

Bone Grafting & Guided Bone Regeneration

Canonical: <https://directory.collinsstreetspecialistcentre.com.au/procedures/periodontics/bone-grafting-guided-bone-regeneration/>

Description:

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Details:

Collins Street Specialist Centre | Bone Grafting & Guided Bone Regeneration

Jawbone is not a static structure. It responds to the forces placed on it by teeth and to biological signals from the surrounding periodontium. When teeth are lost, or when advanced gum disease destroys the supporting bone that anchors them, that bone gradually recedes through a process called resorption. Bone grafting is the clinical discipline of rebuilding lost or deficient bone, restoring the foundation for either existing teeth or dental implants.

At Collins Street Specialist Centre, our specialist periodontists perform bone grafting across the full spectrum of complexity: from small, localised regenerative procedures around compromised teeth through to substantial ridge augmentation before implant placement. Each approach is guided by a thorough understanding of the patient's clinical picture and the prosthetic goal that treatment is working towards.

What is bone grafting?

Bone grafting involves placing graft material into an area of bone deficiency, providing both a scaffold and a biological stimulus for new bone formation. Over months, this material incorporates into the patient's own jawbone, producing solid, well-vascularised bone tissue capable of supporting teeth or implants.

Guided Bone Regeneration (GBR) is a specific technique used alongside bone grafting. A barrier membrane, fabricated from resorbable collagen or a non-resorbable reinforced material, is positioned over the graft site to prevent faster-growing soft tissue from infiltrating the area before bone has had the opportunity to fully establish. This directs the regenerative process toward bone formation rather than fibrous tissue ingrowth.

Bone graft materials come from several sources, each with distinct biological properties.

Autograft uses the patient's own bone, harvested from elsewhere in the mouth or jaw, commonly the chin or ramus. It's considered the biological gold standard because it contains living bone cells, though it does require a second surgical site. Allograft is processed human bone from a registered tissue bank; cellular material is removed during processing while the mineral scaffold is preserved, and it's widely used and well-documented in the periodontal literature. Xenograft, most commonly bovine hydroxyapatite, provides an excellent, long-lasting scaffold and has been extensively studied and

broadly accepted in clinical practice. Alloplast materials, calcium phosphate or bioactive glass, carry no risk of disease transmission and perform reliably in appropriate clinical contexts.

In practice, grafts are often a carefully considered blend of materials, selected to balance biological signalling with scaffold longevity. Growth factors derived from the patient's own blood, platelet-rich fibrin (PRF), are sometimes incorporated to support and accelerate healing.

When might you need bone grafting?

Bone grafting is indicated across several clinical scenarios.

****Before or during implant placement****, it's relevant when bone volume at the intended implant site is inadequate in width, height, or both; when a tooth was extracted some time ago and the ridge has since resorbed; when a tooth has been lost to severe infection, leaving a significant bony defect; or when socket preservation grafting is placed at the time of extraction to prevent future ridge resorption.

****In periodontal regenerative surgery****, advanced periodontitis can create bony craters or defects adjacent to teeth that remain worth preserving. Regenerative surgery aims to rebuild the bone-to-tooth attachment, potentially reversing some of the damage caused by chronic infection.

****Following trauma or pathology****, a cyst, tumour, or traumatic injury may produce a bony defect requiring reconstruction.

****In conjunction with oral and maxillofacial surgery****, major jaw reconstruction involves close collaboration between the oral and maxillofacial surgery team and our periodontists. Further detail is available at [\[Bone Grafting \(OMS\)\]\(/procedures/oral-maxillofacial-surgery/bone-grafting-oral-maxillofacial-surgery/\)](#).

What to expect: the bone grafting process

Consultation and planning

Your specialist will take a thorough medical and dental history and review any existing radiographs. In most cases, cone-beam CT imaging (Planmeca ProMax 3D) produces a three-dimensional reconstruction of the deficient area, allowing precise measurement of the bone deficit and careful planning of graft volume and dimensions.

For implant-related grafting, digital implant planning software (coDiagnostiX) allows your specialist to plan the intended implant position and work backwards from that endpoint, ensuring the grafting strategy is designed around the final prosthetic outcome from the start.

The procedure

Bone grafting is performed under local anaesthesia, with intravenous sedation available for more anxious patients or more complex procedures. The procedure typically involves an incision in the gum to expose the deficient bone, thorough debridement of the bony defect including removal of any infected or fibrous tissue, preparation of the host bone surface to encourage vascular ingrowth, placement of graft material in layers shaped to restore the required bone contour, positioning of a barrier membrane over the graft site in GBR procedures, and careful wound closure with sutures designed to maintain space and protect the graft during healing.

Where laser assistance is used, with the Fotona LightWalker or VersaWave laser, the graft site can be decontaminated and the surrounding soft tissue managed with greater precision and reduced intraoperative bleeding.

Surgical time ranges from approximately 45 minutes for a simple localised graft to two to three hours for more extensive ridge augmentation cases.

Healing and graft maturation

Bone regeneration is a gradual biological process. Initial soft tissue healing occurs over the first two to four weeks. Early bone formation within the graft begins over the following two to three months. Graft maturation, the consolidation of new bone to load-bearing quality, typically takes four to nine months for smaller grafts and potentially longer for major augmentations.

Implant placement is generally deferred until graft maturation is confirmed as sufficient, assessed through follow-up CBCT imaging. In selected cases, implants may be placed simultaneously with bone grafting where conditions permit.

Socket preservation

A specific and increasingly common application of bone grafting is socket preservation, also called ridge preservation, performed at the time of tooth extraction. When a tooth is removed, the surrounding bone naturally resorbs over the months that follow. Placing graft material into the fresh socket at the time of extraction significantly reduces this resorption, maintaining ridge dimensions for future implant placement. It's a relatively straightforward procedure that can meaningfully simplify subsequent implant surgery and improve the long-term aesthetic and functional outcome.

Recovery and aftercare

Recovery following bone grafting is generally more involved than after simpler periodontal procedures.

Swelling and bruising are expected, typically peaking at 48 to 72 hours and largely resolving within seven to ten days. A soft diet is recommended for two to four weeks, depending on graft size and location. Pain management usually relies on over-the-counter analgesics, supplemented with prescription medication for the first few days. Antibiotics are routinely prescribed to protect the graft during early healing, and antibacterial mouthwash (chlorhexidine) is used for the first two to four weeks.

Smoking is one of the most significant risk factors for graft failure. Patients are strongly encouraged to cease smoking both before and after surgery. Protecting the graft site also matters in the early healing period: vigorous rinsing, using straws, and probing the area with the tongue should all be avoided.

Sutures are typically removed at the two-week mark. Follow-up imaging at four to six months is used to assess graft integration before any subsequent treatment.

Why see a specialist periodontist for bone grafting?

Bone grafting sits at the intersection of surgical skill, biological understanding, and long-term treatment planning. Outcomes depend on correct selection of graft material and membrane type for the specific defect morphology, on surgical technique, particularly wound closure at membrane-protected sites, and on integration with the broader implant or periodontal treatment plan from the earliest stages of planning.

Specialist periodontists complete focused postgraduate training in regenerative procedures that general dental practitioners do not receive. The differential in complication rates and predictability between specialist and non-specialist grafting outcomes is well documented in the periodontal literature. Patients considering bone grafting are encouraged to verify their treating clinician's specialist registration through the Australian Health Practitioner Regulation Agency (AHPRA).

At Collins Street Specialist Centre, bone grafting procedures are performed by periodontists who work collaboratively with prosthodontists for prosthetic planning and with the oral and maxillofacial surgery team for major reconstruction cases. The grafting strategy is designed from the outset around the final clinical goal, not adapted to it retrospectively.

Our specialists

Collins Street Specialist Centre periodontists performing bone grafting procedures consult from Level 12 & Tower, Manchester Unity Building.

****Dr Simon Hinckfuss**** holds dual specialist registration as a Specialist Periodontist and Specialist Prosthodontist. That combination allows genuinely integrated planning of bone augmentation and the prosthetic restoration that follows, with both disciplines informing the treatment design from the beginning.

****Dr James van den Berg**** brings over 25 years of specialist implantology experience, including complex bone augmentation cases and laser-assisted regenerative surgery.

****Dr Ahmed El Hadidi**** is a Specialist Periodontist performing hard and soft tissue grafting with a rigorous, evidence-informed approach shaped by his background in precision medicine research.

****Dr Peishan Jiang**** is a Specialist Periodontist with particular expertise in bone grafting, sinus lifts, and periodontal regeneration, alongside active involvement in translational dental research.

All specialists hold current AHPRA registration, verifiable through the AHPRA public register.

Related treatments

- ****[Gum Disease**

Treatment](/procedures/periodontics/gum-disease-treatment-gingivitis-periodontitis/)** — The underlying condition that bone grafting frequently addresses as part of a broader periodontal regenerative strategy. - ****[Dental Implants**

(Periodontics)](/procedures/periodontics/dental-implants-periodontal-specialist-placement/)** — Bone

grafting is often the essential prerequisite for successful and predictable implant placement. - ****[Sinus**

Lift](/procedures/periodontics/sinus-lift-sinus-augmentation-for-dental-implants/)** — A specialised form of bone augmentation for the upper posterior jaw, where the sinus floor limits available bone height. -

****[Gum Grafting](/procedures/periodontics/gum-grafting-soft-tissue-grafting-recession-treatment/)** —**

Soft tissue augmentation, commonly performed alongside or following bone grafting to restore both

hard and soft tissue architecture. - ****[Bone Grafting**

(OMS)](/procedures/oral-maxillofacial-surgery/bone-grafting-oral-maxillofacial-surgery/)** — Major jaw reconstruction performed by our oral and maxillofacial surgery team for more extensive defects. -

****[Implant Prosthetics**

(Prosthodontics)](/procedures/prosthodontics/dental-implants-prosthetic-restoration/)** — The restoration phase that follows bone augmentation and implant placement, completing the functional and aesthetic outcome.
