone defect to support new bone growth.

PURPOSE
Fill bone defects and support new bone growth

PROCEDURE TYPE
Therapeutic surgical placement of natural or synthetic graft

WHERE IT IS DONE
Operating theatre, outpatient surgical centre, or dental clinic

ANAESTHESIA
Local, sedation, or general, based on graft location

HOW LONG IT TAKES
30 minutes to several hours, including the main operation

PREPARATION
Medication review; fasting if sedation or general anaesthesia

RECOVERY
Same day or overnight; no driving after sedation or general anaesthesia

MAIN RISKS
Infection, bleeding, graft failure, donor-site pain

RESULTS
Healing assessed over weeks to months with examination and imaging

Overview

A bone graft places material around or between bones to help new bone grow. It can fill a gap, replace lost bone, or help bones join together. The graft usually acts as a framework that your bone grows into.

Bone grafting is often part of fracture repair, spinal or joint fusion, joint replacement revision, or dental implant treatment.

Graft material may be:

Some products also contain substances that encourage bone formation. The choice depends on the defect, your health, and the operation.

- Autograft: bone taken from your body, often the pelvis

- Allograft: screened and processed donated human bone
- Synthetic graft: manufactured material that supports bone growth
- Animal-derived graft: processed material used mainly in dental surgery

Why the procedure is performed

A bone graft may be offered when bone is unlikely to heal without added support. Reasons include:

The aim is to restore strength, improve fusion, or create enough bone to support an implant or surgical device.

- A fracture that has not healed, called a nonunion
- Bone loss after injury, infection, or removal of a cyst or tumour
- Spinal or other joint fusion
- Revision of a joint replacement
- Building up the jaw for a dental implant
- Repairing a defect caused by a birth condition

Who should and should not have it

Bone grafting may help if you have a bone gap, poor healing, or an operation requiring bones to fuse. Your surgeon should explain why it may improve the result.

Surgery may be delayed if you have an uncontrolled infection, a condition that makes anaesthesia unsafe, or a wound that cannot yet be closed. Bone infection may require antibiotics like amoxicillin or doxycycline , removal of infected tissue, or staged operations before grafting.

Poor blood flow, uncontrolled blood sugar, nicotine use, and poor nutrition can reduce healing. Your team may recommend addressing these first.

Tell your surgeon about reactions to medicines, implants, or animal-derived products. Ask about the graft source if you have personal, cultural, or religious concerns.

How to prepare

Follow the treating facility's instructions because preparation varies by operation and anaesthesia.

Provide a current list of medicines, vitamins, and supplements. Blood thinners and some anti-inflammatory medicines can affect bleeding or healing. Do not stop prescribed medicine unless the procedure team tells you to.

You may need to stop eating and drinking before sedation or general anaesthesia. Follow the exact fasting times provided.

Ask about:

Nicotine interferes with bone healing. Ask about support to stop before surgery.

- The graft source and whether bone will be taken from your body
- Any plates, screws, rods, or implants
- Limits on lifting or weight-bearing
- Transport and help at home

What happens during the procedure

You may have local anaesthesia, sedation, or general anaesthesia.

The surgeon exposes and cleans the area, prepares the existing bone, and shapes or packs graft into the defect. If an autograft is used, bone is removed through a separate incision, commonly over the pelvis, creating a second area that must heal.

Plates, screws, rods, cages, or other devices may keep the bones stable. Incisions are closed and dressed. In dental surgery, a membrane may cover the graft before the gum is stitched closed.

Recovery and what to expect afterward

Pain: Soreness, swelling, and bruising are expected. An autograft also causes pain at the donor site. Use pain relief as directed. Pain should gradually improve.

Eating: You can usually eat once awake and no longer nauseated. After jaw grafting, follow instructions about soft food and avoid chewing over the area.

Activity: Follow restrictions on walking, lifting, exercise, and weight-bearing. Do not test the area because pain has improved. After a dental graft, avoid disturbing it with your tongue or toothbrush until instructed.

Driving: Do not drive on the day of sedation or general anaesthesia, while taking medicines that cause drowsiness, or if a cast, brace, or restricted movement prevents safe control.

Work: Return may take days after a small graft or several weeks after major orthopaedic or spinal surgery.

Risks and possible complications

Possible complications include:

Donor bone is screened and processed to reduce infection transmission, but risk cannot be eliminated. A graft that does not heal may require monitoring, another operation, or different treatment.

- Bleeding, infection, or poor wound healing
- Failure of the graft to unite with bone
- Movement or loss of graft material
- Injury to nearby nerves, blood vessels, teeth, or other structures
- Lasting pain, numbness, or stiffness
- Pain, weakness, or fracture at an autograft donor site
- Reaction to an implanted graft product

Results and follow up

Healing takes weeks to months, so success cannot be confirmed immediately.

Your team will check the wound and your function. X-rays or other scans may assess new bone and stable fusion. Dental grafts may need months of healing before an implant is placed or used.

Keep follow-up appointments even if you feel well. Ask when stitches, dressings, braces, and activity restrictions will be reviewed.

Alternatives

Alternatives depend on why grafting was proposed.

Observation may suit a small, stable defect likely to heal, but healing may be slower or remain

incomplete.

Fixation without grafting avoids graft-related risks but may provide less support when bone is missing or healing is poor.

A bone-growth stimulator uses electrical or ultrasound energy for selected fractures or nonunions. It cannot correct a large gap, infection, or unstable fixation.

Synthetic material or donor bone instead of autograft avoids a second surgical site, but performance varies and these materials do not provide all the same living cells.

For a badly damaged joint, joint replacement may preserve more movement than fusion but can wear or loosen.

Dental alternatives may include a bridge, removable denture, shorter implant, or leaving the space untreated.

When to call your healthcare team

Contact your surgical team promptly for worsening redness, warmth, swelling, drainage, fever, an opening wound, or increasing pain. Also report new numbness, weakness, loss of movement, a loose dental graft, or a dangerously tight cast or dressing.

Seek emergency care for trouble breathing, chest pain, fainting, uncontrolled bleeding, sudden severe swelling of the mouth or throat, or new loss of bladder or bowel control after spinal surgery.

Routine questions about dressings, bruising, refills, activity, or appointments can usually wait for office hours.

Common questions

Will I be asleep?

Small dental grafts may use local anaesthesia while you remain awake. Larger grafts often use sedation or general anaesthesia.

Can I drive home?

Not after sedation or general anaesthesia. Arrange for a responsible adult to take you home. Pain, medication, a cast, or restricted movement may extend the driving restriction.

How painful is a bone graft?

Pain ranges from mild soreness to significant surgical pain. Autografting creates a second

painful area, but discomfort should improve during healing.

When will I know if it worked?

Placement can be confirmed after surgery, but union is assessed over weeks or months through examinations and imaging.

Does donor bone become my bone?

It mainly provides a framework into which your body grows new bone. Some graft material may be replaced over time.

Can a bone graft fail?

Yes. Infection, movement, poor blood supply, nicotine, certain medical conditions, or a large defect can prevent healing. Follow-up imaging is important because failure may not cause immediate symptoms.

Sources

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