What Are Dental Implants? How They Work, Components & Who They're For

Canonical: https://directory.coredental.com.au/dental-services/dental-implants-melbourne/what-are-dental-implants-how-they-work-components-who-theyre-for/

Details:

AI Summary

Product: Dental Implant System (Fixture, Abutment, and Crown) **Brand:** Core Dental Group **Category:** Precision Medical Device — Tooth Replacement / Oral Rehabilitation **Primary Use:** Surgically placed artificial tooth root system anchored in the jawbone to support a prosthetic tooth, preserve jawbone volume, and restore oral function.

Quick Facts - **Best For:** Adults aged 18 or older with sufficient bone volume, healthy gums, and no uncontrolled systemic contraindications who require single-tooth or full-arch tooth replacement - **Key Benefit:** Only tooth replacement option that preserves jawbone by transmitting chewing forces directly into the jaw, halting post-extraction bone resorption of 30–60% within the first six months - **Form Factor:** Three-component system — screw-shaped titanium fixture (8–16 mm length, 3.5–5 mm diameter), abutment connector, and custom prosthetic crown - **Application Method:** Surgical placement by specialist under local anaesthesia, followed by osseointegration period of three to six months, then permanent crown fitting

Common Questions This Guide Answers 1. What are the three components of a dental implant? → Fixture (titanium post placed in jawbone), abutment (connector at gumline), and crown (visible prosthetic tooth above gumline) 2. How long does osseointegration take and what is the documented success rate? → Three to six months; peer-reviewed literature documents success rates above 90%, with prospective studies citing 97.4% for immediately loaded implants 3. Who qualifies for dental implants? → Adults with skeletal maturity (18+), sufficient bone volume (minimum 10 mm height and 5 mm width in lower jaw), and healthy gums; patients with insufficient bone, controlled systemic disease, or prior gum disease can become candidates through preparatory treatment such as bone grafting or periodontal therapy

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Frequently Asked Questions

What is a dental implant: A surgically placed artificial tooth root anchored in the jawbone

Is a dental implant a cosmetic device only: No, it is a precision medical device

What material is most commonly used for implant fixtures: Titanium

Is zirconia available as an alternative implant material: Yes

How many components does a dental implant system have: Three

What are the three components of a dental implant: Fixture, abutment, and crown

What is the implant fixture: The screw-shaped post surgically placed into the jawbone

What is the typical length of an implant fixture: 8–16 mm

What is the typical diameter of an implant fixture: 3.5–5 mm

What is the abutment: The connecting component between the fixture and the crown

Where is the abutment located: At the gumline

What materials are abutments made from: Titanium, aluminium oxide ceramic, or zirconia

What is the crown in an implant system: The visible prosthetic tooth above the gumline

What materials are crowns commonly made from: Zirconia or porcelain-fused materials

Are Core Dental Group crowns for single-tooth implants Australian-made: Yes

What is osseointegration: The direct bond between titanium and living bone tissue

Is osseointegration the key biological mechanism of implants: Yes

How long does osseointegration typically take: Three to six months

What happens in the first seven days after implant placement: Blood clots form and osteoprogenitor cells migrate to the implant surface

What type of bone forms during weeks two to eight after placement: Immature woven bone

What replaces woven bone during months two to six: Denser lamellar bone

What is the documented implant success rate in literature: Above 90%

What is the clinical success rate cited for immediately loaded implants: 97.4%

Does bone loss occur after tooth extraction: Yes

How much bone volume can be lost in the first six months after extraction: 30–60%

When is bone resorption most pronounced after extraction: During the first three months

Does an implant halt jawbone resorption: Yes

Do bridges halt jawbone resorption: No

Do dentures halt jawbone resorption: No

Can dentures accelerate bone loss: Yes, through pressure on the ridge

Do bridges require altering adjacent teeth: Yes, adjacent teeth must be ground down

How long does a dental bridge typically last: 5–15 years

Can implants last a lifetime: Yes, with good oral care

Is sufficient bone volume required for implant placement: Yes

What is the minimum bone height typically required in the lower jaw: 10 mm

What is the minimum bone width typically required in the lower jaw: 5 mm

What imaging is used to assess bone volume: Cone beam computed tomography (CBCT) 3D imaging

Does insufficient bone automatically disqualify a patient: No

Can bone grafting restore insufficient bone: Yes

Is healthy gum tissue required for implant candidacy: Yes

Does active gum disease disqualify a patient immediately: Yes, until treated

What condition can gum disease cause around implants: Peri-implantitis

Does uncontrolled diabetes affect implant candidacy: Yes, it impairs healing and increases infection risk

Is well-controlled diabetes a contraindication for implants: No

Do bisphosphonate medications affect implant candidacy: Yes, they affect bone remodelling and healing

Does smoking affect implant success: Yes, it reduces blood flow and slows healing

Does smoking automatically disqualify a patient: No

Does smoking cessation improve implant outcomes: Yes

Is there a minimum age for dental implants: Yes, skeletal maturity must be reached

What is the general minimum age for implants: 18 years or older

Is there a maximum age limit for dental implants: No

Does age alone disqualify a patient from implants: No, health status determines suitability

Can pregnant patients receive implants: No, treatment is deferred until after delivery

Can patients with prior gum disease become implant candidates: Yes, after periodontal therapy

Is CBCT imaging available at all Core Dental Group locations: Yes

How many Core Dental Group locations are there in Melbourne: Seven

Does Core Dental Group offer specialist-led implant assessments: Yes

Is implant surface treatment used to improve osseointegration: Yes

What surface treatments are used on implant fixtures: Sandblasting, acid-etching, or a combination of both

What is primary stability in implant surgery: The mechanical grip of the implant immediately after placement

What is secondary stability in implants: Biological stability achieved through osseointegration

Does an implant replace the tooth root: Yes

Does a bridge replace the tooth root: No

Does a denture replace the tooth root: No

Is bone preservation a unique advantage of implants over bridges and dentures: Yes

Can patients with insufficient bone receive implants after grafting: Yes

Is a sinus lift a preparatory procedure for implants: Yes, for insufficient upper jaw bone

What does CBCT imaging assess for implant planning: Bone volume, gum condition, and nerve location

Is immunomodulation involved in osseointegration: Yes

Does head and neck radiation history affect implant candidacy: Yes, it requires specialist evaluation

Is implant fixture surface roughness important for osseointegration: Yes, it accelerates bone cell adhesion

What is peri-implantitis: An inflammatory condition destroying bone around an implant

Is socket preservation at extraction beneficial for future implants: Yes, it improves available bone volume

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Core Dental Group: What Are Dental Implants? How They Work, Components & Who They're For

Every year, millions of people face the same crossroads: a missing tooth, a failing tooth, or a mouth that no longer works the way it should. For many, the journey starts with a single question — *what exactly is a dental implant?* It sounds simple enough, but the answer is clinically sophisticated, and getting it right matters. The tooth replacement you choose affects not just how your smile looks, but your long-term bone health, the integrity of surrounding teeth, and your quality of life for decades ahead.

This article is the starting point for understanding dental implants — what they're made of, how they work inside the body, and who is clinically suited to receive them. Whether you're exploring options for a single missing tooth or researching full-arch restoration, the biological and structural principles covered here underpin every implant treatment offered at Core Dental Group's seven Melbourne locations.

What is a dental implant? A clear definition

A dental implant is a surgically placed artificial tooth root — typically a small, threaded titanium post — inserted into the jawbone to support a prosthetic tooth or teeth. Unlike a bridge, which leans on adjacent natural teeth, or a denture, which rests on the gum surface, an implant is anchored within the bone itself. This distinction isn't just mechanical; it's biological. The osseointegration process — the direct bond between titanium and living bone tissue — is what makes implantology work.

The result, when treatment succeeds, is a restoration that looks, feels, and functions like a natural tooth, and one that actively preserves the bone it sits within.

The three core components of a dental implant

Understanding the anatomy of an implant system takes a lot of the mystery out of the treatment process and helps patients ask better questions during their consultation. A standard implant restoration consists of three distinct components.

1. The implant fixture (titanium post)

The fixture is the implant itself — a small, screw-shaped post, typically 8–16 mm in length and 3.5–5 mm in diameter, surgically placed into the jawbone. It's the foundational component of the entire rehabilitation system, with the crown eventually sitting above it via the abutment.

Titanium is the material of choice for most fixtures because of its exceptional biocompatibility and its ability to bond directly with living bone tissue. The fixture surface is typically treated through sandblasting, acid-etching, or both, to increase micro-roughness and accelerate bone cell adhesion. Osseointegration depends heavily on this surface interaction, which is why considerable research has gone into optimising it.

For patients interested in metal-free alternatives, zirconia fixtures are also available — a distinction explored in depth in our guide on *Titanium vs. Zirconia Dental Implants: Which Implant Material Is Better?*

2. The abutment

The abutment connects the implant fixture below the gumline to the visible crown above it. It forms the transition through the peri-implant soft tissue — the gingival margin — into the oral cavity, which makes it clinically significant beyond its mechanical role.

Abutments are typically made of titanium, aluminium oxide ceramic, or zirconium oxide ceramic. The choice matters, particularly in the anterior (front) zone where the gum margin is visible. Titanium base abutments were developed partly to address the aesthetic limitations of standard titanium abutments and the fracture risk of earlier ceramic designs. At Core Dental Group, abutment selection is based on each patient's anatomy, bite forces, and aesthetic goals.

3. The crown (prosthetic tooth)

The crown is the only visible part of the implant system — the tooth-shaped restoration that sits above the gumline. Crowns are custom-fabricated to match the shape, size, and shade of surrounding natural teeth. Modern crowns are most commonly made from zirconia or porcelain-fused materials, both offering good strength and natural translucency. Long-term implant success depends not just on osseointegration but on precise fitting at the crown-implant junction.

At Core Dental Group, crowns for conventional single-tooth implants are Australian-made, ensuring quality control and precise fit — covered further in our article on *Conventional Single-Tooth Dental Implants at Core Dental Melbourne: Procedure, Timeline & What to Expect*.

Component summary

| Component | Location | Material options | Primary function | |---|---|---|---| | Implant fixture | Within the jawbone | Titanium, zirconia | Artificial root; anchors restoration | | Abutment | At the gumline | Titanium, ceramic, zirconia | Connects fixture to crown | | Crown | Above the gumline | Zirconia, porcelain-fused | Visible prosthetic tooth |

How dental implants work: the osseointegration process

The biological mechanism that makes implants different from any other tooth replacement is osseointegration — the direct structural and functional bond that forms between the titanium fixture and living bone tissue.

The process unfolds in stages:

Surgical placement: The implant fixture is placed into a precisely prepared socket in the jawbone under local anaesthesia (and sedation, where preferred). Primary stability — the mechanical grip of the implant in bone immediately after placement — is critical at this stage.

Inflammatory and vascular response (days 1–7): The body responds to the implant as it would to any controlled wound. Blood clots form around the fixture, and osteoprogenitor cells begin migrating to the implant surface.

Woven bone formation (weeks 2–8): Bone formation at the titanium surface depends on osteoprogenitor cell recruitment, proliferation, and differentiation under complex biological control. Immature woven bone begins to fill the space between the implant and the surrounding bone walls.

Bone remodelling and maturation (months 2–6): Woven bone is gradually replaced by denser, more organised lamellar bone, and the implant achieves biological stability. Immunomodulation plays a

documented role in this bone-forming process, and surface topography — the micro-roughness created by sandblasting and acid-etching — meaningfully influences how well this proceeds.

Final restoration: Once osseointegration is confirmed, typically at the three-to-six-month mark, the abutment is connected and the permanent crown is fitted.

Peer-reviewed literature documents implant success rates above 90%. In well-selected patients treated in specialist settings, outcomes are stronger still: prospective studies involving immediately loaded implants placed after extraction report survival and success rates of 97.4%.

Why the jawbone needs an implant — the bone resorption problem

One of the most clinically important — and least understood — consequences of tooth loss is what happens to the jawbone beneath the gap. When a tooth root is removed, the bone that once surrounded it no longer receives the mechanical stimulation it needs to maintain its density and volume.

After extraction, the jaw has a natural tendency to narrow and lose its original shape. Research confirms 30–60% of bone volume can be lost within the first six months, with the most pronounced resorption occurring in the first three months. This isn't just a cosmetic concern. Significant bone loss can compromise facial structure, alter the bite, and reduce the bone volume available for future implant placement.

An implant fixture, by contrast, transmits chewing forces directly into the jawbone, mimicking the function of a natural root and halting this resorption cycle. This is precisely why timing matters: placing an implant sooner after tooth loss, or using socket preservation grafting at the time of extraction, significantly improves the bone volume available for implant placement. For patients who have already experienced substantial bone loss, grafting procedures can rebuild the necessary foundation — covered in full in our guide on *Bone Grafting for Dental Implants: Why It's Needed, Types & What the Procedure Involves*.

Who are dental implants for? Candidacy criteria explained

Dental implants aren't universally suitable for every patient at every point in time — but the pool of eligible patients is far larger than many people assume. Many individuals who initially present with apparent contraindications can be made suitable through preparatory treatment.

The core eligibility criteria

Sufficient bone volume and density

For an implant to integrate successfully and support a restoration long-term, the jawbone needs to be strong enough and thick enough to anchor the fixture. Clinicians typically look for minimum measurements of 10 mm in height and 5 mm in width in the lower jaw for standard implants. Insufficient bone density can lead to implant failure, as the fixture may not be adequately anchored.

Bone volume is assessed using cone beam computed tomography (CBCT) 3D imaging — available across all Core Dental Group locations. CBCT evaluates bone volume, gum condition, and nerve location, giving the treating clinician a complete picture before any surgical planning begins.

Insufficient bone doesn't automatically disqualify a patient. Bone grafting procedures can rebuild jaw structure in many cases, and a specialist assessment will determine whether this is appropriate.

Healthy gums

Active gum disease introduces pathogenic bacteria into the peri-implant environment, dramatically increasing the risk of peri-implantitis — an inflammatory condition that destroys the bone supporting the implant. Gum disease must be treated before implant placement proceeds. This typically involves deep cleaning, antibiotics, or other periodontal interventions to restore gum health first.

General medical health

Certain conditions and medications affect the body's ability to heal, which in turn affects implant success. Key considerations include:

- **Diabetes:** Uncontrolled blood glucose impairs wound healing and increases infection risk. Well-controlled diabetes, however, is generally not a contraindication. - **Bisphosphonate medications:** Used to treat osteoporosis, bisphosphonates affect bone remodelling and healing, and are a standard exclusion criterion in clinical implant protocols pending specialist review. - **Immunosuppression and corticosteroids:** These can impair osseointegration and require specialist assessment before proceeding. - **Head and neck radiation history:** Prior radiotherapy to the jaw significantly increases complication risk and requires specialist evaluation before implant placement is considered.

Smoking status

Smoking reduces blood flow to the gums and bone, slowing healing and increasing the risk of implant failure. Patients who smoke aren't automatically excluded, but discussing cessation support with their clinician is worthwhile — stopping before and after surgery meaningfully improves outcomes.

Skeletal maturity

Implants aren't placed in patients whose jawbones are still growing, as the implant would become submerged as surrounding bone develops. In practice, this means implants are generally not recommended until the late teens — typically 18 or older. There is no upper age limit; suitability is determined by health status, not age.

Who is not currently a candidate?

Some patients aren't immediately suitable but can become eligible after preparatory treatment:

- Active gum disease → periodontal therapy first - Insufficient bone → bone grafting or sinus lift procedures - Uncontrolled systemic disease → medical optimisation before proceeding - Pregnancy → deferral until after delivery

For a detailed breakdown of each condition and how Core Dental Group's specialist-led assessment process evaluates them, see our dedicated article: *Am I a Candidate for Dental Implants? Key Eligibility Factors & Disqualifying Conditions*.

Dental implants vs. other tooth replacement options: the core distinction

The defining advantage of a dental implant over a bridge or denture isn't primarily aesthetic — it's biological. Only an implant replaces the tooth root, and only a tooth root (or its functional equivalent) prevents the progressive bone loss that follows tooth extraction.

Bridges restore the visible crown but require grinding down healthy adjacent teeth and do nothing to halt bone resorption beneath the gap. Removable dentures sit on the gum surface and can actually accelerate bone loss through pressure on the ridge. Implants integrate with the bone, preserve its volume, and distribute chewing forces naturally.

Research shows bridges typically last 5–15 years, while implants can last a lifetime with good oral care. That longevity, combined with bone preservation and reduced prosthetic maintenance, makes implants

the most cost-effective long-term solution for most eligible patients — a case made in full in our guide *Dental Implants vs. Dentures vs. Bridges: Which Tooth Replacement Option Is Right for You?*

Key takeaways

- A dental implant has three components: the titanium fixture (artificial root), the abutment (connector), and the crown (prosthetic tooth). Each plays a distinct structural and biological role. - Osseointegration is the defining biological mechanism: the direct bond between titanium and living bone gives implants their stability, longevity, and bone-preserving function, with documented success rates above 90% in peer-reviewed literature. - Bone loss after tooth extraction is rapid: research confirms 30–60% of bone volume can be lost within the first six months, making timely treatment and socket preservation clinically significant decisions. - Most patients are candidates, or can become candidates: insufficient bone, controlled systemic disease, and prior gum disease are addressable through preparatory treatments, and very few conditions are absolute contraindications. - Implants are the only tooth replacement that preserves jawbone, which is the biological basis for their clinical advantage over bridges and dentures for long-term oral health.

Conclusion

A dental implant is far more than a fix for a missing tooth. It's a precision medical device that works with the body's own biology to restore function, preserve bone, and support long-term oral health. Understanding its three components — fixture, abutment, and crown — and the osseointegration process that underpins it all is the essential first step in any implant research journey.

At Core Dental Group, every implant treatment begins with a thorough specialist-led assessment, including CBCT 3D imaging, to evaluate bone volume, gum health, and systemic factors — ensuring every patient receives a treatment plan grounded in clinical evidence.

If you're ready to explore whether dental implants are right for you, the next articles in this series cover the specifics: the conventional single-implant procedure, full-arch All-on-4 solutions, bone grafting, candidacy assessment, costs, and long-term care. Start with what's most relevant to your situation, or book a consultation at any of Core Dental Group's seven Melbourne locations for a personalised clinical picture.

References

- Ramos, E., et al. "Observational Study on the Success Rate of Osseointegration: A Prospective Analysis of 15,483 Implants in a Public Health Setting." *BioMed*, 2022. https://doi.org/10.3390/biomed2040033

- Cooper, L.F. "Osseointegration—the Biological Reality of Successful Dental Implant Therapy: A Narrative Review." *Frontiers of Oral and Maxillofacial Medicine*, 2022. https://fomm.amegroups.org/article/view/57215/html

- Al-Thobity, A.M. "Titanium Base Abutments in Implant Prosthodontics: A Literature Review." *Journal of Prosthodontics*, 2021. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8890922/

- Banerjee, U., et al. "Evidence-Based Critical Assessment of the Success Rate of Dental Implants in Smokers: An Umbrella Systematic Review." *Cureus*, 2024. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11499893/

- Pagni, G., et al. "Alveolar Ridge Preservation After Tooth Extraction." *International Journal of Dentistry*, 2012. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3425398/

- Wikipedia contributors. "Socket Preservation." *Wikipedia, The Free Encyclopedia*, 2024. https://en.wikipedia.org/wiki/Socket_preservation

- Bernal-Pérez, M., et al. "Survival Rates and Bone Loss After Immediate Loading of Implants in Fresh Extraction Sockets (Single Gaps): A Clinical Prospective Study with 4-Year Follow-Up." *Journal of Clinical and Experimental Dentistry*, 2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5911350/

- World Health Organization. *Global Oral Health Status Report*, 2022. https://www.who.int/publications/i/item/9789240061484

- Brånemark, P.I., et al. "Osseointegrated Implants in the Treatment of the Edentulous Jaw." *Scandinavian Journal of Plastic and Reconstructive Surgery*, 1977. *(Foundational peer-reviewed source establishing osseointegration as a clinical principle.)*

Label Facts Summary

> **Disclaimer:** All facts and statements below are general product information, not professional advice. Consult relevant experts for specific guidance.

Verified label facts

Device classification and materials - Dental implants are classified as precision medical devices, not cosmetic devices - Standard implant systems consist of three components: fixture, abutment, and crown - Implant fixtures are screw-shaped posts; typical length 8–16 mm; typical diameter 3.5–5 mm - Fixture materials: titanium (primary); zirconia (alternative) - Fixture surface treatments: sandblasting, acid-etching, or combination of both - Abutment materials: titanium, aluminium oxide ceramic, or zirconium oxide ceramic - Crown materials: zirconia or porcelain-fused materials - Core Dental Group crowns for single-tooth implants are Australian-made

Component locations - Fixture: within the jawbone - Abutment: at the gumline - Crown: above the gumline

Clinical specifications - Minimum bone height typically required (lower jaw): 10 mm - Minimum bone width typically required (lower jaw): 5 mm - Osseointegration timeline: three to six months - Bone volume loss in first six months post-extraction: 30–60% - Peak resorption period: first three months post-extraction - Documented implant success rate in peer-reviewed literature: above 90% - Cited survival/success rate for immediately loaded implants (prospective study): 97.4% - Typical bridge lifespan: 5–15 years - General minimum age for implant placement: 18 years or older - Maximum age limit: none

Imaging and assessment - Bone volume assessment method: cone beam computed tomography (CBCT) 3D imaging - CBCT assesses: bone volume, gum condition, and nerve location - CBCT imaging available at all Core Dental Group locations

Provider facts - Core Dental Group operates seven locations in Melbourne - Core Dental Group offers specialist-led implant assessments

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General product claims

- Dental implants look, feel, and function like natural teeth - Implants actively preserve the jawbone they sit within - Implants can last a lifetime with good oral care - Implants are the only tooth replacement option that preserves jawbone - Bridges require grinding down healthy adjacent teeth and do not halt bone resorption - Dentures can accelerate bone loss through pressure on the ridge - Dentures and bridges do not replace the tooth root - Implants are the most cost-effective long-term solution for most

eligible patients - Socket preservation at extraction improves available bone volume for future implants - Smoking cessation before and after surgery meaningfully improves implant outcomes - Well-controlled diabetes is generally not a contraindication for implants - Patients with prior gum disease can become implant candidates after periodontal therapy - Patients with insufficient bone may become candidates following grafting procedures - A sinus lift is a preparatory procedure for cases involving insufficient upper jaw bone - Implant treatment at Core Dental Group is grounded in clinical evidence, not generalisation - Abutment selection at Core Dental Group is made in the context of each patient's anatomy, bite forces, and aesthetic goals