

Glossary

of Implant Dentistry

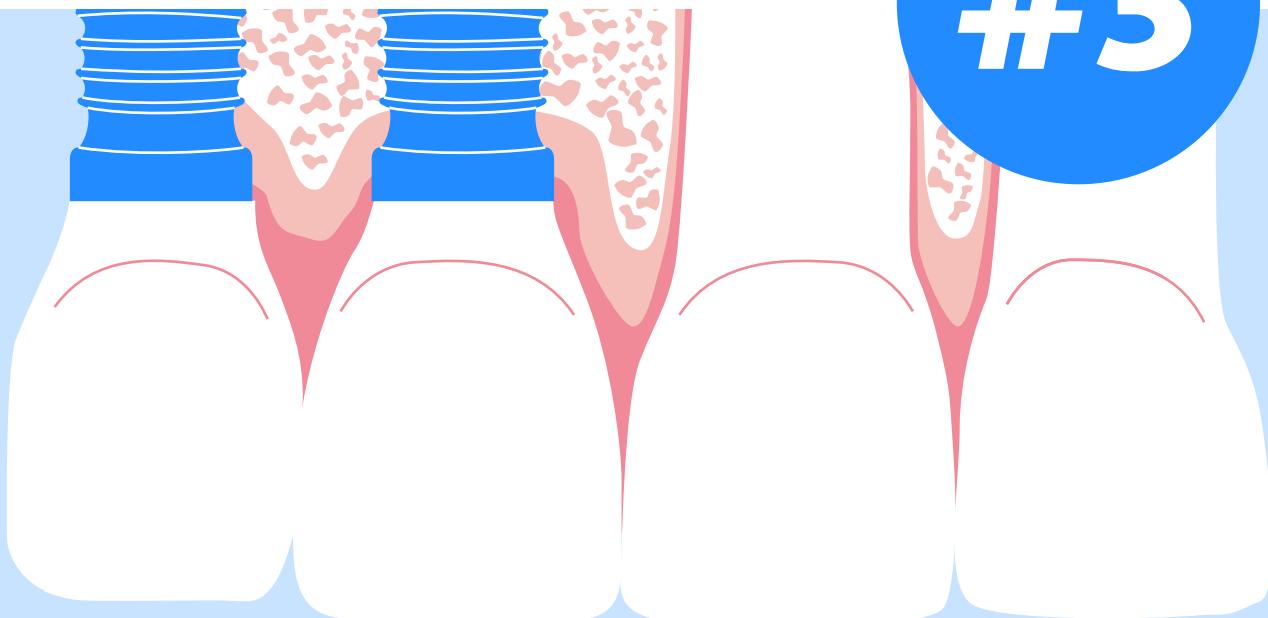


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Authorship:
Edited by several doctors and university departments.
ICOI's glossary will be under constant revision.

Introduction

What you are now engaged in is ICOI's new digital implant glossary. Technically this is our third glossary and, in a sense, our final one. Glossary III has been designed as a living document in digital format, wherein changes and additions will be seamlessly added for years to come.

Suggestions simply have to be submitted to our Glossary Committee at ICOI@dentalimplants.com.

Also included is an alphabetized index and a currently suggested list of references.

The Glossary Committee will meet periodically to review submissions and updates will be made.

Most importantly this glossary and updates are provided to all ICOI members and others at no charge.

Explanatory Notes

Entries

Main entries are listed in boldface, by alphabetical order, letter by letter, without regard to intervening hyphens or spaces.

Definitions

When a term has multiple meanings, the ordering of senses within an entry is alphabetic.

Abbreviations

Abbr Abbreviation; Introduces the expansion of the abbreviation.

Acronym Introduces the expansion of the acronym. e.g. Exempli Gratia; For example. i.e. Id Est; That is.

Obj See Objectionable; Some terms are confusing or improperly used. The reader is directed to the proper terminology which has the same connotation.

See Directs the reader to the synonymous term where the definition is presented, to related terms, and/or to appendices.

Sugg Suggested; When a term raised considerable objections among reviewers, the standard definition was listed. Alternative terms are suggested.

Symbol Introduces the expansion of the chemical symbol.

Syn Synonym; Synonyms are listed under the preferred term.

Interactive Elements

Underlined Hyperlink; Click the underlined terms will refer you to the related terms.



Visual Media; Click the sign will refer you to the PDF, Illustration or video.

Alphabetic Listing of Terms

A

3-D printing

See: Three-dimensional printing



3-D rendering

The process of converting digital information such as from a CBCT scan using modern 3D computer graphics processing into photorealistic images that can be visualized and manipulated on the computer screen.

*See: 3-D volume,
3-D volumetric reconstruction*

3-D scanner

Device that analyses a real-world object to collect data on its shape and or other attributes such as color or texture, and transforms this data into a digital format that can be used with computer software for exportation to 3-D printing or CAD CAM applications.

3-D volume

See: Three-dimensional volume rendering, Computed axial tomography (CAT), Cone-beam

computed tomography (CBCT)

which can be visualized and manipulated on the computer screen using specific software.

See: Voxel, 3-D rendering

3-D volumetric reconstruction

See: Three-dimensional volumetric reconstruction, Computed axial tomography (CAT), Cone-beam computed tomography (CBCT), which can be visualized and manipulated on the computer screen using specific software.

*See: Voxel,
3-D rendering, 3-D volume*

Absorbable

See: Bioabsorbable.

Abutment

The portion of a dental implant or a dental implant component that serves to support and/or retain a prosthesis. It may consist of one or more pieces.

See: Anatomic healing abutment, Angulated abutment, Castable abutment, Custom abutment, Healing abutment, Multi-unit abutment, Nonangled abutment, Prefabricated abutment, Preapable abutment, Temporary abutment, Transmucosal abutment, University of California at Los Angeles abutment (UCLA abutment), Zirconia abutment.

Abutment analog

A replica of an abutment usually incorporated within a cast for the fabrication of a prosthesis.

*See: Analog/anologue,
Implant analog.*

Abutment clamp

Forceps which usually engage the component circumferentially used to assist in the positioning and seating of an abutment on a dental implant platform.

Abutment connection

1. The act of fastening an abutment to a dental implant.
2. The interlocking, interfacial geometry between a dental implant and an abutment.

See: External connection, External hexagon, Internal connection, Internal hexagon, Morse taper connection.

Abutment driver

Instrument or device used to assist in the delivery and tightening of an abutment to a dental implant.

Abutment holder

Instrument that provides abutment retention for extraoral preparation and polishing procedures.

Abutment impression coping

See: Impression coping.

Abutment-implant interface

The coronal surface area of contact between the implant body and the implant abutment

Abutment-level impression

The impression of an abutment either directly using conventional impression techniques, or indirectly using an abutment impression coping.

See: Implant-level impression.

Abutment mount

Prefabricated device, usually packaged with an abutment, used for the transfer of an abutment to a dental implant intraorally.

Abutment Rotation

The amount that an abutment can rotate when connected to a dental implant which can lead to prosthesis misfit. It has been shown that the marginal gaps

between the abutment and the superstructure increased with the rotational freedom.

Abutment screw

A threaded fastener used to connect an abutment to a dental implant. It is usually torqued to a final seating position.

Abutment selection

A step in the prosthodontic treatment whereby a decision is made regarding the type of abutment to be used for the restoration based on dental implant angulation, interarch space, soft tissue (mucosal) height, planned prosthesis, occlusal factors (e.g., opposing dentition, parafunction), esthetics, and phonetic considerations.

Abutment swapping

See: Platform switching.

Abutment transfer device

See: Orientation jig.

Access hole

The channel in a screw-retained implant prosthesis giving access to the abutment or prosthetic screw, usually through the occlusal or lingual surface of the prosthesis.

Accessory ostium

Occasional opening of the maxillary sinus either into the infundibulum or directly in the wall of the middle meatus.

See: Ostium (maxillary sinus).

Acellular

Devoid of cells.

Acellular dermal allograft

Allogenic skin graft, derived from a human cadaver consisting of a thin split-thickness of dermis, devoid of cellular content following a tissue preparation process.

Acellular dermal matrix graft (ADM)

See: Acellular dermal allograft

Acetaminophen

Amide of acetic acid and p-aminophenol, a nonopioid analgesic and antipyretic drug, which may be administered orally or rectally.

Acid-etched surface

Treatment of a surface with an acid in order to increase its surface area by subtraction. For a dental implant, modifying the surface has the intention of enhancing bone-to-implant contact, enhancing osseointegration.

See: Subtractive surface treatment.

Activating tool

Instrument used to increase or reduce the retention of an attachment.

See: Attachment.

Actual implant length/diameter

The exact measurement of the length and diameter of a dental implant.

See: Nominal implant length/diameter.

Added surface

See: Additive surface treatment.

Additive fabrication

See: Solid freeform fabrication (SFF).

Additive Manufacturing (AM)

Defined by ASTM (American Society for Testing and Materials) as the “process of joining materials to make objects from STL files and 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies, such as traditional machining. The term AM encompasses many technologies including subsets like 3D Printing, Rapid Prototyping (RP), Direct Digital

Manufacturing (DDM), layered manufacturing and additive fabrication.

See: Rapid prototyping, 3-D printing

Additive Manufacturing File (AMF)

Data format proposed for additive manufacturing by the American Society of Testing and Materials (ASTM). This file will describe the shape and composition of any 3D object to be fabricated on any 3D printer. Unlike its predecessor STL format, AMF has native support for color, materials, lattices, texture, and constellations.

Additive surface treatment

Syn: Added surface.

Alteration of the surface of a dental implant by addition of material.

Aesthetic Buccal Flap (ABF)

See: Esthetic Buccal Flap (EBF)

Ailing implant

General term for a dental implant affected by peri-implant mucositis, without bone loss. For some authors, an ailing dental implant is an implant with a history of bone loss that is not progressing.

Sugg: Peri-implant mucositis, Peri-implantitis.

Alendronate sodium

Oral nitrogen-containing bisphosphonate used for the treatment of osteoporosis. It acts as a specific inhibitor of osteoclast-mediated bone resorption.

See: Bisphosphonate (BP).

Allogenic graft

See: Allograft.

Allograft

Syn: Allogenic graft.

Graft tissue from genetically dissimilar members of the same species. Four types exist: frozen, freeze-dried bone allograft (FDBA), demineralized freeze-

dried bone allograft (DFDBA), and solvent-dehydrated mineralized allograft. Allograft bone is processed and prepared by tissue banks.

See: Homograft.

“All-On-4”

The All-on-4 treatment concept is a technique for total rehabilitation of the edentulous patient or for patients with badly broken down teeth, decayed teeth or compromised teeth due to periodontal disease, placing four implants in either arch where the distal-most implants are placed in a tilted position to increase support for a fixed prosthesis usually-placed immediately on the day of surgery. All-on-4 is a registered trademark of Nobel Biocare.

**Alloplast**

Syn: Alloplastic graft.

Synthetic, inorganic material used as a bone substitute or as an implant (*See: Implant*).

Alloplastic graft*See: Alloplast.***Aluminum oxide**

A metallic oxide.

1. Alpha single crystal: An inert, highly biocompatible, strong ceramic material from which some dental implants are fabricated.
2. Polycrystal: Constituent of dental porcelain used to increase viscosity and strength.

Alveolar

Pertaining to an alveolus.

*See: Alveolus.***Alveolar augmentation***See: Augmentation.***Alveolar bone**

That part of the maxilla or mandible comprising the tooth-bearing and/or supporting part of the jaw bones.

*See: Bone.***Alveolar bone proper**

The bone lining the alveoli. Also called cribriform plate due to the numerous perforating channels (Volkmann's canals), lamina dura due to the radiographic appearance, fibrous endosteum due to the fibers of the periodontal ligament, bundle bone due the large quantity of Sharpey's fibers.

*See: Buccal plate, Lingual plate.***Alveolar crest**

The most coronal portion of the alveolar process.

Alveolar defect

A deficiency in the contour of the alveolar ridge either in the vertical (apicocoronal) and/or horizontal (buccolingual, mesiodistal) direction.

Alveolar distraction osteogenesis*See: Distraction osteogenesis (DO).***Alveolar mucosa***Syn: Lining mucosa.*

The lining mucosa that covers the alveolar process apical to the mucogingival junction. It consists of a nonkeratinized epithelium lining a connective tissue that is loosely attached to the periosteum and is movable.

*See: Oral mucosa.***Alveolar nerve***See: Anterior superior alveolar nerve, Inferior alveolar nerve (IAN), Middle superior alveolar nerve, Posterior superior alveolar nerve.***Alveolar preservation***See: Ridge preservation.***Alveolar process**

The compact and cancellous portion of bone surrounding and supporting the teeth.

*See: Alveolar ridge, Residual ridge, Ridge.***Alveolar recess**

A cavity in the maxillary sinus floor formed by a septum.

*See: Maxillary sinus septum.***Alveolar ridge**

The bony ridge of the maxilla or mandible that contains the alveoli.

*See: Alveolus, Residual ridge, Ridge.***Alveolar ridge augmentation***See: Augmentation.***Alveolar ridge defect***See: Alveolar defect, Ridge defect.***Alveolar ridge resorption***See: Ridge resorption.***Alveolar septum***See: Interalveolar septum.***Alveolectomy**

Removal of a portion of the alveolar process usually performed to achieve acceptable bone contour.

*See: Ostectomy.***Alveoplasty***See: Osteoplasty.***Alveolus***Syn: Socket.*

The bony socket in which a tooth is attached via the periodontal ligament.

Amoxicillin

Broad spectrum antibiotic, a semi-synthetic derivative of ampicillin, with a superior absorption and a bioavailability of 70 to 80 percent with very low toxicity. It is effective against gram-positive and gram-negative bacteria and may be combined with clavulanic acid to counteract the betalactamase destruction of penicillin by resistant bacteria.

It is the primary drug for antibiotic prophylaxis.

*See: Clavulanic acid.***Analgesia**

Absence of pain in response to stimulation that would normally be painful.

*See: Healing abutment.***Analgesic**

Medicine used to relieve pain. Two general categories exist: opioid and nonopioid.

Analog/analogue

Syn: Replica. A replica of an implant, abutment or attachment mechanism, usually incorporated within a cast for a prosthetic reconstruction.

Analysis of variance (ANOVA)

Test assessing the statistical significance of the differences among the obtained means of two or more random samples from a given population.

Anatomic healing abutment

Component secured on the prosthetic platform of a dental implant, with a three-dimensional design aimed at shaping the peri-implant soft tissue to a desirable emergence profile.

See: Healing abutment.

Anchor pin

Device used to stabilize a surgical or stereolithographic guide. It engages the underlying bone through a sleeve incorporated in the guide.

See: [Fixation pin](#), [Fixation screw](#), [Stabilization pin](#)

Anesthesia

Absence of all sensation.

See: [Dysesthesia](#), [Hyperesthesia](#), [Hypoesthesia](#), [Paresthesia](#).

Angiogenesis

Formation of new blood vessels.

See: [Vascularization](#).

Angiogenic

Which promotes or develops blood vessels, or promotes an increase in vascularization.

Angled abutment

See: [Angulated abutment](#).

Angulated abutment

Syn: [Angled abutment](#).

Abutment with a body not parallel with the long axis of the dental implant. It is used when the implant is at a different inclination in relation to the proposed prosthesis. Examples are implant manufacturers' stock angulated abutments ranging from 15°, 17°, 25°, and 30°.

See: [Nonangulated abutment](#), [Multi-unit abutment](#)

Anisotropic surface

Surface with a directional pattern.

See: [Isotropic surface](#).

Ankylosis

Dental ankylosis is characterized by the fusion of the tooth root to the bone, preventing both eruption and orthodontic movement. The periodontal ligament is obliterated by a 'bony bridge' and the tooth root is fused to the alveolar bone.

Anodization

Electrolytic passivation process used to increase the thickness of the natural oxide layer on the surface of a metal (e.g., titanium). During the process, a dye may be used to color a dental implant component to facilitate its recognition.

See: [Anodized surface](#).

Anodized surface

Treatment of a metal surface by the application of a voltage on a specimen (e.g., titanium) immersed in electrolytes (e.g., phosphorus, calcium, sulphur, or magnesium), in order to increase its oxide layer.

See: [Anodization](#).

Anodontia

Congenital absence of teeth.

Anorganic bone matrix (ABM)

Xenogenic or allogenic bone substitute derived from the mineral portion of bone and used for intraoral grafting procedures. By chemical and physical processes, sterilized osteoconductive deproteinized particles are obtained with a porosity, crystalline structure, and chemical composition similar to normal bone.

Anorganic bovine bone matrix (ABBM)

Xenogenic bone substitute derived from the mineral portion of bovine bone and used for intraoral grafting procedures. By chemical and physical processes, sterilized osteoconductive deproteinized particles are obtained with a porosity, crystalline structure, and chemical composition similar to normal bone.

Anterior loop

An extension of the inferior alveolar nerve, anterior to the mental foramen, prior to exiting the mandibular canal, via the mental foramen.

Anterior nasal spine

Triangular pointed projection at the anterior extremity of the intermaxillary suture. It may serve as a source of autogenous bone for intraoral grafting procedures.

Anterior superior alveolar nerve

Branch of the infraorbital nerve arising within the infraorbital canal. It initially runs laterally within the sinus wall and then curves medially to exit the infraorbital foramen. It supplies the maxillary anterior teeth.

Anteroposterior spread (AP spread)

Distance from the center of the most anterior dental implant to a line joining the distal aspects of the most distal dental implants. This measurement provides a guideline for the length of cantilever acceptable within the bilateral distal extensions of an implant-supported prosthesis.

Antibiotic

A natural, semisynthetic or synthetic antimicrobial agent used to prevent or treat infections caused by bacteria and other microorganisms.

See: [Antibiotic prophylaxis](#).

Antibiotic prophylaxis

Administration of an antibiotic prior to a surgical procedure (e.g., sinus graft) in order to prevent or reduce the incidence of postoperative infection. In patients with a risk of endocarditis, a standard protocol is recommended for certain dental procedures.

See: [Antibiotic](#).

Anti-inflammatory

The property of a substance or treatment that reduces inflammation.

See: Corticosteroid, Nonsteroidal anti-inflammatory drug (NSAID).

Antirotation

A feature or characteristic that prevents the rotation of two joint components.

Antral floor

See: Maxillary sinus floor.

Antral mucosa

See: Schneiderian membrane.

Antral polyp

Multilocular, pendulous, irregularly shaped edematous space usually associated with rhino-sinusitis.

Antral septum

See: Septum.

Antrolith

Calcified mass found in the maxillary sinus, resulting from the complete or partial encrustation of a foreign body (e.g., retained root).

Antroscope

An instrument for illuminating and examining the maxillary sinus.

Antroscopy

Inspection of an antrum using an antroscope.

Antrostomy

The surgical opening of an antrum for purposes of drainage or grafting.

See: Sinus graft.

Antrum

Based on Greek “antron” meaning “cave”, a cavity or chamber within bone.

See: Sinus.

Antrum of Highmore

See: Maxillary sinus.

Apical (retrograde) peri-implantitis

Obj See: Implant periapical lesion.

Apically positioned flap

A flap sutured in a direction apical to its original presurgical position.

See: Coronally positioned flap.

Articulator

An articulator is a mechanical device used to relate casts of the maxillary and mandibular arches, reproducing recorded positions of the mandible in relation to the maxilla. An articulator assists in the fabrication of fixed and removal prosthodontic restorations.

See: Virtual articulator

Artifact

Term used in medical/dental imaging to describe misrepresentation of tissue or bone structures seen in CT/CBCT images induced by discrepancies between the mathematical modeling and the

actual physical imaging process.

Since artefacts may interfere with the diagnostic process performed on CBCT data sets, every user should be aware of their presence.

See: Scatter, Beam hardening

Artificial gingival

Gingiva-colored “pink” restorative material used to replicate natural tissue.

See: Composites (Dental)

Asepsis

Prevention from contact with microorganisms.

Asleep

See: Sleeper implant.

Aspergillus

Fungus responsible for maxillary sinus fungal infections (aspergillosis).

Atraumatic extraction

The extraction of a tooth with minimal damage or injury to the surrounding hard and soft tissues.

Atrophic

Characterized by atrophy.

Atrophy

Decrease in size of a cell, organ, tissue or part.

See: Disuse atrophy, Ridge atrophy.

Attached gingiva

Part of the gingiva extending from the base of the sulcus to the mucogingival junction around teeth. It is “attached” to bone by the periosteum; to cementum by the gingival fibers; to cementum, enamel, or dentin by the epithelial attachment.

Attachment

A mechanical device for the fixation, retention and stabilization of a dental prosthesis. Consists of one or more parts, made of titanium, gold or plastic.

Attachment activating tool

See: Activating tool.

Attachment-retained

Use of a mechanical device for the retention of a prosthesis to an abutment or transmucosal portion of a one-part implant.

See: Attachment, Cement-retained, Friction-retained, Screw-retained.

Attachment selection

A step in the prosthodontic treatment whereby a decision is made regarding the type of attachment to be used in the prosthesis based on implant angulation, interarch space, soft tissue (mucosal) height, and amount of retention needed.

Augmentation

Any procedure meant to correct a soft or hard tissue deficiency.

See: Bone augmentation.

Auricular prosthesis

See: Ear prosthesis

Autogenous bone graft

Bone harvested from one site and transplanted to another site in the same individual.

B

Autogenous Demineralized Dentin Matrix (ADDM)

Dentin from non-endodontically treated teeth removed of all visible tissue debris are ground and treated to facilitate release of BMPs to induce differentiation of undifferentiated mesenchymal cells into osteogenic cells having the potential for stimulating bone formation. The resulting ADDM also provides a scaffold and space for the new bone formation.

See: Dentin grinder, Bone scaffold

Autogenous graft

Syn: Autograft, Autologous graft.
Tissue taken from one site and transplanted to another site in the same individual.

Autograft

See: Autogenous graft.

Autologous graft

See: Autogenous graft.

Available bone

Portion of an edentulous ridge that can be used for the placement of a dental implant.

Avascular

Lacking blood vessels.

Avascular necrosis

Cell death that occurs as a result of inadequate blood supply.

Axial loading

Refers to any force applied in the direction of the long axis of a dental implant.

See: Nonaxial loading.

Axial slice

A thin section from a computed tomography scan data (usually between 0.125 to 2.0 millimeters thick) transverse to the patient's length axis, ideally parallel to the plane of occlusion.

See: Cross-sectional slice, Panoramic reconstitution.

Axonotmesis

Nerve injury with loss of axonal continuity, but with maintenance of the myelin sheath. Sensory and/or motor functions are impaired. Recovery may occur after one to three months. It may be caused by a drill violating the mandibular canal, an anesthetic needle penetrating the nerve trunk, or excessive reflection.

See: Neurapraxia, Neurotmesis.

Azalide

New generation of macrolide derivatives with improved pharmacokinetic properties, tissue penetration, and activity against many gram-positive and gram-negative bacteria.

See: Azithromycin.

Azithromycin

An azalide antibiotic which inhibits bacterial protein synthesis, and is effective against a wide range of gram-positive, gram-negative, and anaerobic bacteria. It is used in the treatment of mild to

moderate infections caused by susceptible organisms, and may be administered orally and intravenously.

See: Azalide.

Bacterial leakage

Gaps which can exist between the implant body and the abutment which under the forces of mastication can lead to microbial leakage, and colonization of bacteria. This leakage may be a contributing factor for peri-implantitis.

See: Peri-implantitis, Abutment connection

Ball abutment

See: Ball attachment.

Ball attachment

Extracoronal type of attachment mechanism used to retain an overdenture, consisting of a spherical shaped abutment and a metal housing.

See: Metal housing.

Bar

Syn: Connecting bar.

A connector between two or more dental implants or teeth. It is used to provide retention, stability, and/or support to a prosthesis.

Barium sulfate (BaSO_4)

Finely ground radiopaque powder used as a marker in the construction of a radiographic template.

Bar overdenture (implant)

Removable partial or complete denture, which may be implant-supported or implant-tissue-supported. Implants in this type of reconstruction are connected together with a bar incorporating attachment mechanisms for retention and/or support of the prosthesis.

Barrier membrane

Syn: Occlusive membrane.
Device which helps confine a grafted area. It is meant to prevent migration of grafting material and/or prevent ingrowth of unwanted cells into a site.

Barrier membrane exposure

See: Exposure.

Basal bone*See: Bone.***Basic multicellular unit (BMU)**

Functional unit consisting of cellular elements responsible for bone formation and resorption (i.e., remodeling).

Basic structural unit (BSU)

The unit of bone tissue formed by one basic multicellular unit (BMU). It is also referred to as an osteon.

Beam hardening

Beam hardening is one of the most prominent sources of artifacts in CBCT imaging modalities. When there are dense objects within a CBCT scan, such as a dental implant embedded in bone, the type of energy from the object turns adjacent voxels black giving an appearance of radiolucency in the bone.

*See: Artifact, Voxel, Scatter***Bending stress**

Stress caused by a load that tends to bend an object.

*See: Compressive stress, Stress.***Benign paroxysmal positional vertigo (BPPV)**

Short, recurrent episodes of vertigo when carrying out certain lateralization and extension movements of the head. In implant dentistry, it may be a postoperative complication following a surgery in the maxilla where osteotomes were used.

Betamethasone

An oral, topical, and inhaled glucocorticoid with a long half-life.

*See: Glucocorticoid.***Beveled flap**

Section of soft tissue outlined by a surgical incision made at an acute angle to the gingival or mucosal tissue.

Beveled incision

Cut made at an acute angle to the gingival or mucosal surface.

Bicortical stabilization

The engagement of a dental implant with the crestal cortical bone of the edentulous ridge and the cortical bone of the base of the mandible or the floor of the maxillary sinus or floor of the nasal cavity. It may also apply to the engagement of the facial and lingual cortices.

Bilateral stabilization*See: Cross-arch stabilization.***Bioabsorbable***Syn: Absorbable.*

Property of a material to degrade or dissolve in vivo. Breakdown products are incorporated into normal physiologic and biochemical processes (e.g., bioabsorbable membranes or sutures).

Bioactive

Having an effect on, or eliciting a response from, living tissue.

*See: Bioinert.***Bioactive fixation**

Stabilization involving direct physical and/or chemical attachment mechanism(s) between biological tissues and a dental implant surface at the ultra-structural level.

Bioactive glass

Absorbable alloplastic material composed of metal oxides: SiO_2 , Na_2O , and P_2O_5 . It has the ability to form a chemical bond with living tissues thereby helping stabilize a filled defect site and maintaining a rigid scaffold upon which cells can migrate and grow.

Bioceramics

Specially designed and fabricated ceramics for the repair or reconstruction of diseased, damaged, or missing parts of the body.

Biocompatible

Property of a material to elicit or perform without a negative host response (immune response or inflammation) in a specific application. In general, biocompatibility is measured on the basis of allergenicity, carcinogenicity, localized cytotoxicity, and systemic response.

Biodegradable

Property of a material to degrade when placed in a biologic environment.

*See: Bioabsorbable.***Bioinert**

Property of a material that elicits no host response.

*See: Bioactive.***Biointegration**

The bonding of living tissue to the surface of a biomaterial or implant, independent of any mechanical interlocking mechanism. It is often used to describe

the bond to hydroxyapatite-coated dental implants.

*See: Osseointegration.***Biologic width**

The combined apicocoronal height of connective tissue and epithelial attachment. It exists around teeth as well as around dental implants once exposed to the oral cavity.

**Biomaterial**

Material used to replace part of a living system or to function in contact with a living system.

Biomechanical test

A test that measures the physical properties of any biomechanical device, device-tissue interface (e.g., bone-implant), or the properties of tissues themselves.

Biomechanics

Scientific field that deals with the mechanical properties of biologic structures as well as the interaction between mechanical devices and living tissues, organs, and organisms.

Biomimetic

The study of the structure and function of biologic systems as models for the design and engineering of materials and machines. To replicate or imitate a body structure (anatomy) and/or function (physiology).

Bioresorbable

See: Resorbable.

Biphasic calcium phosphate (BCP)

Alloplastic bone substitute consisting of 60% hydroxyapatite and 40% beta-tricalcium phosphate used in intraoral grafting procedures. The granules are 90% porous and with interconnected pores of 100 to 500 microns.

See: Calcium phosphate, Tricalcium phosphate (TCP).

Bisphosphonate (BP)

Syn: Diphosphonate.

Group of drugs used to manage osteoporosis and Paget's disease, or to treat

hypercalcemia of malignancy or metastatic bone lesions. Its mechanism of action involves the suppression of osteoclasts thereby reducing bone resorption. Two main groups exist: nitrogen containing and non-nitrogen containing, with subgroups of either oral or intravenous administration.

See: Bisphosphonate-related osteonecrosis of the jaw (BRONJ).

Bisphosphonate-associated osteonecrosis (BON)

See: Bisphosphonate-related osteonecrosis of the jaw (BRONJ).

Bisphosphonate-induced osteonecrosis of the jaw (BION)

See: Bisphosphonate-related osteonecrosis of the jaw (BRONJ).

Bisphosphonate-related osteonecrosis of the jaw (BRONJ)

A complication characterized by exposed necrotic bone in the maxillofacial region that does not heal within eight weeks after diagnosis and proper care, in a patient under current or previous bisphosphonate treatment and who has not received radiation in the head and neck area.

Risk factors include route of administration (intravenous versus oral), duration of therapy, and type of bisphosphonate (nitrogen containing or not).

See: Bisphosphonate (BP).

Bite splint

See: Occlusal guard.

Black space

See: Black triangle.

Black triangle

Syn: Black space.

Condition when a void is present in the interproximal space apical to the contact point.

Blade implant

A laminar endosseous dental implant designed to be placed within bone.

**Blanching**

To make or become white or pale, usually in reference to peri-implant or periodontal soft tissues (e.g., during prosthetic try-in/ insertion).

Blasted implant surface

Treatment of a surface by grit blasting to increase its surface area by subtraction.

See: Subtractive surface treatment.

**Block graft**

Graft consisting of a monocortical piece of autogenous bone (e.g., chin or ramus), or a piece of bone replacement graft, usually stabilized in the recipient site with screws.

Bone

The mineralized connective tissue that constitutes the majority of the skeleton. It consists of an inorganic component (67%) (minerals such as calcium phosphate) and an organic component (33%) (collagenous matrix and cells).

1. Alveolar bone: Bony portion of the mandible or maxilla in which the roots of the teeth are held by periodontal ligament fibers. Alveolar bone is formed during tooth development and eruption.

2. Basal bone: Bone of the mandible or maxilla, excluding the alveolar bone.

3. Bundle bone: Type of alveolar bone, so-called because of the continuation into it of the principal (Sharpey's) fibers of the periodontal ligament.

4. Cancellous bone: (*Syn: Medullary bone, Spongy bone, Trabecular bone*) Bone in which the trabeculae form a three-dimensional latticework with the interstices filled with bone marrow.

5. Cortical bone: (*Syn: Compact bone*) The noncancellous hard and dense portion of bone consisting largely of concentric lamellar osteons and interstitial lamellae.

6. Lamellar bone: Mature bone, organized in layers (lamellae) that may be concentrically arranged (compact bone) or parallel (cancellous bone).

7. Woven bone: *Syn: Nonlamellar bone, Primary bone, Primitive bone, Reactive bone.* Immature bone encountered where bone is actively healing or being regenerated.

Bone-anchored hearing aid (BAHA)

A surgically implanted abutment to transmit sound by direct conduction through bone to the inner ear, bypassing the external auditory canal and middle ear.

A titanium prosthesis is surgically embedded into the skull with a small abutment exposed outside the skin.

Bone atrophy

Decrease in the dimensions of bone due to resorption.

Bone augmentation

Placement of an autogenous graft and/or a bone replacement graft, or any procedure that corrects a hard tissue deficiency.

Bone biopsy

Bone sample harvested from an area of interest for analysis.

Bone collector

See: [Bone scraper](#), [Bone trap](#).

Bone condenser

See: [Osteotome](#).

Bone condensing

See: [Osteotome technique](#).

Bone conduction

See: [Osteoconduction](#).

Bone core

See: [Bone biopsy](#).

Bone curettage

Surgical shaving or smoothing of the bone surface.

Bone defect

See: [Alveolar defect](#), [Ridge defect](#).

Bone "density"

1. Clinical: Tactile assessment of bone quality reflecting the percentage of calcified bone to marrow, determined during osteotomy preparation. Usually classified from D1 (dense) to D4 (porous). Other classifications exist.

2. Histological: The "density" is calculated from the percentage of all bone tissue that is constituted by mineralized bone.

3. Radiographic: An estimate of the total amount of bone tissue (as bone mineral) in the path of one or more x-ray beams, as measured by Hounsfield units. When in quotes, "density" is as defined in absorptiometry, and does not mean density as used in physics.

Bone derivative

A substance extracted from bone, such as bone morphogenetic proteins.

Bone expander

See: [Osteotome](#).

Bone expansion

See: [Ridge expansion](#).

Bone fill

Clinical and/or radiological restoration of a hard tissue defect.

Bone fusing

See: [Osseointegration](#).

Bone graft

Syn: [Osseous graft](#).

Autogenous bone used for grafting.

Bone grafting

A surgical procedure performed to establish additional bone volume, using autogenous bone and/or a bone replacement graft, prior to or simultaneously with dental implant placement.

See: [Bone graft](#), [Bone replacement graft](#), [Bone substitute](#).

**Bone-implant interface**

Demarcation between the material surface (i.e., the dental implant) and the biological environment (i.e., bone).

Bone induction

See: [Osteoinduction](#).

Bone loss (implant)

Physiologic or pathologic bone resorption around a dental implant.

See: [Crestal bone loss](#), [Early crestal bone loss](#), [Implant periapical lesion](#), [Peri-implantitis](#).

Bone marrow

Non-mineralized tissue found within bone containing hematopoietic and/or fatty tissues.

Bone "mass"

The amount of bone tissue, often estimated by absorptiometry, preferably viewed as a volume minus the marrow cavity.

Bone "mass" measurement

See: [Bone mineral density \(BMD\)](#).

Bone matrix

The intercellular substance of bone consisting of collagenous fibers embedded in an amorphous ground substance and inorganic salts.

Bone mill

Device used to mechanically transform harvested autogenous bone into a suitable particle size, for grafting procedures.

Bone milling

A process used to particulate harvested bone into progressively smaller particles.

Bone mineral density (BMD)

Syn: [Bone "mass" measurement](#). The mineral content in a given volume of bone, used as a measure of bone health and in the diagnosis of osteoporosis.

Bone modeling

See: [Modeling \(bone\)](#).

Bone morphogenetic protein (BMP)

The (TGF β) superfamily of growth factors which may stimulate osteogenesis by differentiation of mesenchymal stem cells capable of inducing bone formation in normally non-osseous tissues. It is produced by osteoblasts and stored in bone. BMP-2, 4, and 7 are known to promote de novo bone formation through the process of osteoinduction.

See: [Osteoinduction](#)

C

Bone necrosis

See: Osteonecrosis.

Bone quality

A qualitative assessment of bone based on its density.

Bone reduction guide (bone reduction template)

A CT/CBCT-derived surgical guide used to assist in accurate reduction of excess bone in the mandible or maxilla to aid in the placement of dental implants, and to facilitate prosthesis design.

Bone remodeling

See: Remodeling (bone).

Bone remodeling rate (BRR)

The turnover or replacement of packets of bone tissue called basic multicellular units, or BMUs, in all or part of a bone structure without a change in shape.

Bone remodeling unit (BRU)

A group of osteoblasts and osteoclasts involved in bone remodeling.

See: Remodeling (bone).

Bone replacement graft

Any material other than autogenous bone, which is used as a hard tissue graft, in an attempt to stimulate new bone formation in an area where bone formerly existed.

Bone resorption

Loss of bone due to osteoclastic activity.

Bone scaffold

The three-dimensional structure created by bone or bone substitute, which maintains a volumetric space for cellular growth.

See: Scaffold.

Bone scraper

Device used to harvest bone particles through surface shavings for grafting purposes.

Bone sounding

See: Ridge sounding.

Bone spreader

See: Osteotome.

Bone substitute

Synthetic or natural materials for grafting purposes. They include hard tissue replacement polymers, natural coral, hydroxyapatite, tricalcium phosphate, and various other biomaterials. They may be incorporated into surrounding tissue or gradually replaced by original tissue.

Bone tap

See: Tap.

Bone-to-implant contact (BIC)

The direct contact of bone with the surface of an endosseous dental implant at the light microscopic level.

See: Percentage bone-to-implant contact.

Bone trap

Device attached to an evacuation system, used to collect autogenous bone debris, through a process of filtration. Particles harvested may be used for grafting purposes.

Bone trephine

See: Trephine.

Bone turnover

See: Turnover (bone).

Bruxism

Habit of involuntary grinding, clenching, or clamping the teeth. This generates forces that may damage teeth and/or implants.

Buccal index

An impression record of the facial aspect of teeth relative to a cast.

Buccal mucosal incision

See: Mucobuccal fold incision.

Buccal plate

Syn: Labial plate.

Bony wall at the buccal aspect of an alveolus consisting of alveolar bone proper, cortical bone, with or without intervening cancellous bone.

Bundle bone

A histologic term for the portion of the bone of the alveolar process that surrounds teeth and into which the collagen fibers of the periodontal ligament are embedded.

See: Alveolar bone proper, Bone.

Button implant

See: Mucosal insert.

CAD/CAM

Acronym: Computer-aided design/Computer-aided manufacturing (CAD/CAM).

**CAD/CAM dentistry**

Computer-Aided Design and Computer-Aided Manufacturing in dentistry, is an area of dentistry utilizing milling technologies to produce a variety of different dental restorations, including crowns, veneers, inlays and onlays, fixed bridges, dental implant restorations and orthodontic appliances, with a variety of different materials.

CAD/CAM abutment

Abutment which is totally designed and manufactured using computer software from information generated from a digital position recognition of the implant platform.

See: CAM abutment, Custom abutment.

Calcium carbonate (CaCO₃)

See: Coralline.

Calcium phosphate

Mineral needed for the mineralization of the new bone in a graft site. Its source is usually from the surrounding bone and may be also introduced through the blood supply. Class of ceramics with varying calcium-to-phosphorous ratios, which can form a direct bond with bone. It can also be used as a bone substitute.

See: [Alloplast](#), [Biphase calcium phosphate \(BCP\)](#), [Tricalcium phosphate \(TCP\)](#).

Calcium sulfate (CaSO_4)

Fully biodegradable ceramic alloplastic material used for intraoral grafting procedures. It also has barrier membrane properties and may be used as a carrier for the local delivery of antibiotics.

See: [Medical-grade calcium sulfate \(MGCS\)](#).

Caldwell-Luc

Surgical procedure named after American physician George Caldwell and French laryngologist Henry Luc. Its original indication was for the relief of chronic sinusitis by improving drainage of the maxillary sinus through an incision into the canine fossa.

Callus

The tissue that forms between and around fractured bone segments to maintain structural integrity and facilitate bone regeneration.

Calvaria

The domelike superior portion of the cranium, derived from the membranous neurocranium, and consisting of the frontal and parietal bones and the squamous parts of the occipital and temporal bones. Bone may be harvested from this site for grafting purposes.

Calvarial graft

Autogenous bone graft harvested from the domelike superior portion of the cranium, most frequently from the parietal region, generally on the right side (nondominant hemisphere) behind the coronal suture, and approximately three centimeters lateral to the sagittal suture.

Calvarium

Obj See: [Calvaria](#).

CAM abutment

Abutment which is designed by casting a waxed castable abutment, which is subsequently scanned, digitized, and fabricated through computer-aided manufacturing.

See: [CAD/CAM abutment](#), [Castable abutment](#), [Custom abutment](#).

Cancellous bone

See: [Bone](#).

Cancellous bone graft

Graft consisting of medullary bone.

See: [Cortical bone graft](#), [Corticocancellous bone graft](#).

Cantilever

A prosthetic extension supported on one side.

**Cap attachment**

See: [Metal housing](#).

Case-control study

Study design used to identify factors that may contribute to a medical condition by comparing a group of patients who have that condition (experimental group) with a group of patients who do not (control group).

Case report

A type of documentation in which diagnosis, treatment, and outcome of a patient are described.

Case sequencing

The order of treatment for a patient undergoing dental implant therapy, including time of treatment as it relates to healing and prosthodontic restoration.

Case series

Analysis of a series of patients with a certain diagnosis and treatment of interest. There is no control group involved.

Castable abutment

Syn: [University of California at Los Angeles abutment \(UCLA abutment\)](#).

A prefabricated component, with or without a prefabricated cylinder, used to make a custom abutment for a cement-retained or screw-retained prosthesis, by waxing its plastic burnout pattern and subsequently casting the abutment through a lost-wax technique.

See: [Prefabricated cylinder](#).

Cement-retained

The use of dental cement for the retention of a prosthesis to an abutment, or transmucosal portion of a one-piece dental implant.

See: [Attachment-retained](#), [Screw-retained](#).

Ceramic

Alloplastic material used for bone grafting or to fabricate abutments and prostheses.

See: [Alloplast](#).

Cervix

See: [Implant neck](#).

Chin graft

A bone graft harvested from the facial aspect of the mandibular symphyseal area, between the mental foramina, apical to the roots of the teeth, and usually above the lower border of the mandible.

Chisel

An instrument with a beveled cutting edge used for cutting or cleaving hard tissue.

Chi-square test

A statistical method used to determine whether observed frequencies are significantly different from expected frequencies and whether there is a statistically significant difference.

Chlorhexidine gluconate

A bis-biguanide antimicrobial, used as an oral rinse or local antiseptic. Its mechanism of action involves the lysis of bacterial membranes.

Cicatrix

See: Scar.

Circumferential subperiosteal implant

See: Subperiosteal implant.

Clamping force

The result of the elastic deformation of a screw after application of torque drawing two components together.
See: Preload.

Clarithromycin

A semisynthetic macrolide antibiotic used in the treatment of orofacial infections caused by gram-positive cocci and susceptible anaerobes. Its mechanism of action involves the prevention of bacteria from growing by interfering with protein synthesis. Alternate drug used for antibiotic prophylaxis.

Clavulanic acid

A beta-lactamase inhibitor sometimes combined with penicillin group antibiotics to overcome certain types of antibiotic resistance.

See: Amoxicillin.

Clean technique

Surgical procedure that takes place in a clinic setting. All instruments, implants, grafts, and irrigation solution used are sterile. Surgeons wear sterile gloves, but hospital operating room level sterility is not achieved. The surgeons and assistants wear non-sterile attire and the patient is not necessarily covered by sterile drapes.
See: Sterile technique.

Clindamycin

Lincosamide antibiotic used in the treatment of orofacial infections caused by anaerobic bacteria. It is also active against aerobic bacteria, such as streptococci and staphylococci. Alternate drug used for antibiotic prophylaxis.

Clip

A retentive element within an overdenture used for its fixation to a bar.

See: Bar overdenture (implant).

Clipping Function

A software application to virtually slice through a 3D volumetric reconstruction derived from CT/CBCT data in various planes.

Closed-tray impression

Syn: Indirect impression.
Impression technique that uses an impression coping with positioning features, around which a rigid elastic impression material is injected. After removal of the impression, the coping is unthreaded from the mouth, connected to a laboratory analog and repositioned into the impression prior to pouring.
See: Open-tray impression.

Closure screw

See: Cover screw.

Cluster (implant) failure

The occurrence of multiple dental implant failures in one or a minute group of patients derived from a large pool of subjects.

CMOS device

Converts light into a digital signal using photosensitive pixels and on-chip circuitry used in CBCT scanners. CMOS technology has a limited photosensitive area and higher noise compared with a CCD. CMOS has several useful characteristics: It requires low power to operate, has high-speed readout, is capable of on-chip integration of electronic circuitry and produces digital signals without external converters.

CNC milling (CNC)

A specific form of computer numerical controlled (CNC) machining. Milling itself is a machining process similar to both drilling and cutting, and able to achieve many of the operations performed by cutting and drilling machines. Milling uses a rotating cylindrical cutting tool that can move along multiple axes, and can create a variety of shapes, slots and holes. In addition, the work-

piece is often moved across the milling tool in different directions, unlike the single axis motion of a drill.

Coagulum

A clot or a coagulated mass.

Coaptation

The approximation of the edges of a wound.

Coating

1. Abutment: Surface treatment for an abutment to alter its optical transmission characteristics.
2. Dental implant: A substance applied to all or a portion of the dental implant.

See: Additive surface treatment, Textured surface.

Cohort study

A longitudinal study in which a group, the cohort, is chosen for the presence of a specific characteristic at or during a specified time and followed over time to discover presumably related characteristics.

Collaborative accountability

Concept that captures the information from current CT/ CBCT imaging technology with interactive treatment planning software to communicate the diagnosis and treatment plan to all members of the implant team to ensure consistent surgical and restorative outcomes.

Collagen

A molecule characterized by a triple helical structure and a high content of glycine, proline and hydroxyproline. It is the major constituent of connective tissue fibers, the organic matrix of bone, dentin, cementum, and basal laminae. Collagen is synthesized by fibroblasts, chondroblasts, osteoblasts, and odontoblasts. Several types are found in the human body. Type 1 collagen is one of the first products synthesized by the body when bone formation occurs.

See: [Titanium \(Ti\)](#), [Titanium alloy \(Ti-6Al-4V\)](#).

Collagen membrane

Bioabsorbable barrier membrane made from collagen (mainly type 1) with the following properties: well tolerated by surrounding tissues, semi-permeable, hemostatic, and chemotactic.

Collar

See: [Implant collar](#).

Comfort cap

See: [Hygiene cap](#).

Commercially pure titanium (CP-Ti)

Biocompatible metal commonly used for dental implants. It is an alloy of approximately 99 wt.% titanium and small amounts (from 0.18 to 0.40 wt.%) of oxygen with trace amounts (less than 0.25 wt.%) of iron, carbon, hydrogen, and nitrogen. Commercially pure titanium is classified in multiple grades. The amount of oxygen determines the grade of the alloy.

See: [Titanium \(Ti\)](#), [Titanium alloy \(Ti-6Al-4V\)](#).

Compact bone

See: [Bone](#).

Compatible

Refers to the interchangeability of prosthetic components of one implant system to another.

Complete subperiosteal implant

See: [Subperiosteal implant](#).

Complication

An unfavorable condition, reversible or irreversible.

Composites (Dental)

Resins are types of synthetic materials which are used in dentistry as restorative material or adhesives. Synthetic resins evolved as restorative materials since they were insoluble, aesthetic, insensitive to dehydration, easy to manipulate and reasonably inexpensive. Composite resins are most commonly composed of Bis-GMA and other dimethacrylate

monomers (TEGMA, UDMA, HDDMA), a filler material such as silica and in most current applications, a photoinitiator. Dimethylglyoxime is also commonly added to achieve certain physical properties such as flow ability. Further tailoring of physical properties is achieved by formulating unique concentrations of each constituent. An example for use in dental implants incorporates a hybrid technique which involves a screw-retained partial implant bridge which provides white esthetics and a gingival base made of ceramic material, which can then be covered with a composite overlay to create the final pink contours making the prosthetic gingival restoration more esthetic and predictable.

See: [Artificial gingival](#).

Composite bone

Transitional state between woven and lamellar bone, in which a woven bone lattice filled with lamellar bone can be seen histologically.

Composite graft

Combination of different grafting materials.

implant dentistry parallel to the occlusal plane. It can be used for the treatment planning of dental implants with software-based planning.

See: [Computed tomography \(CT\)](#), [Cone-beam computed tomography \(CBCT\)](#), [Software-based planning](#).



Computed tomography (CT)

Imaging technique that uses a combination of x-rays and computer technology to generate a three-dimensional, panoramic, or cross-sectional image of a bodily structure. Two types of tomography are used in implant dentistry: axial and cone-beam.

See: [Computed axial tomography \(CAT\)](#), [Cone-beam computed tomography \(CBCT\)](#).

**Computer-aided design/
Computer-aided
manufacturing
(CAD/CAM)**

Process for direct preparation of an object from computer-acquired or computer-generated data.

Computer-aided navigation

Syn/See: [Navigation surgery](#).

Computer-assisted surgical guide

See: [Stereolithographic guide](#).

Computer-based planning

See: [Software-based planning](#).

Computer-generated surgical guide

See: [Rapid prototyping](#), [Stereolithography](#), [Stereolithographic guide](#), [Surgical guide](#), [Three-dimensional printing](#).

Computer Numeric Controlled Machining

See: [CNC milling \(CNC\)](#)

Confocal microscopy

Confocal microscopy is an optical imaging technique for increasing optical resolution and contrast of a micrograph by means of adding a spatial pinhole placed at the confocal plane of the lens to eliminate out-of-focus light. It enables the reconstruction of three-dimensional structures from the obtained images.

See: [Parallel confocal imaging technology](#)

Cone-beam computed tomography (CBCT)

Syn: [Helical cone-beam computed tomography](#), [Spiral cone-beam computed tomography](#).

Imaging technique that uses a cone-shaped x-ray beam to acquire multiple images of a patient. Images are captured on flat panel detectors or image intensifiers. Volume data can be acquired in a single rotation of the beam and the detector, at reduced radiation exposure. It can be used for precise diagnosis and treatment

planning of dental implants when used with interactive software applications.

See: [Computed tomography \(CT\)](#), [Cone-beam computed tomography \(CBCT\)](#), [Software-based planning](#).

Configuration

Specific size and shape of a dental implant or component.

Confirmation jig

See: [Verification jig](#).

Conical abutment

A transmucosal abutment used in the fabrication of a screw-retained prosthetic reconstruction.

Connecting bar

See: [Bar](#).

Connective tissue (CT)

A primary tissue with many different forms and functions, including support, storage, and protection. It is often recognized as distinct from other tissues due to its larger proportion of extracellular matrix.

Connective tissue attachment

The mechanism of attachment of the connective tissue to a tooth or a dental implant. Around the latter, the connective tissue fibers are generally parallel and circumferential to the implant surface and constitute the apical part of the biologic width.

Connective tissue graft

A soft tissue graft made of connective tissue.

Consolidation period

See: [Distraction osteogenesis \(DO\)](#).

Contact osteogenesis

The formation of new bone directly on a dental implant, following the migration of osteogenic progenitor cells through the fibrin clot matrix to the implant surface.

See: [Distance osteogenesis](#).

Contact Scanner

Contact 3D scanners probe the object through physical touch, converting the data into a digital file to be used for dental CAD/CAM applications.

See: [Custom abutment](#), [CAD/CAM](#), [CAM abutment](#)

Continuous suture

Syn: [Uninterrupted suture](#).

Suture made from an uninterrupted series of tissue penetrations, fastened at each end by a knot.

See: [Interrupted suture](#).

Continuous wave mode (Cw-mode)

Type of operation in which the laser emits radiation energy as a constant, uninterrupted stream.

Control group

A group of subjects which receives a placebo instead of the experimental treatment

but is treated in all other respects in the same way as the experimental group.

See: [Case-control study](#), [Experimental group](#).

Conversion prosthesis

See: [Transitional prosthesis/restoration](#).

Coolant

A fluid used as an irrigating solution to reduce heat generated during drilling.

Coping

A prefabricated or custom component that fits onto a dental implant or abutment.

Coping design

Specific coping shape or pattern, or the method by which it is made or planned. The coping is specific for use within an implant system.

Coping screw

See: [Prosthetic screw](#).

Coping, Telescopic*See: Telescopic coping***Coralline**

A form of ceramic from the calcium carbonate skeleton of coral, used as a bone substitute.

*See: Alloplast.***Coregistration***Syn: Registration.***Coronally advanced flap***See: Coronally positioned flap***Coronally positioned flap**

A flap sutured in a direction coronal to its original presurgical position.

*See: Apically positioned flap.***Correlation coefficient**

Number between -1 and +1 which measures the degree to which two variables are linearly related. -1 indicates perfect linear negative relationship between two variables, +1 indicates perfect positive linear relationship and 0 indicates lack of any linear relationship.

Cortical bone*See: Bone.***Cortical bone graft**

Graft consisting of compact bone.

*See: Cancellous bone graft, Corticocancellous bone graft.***Cortical bone pin**

Machined from mineralized cortical allograft, pins formulated for dental surgical procedures provide a natural approach to space maintenance, especially for sites that have lost facial or buccal cortex. Cortical bone pins can be used instead of titanium screws which have to be removed.

Corticotomy

A surgical technique in which only the bony cortex is surgically cut.

Cortisone

An oral, intramuscular, and intravenous glucocorticoid with a short half-life.

*See: Glucocorticoid.***Corticocancellous bone graft**

Graft consisting of compact and medullary bone.

Corticosteroid

Any of the steroid hormones produced by the adrenal cortex or their synthetic equivalents. They are involved in a wide range of physiologic systems such as stress response, immune response and regulation of inflammation, carbohydrate metabolism, protein catabolism, blood electrolyte levels, and behavior.

*See: Glucocorticoid.***Countersink**

To enlarge with a specific drill the coronal part of an osteotomy, to accommodate the neck of a dental implant.

Countersink drill

Drill used to enlarge the coronal part of an osteotomy.

Cover screw

Syn: Closure screw, Healing screw. A cap type screw used to seal the platform of an implant during osseointegration.

Cover screw mill

Instrument or device used to remove excess bone growth over a cover screw.

Craterization*See: Pericervical saucerization.***Crest**

A projection. Usually refers to the most coronal portion of an edentulous ridge.

*See: Alveolar crest.***Crestal**

Pertaining to the crest or the most coronal portion of the ridge.

Crestal bone loss

Bone resorption of the most coronal aspect of the ridge around the neck of the implant.

Crestal implant placement

The placement of a dental implant with the edge of its platform at the crest of bone.

1. Subcrestal implant placement: The placement of a dental implant with the edge of its platform apical to the crest of bone.

2. Supracrestal implant placement: The placement of a dental implant with the edge of its platform coronal to the crest of bone.

Crestal incision

An incision made at the crest of the edentulous ridge.

See: Midcrestal incision, Mucobuccal fold incision, Paracrestal incision.

Crevicular epithelium*See: Sulcular epithelium.***Critical bending moment**

The moment at which the external nonaxial load applied overcomes screw joint preload, causing loss of contact between the mating surfaces of the dental implant screw joint components.

Critical-size(d) defect (CSD)

Smallest osseous defect that does not completely heal by spontaneous bone regeneration. Its size varies by anatomic location and species.

Cross-arch stabilization*Syn: Bilateral stabilization.*

Resistance against dislodging or rotational forces obtained by a prosthetic design that uses dental implants and/or natural teeth on opposite sides of a dental arch and which are splinted together.

See: Splinting.

D

Cross-sectional slice

A thin, reformatted section of computed tomography scan data representing the alveolar process perpendicular to a panoramic curve of the patient's mandible or maxilla as defined in the axial slice.

See: Axial slice, Panoramic reconstruction, coronal slice

Cross-sectional study

A type of study that involves the observation of a defined population at a single point in time or time interval.

Crown height space (CHS)

Distance from the crest of bone, to the plane of occlusion in the posterior region and to the incisal edge of the same arch in the anterior region, available for a prosthesis.

Crown-implant ratio

The ratio of the crown height to the length of a dental implant embedded in bone. The "crown height" extends from the most

coronal bone to-implant contact to the most coronal aspect of the prosthetic reconstruction connected to that implant.

Cryotherapy

Extraorally, the postsurgical application of cold dressings to reduce inflammation and pain. Intraorally, the freezing of tissue with a cold device.

C-telopeptide cross-linked collagen type 1

Syn: C-terminal telopeptide of type 1 collagen.

Fragment of collagen released during bone remodeling and turnover. It is a biochemical marker in a variety of osseous metabolic diseases such as osteoporosis.

CTX/CTx Test

Abbr: C-telopeptide test for type 1 collagen.

Certain research supports the use of the CTX test as predictive of osteonecrosis of the jaw bone in patients exposed to bisphosphonates.

Cumulative success rate

Measure of percentage of implant success over a period of time.

See: Success rate.

Cumulative survival rate

Measure of percentage of implant survival over a period of time.

See: Survival rate.

Curettage (bone)

See: Bone curettage.

Custom abutment

A custom component created for a patient-specific clinical application to support a restoration which can be generated by a castable abutment, 3-D printing, or by CAD/CAM.

See: CAD/CAM abutment, CAM abutment, Castable abutment.

Cutting resistance analysis (CRA)

The energy (J/mm^3) required for a current-fed electric motor in cutting off a unit volume of bone during implant surgery, used to assess bone density.

Cylinder implant

An endosseous, root-form, press-fit dental implant, with parallel-sided walls.



Cylinder wrench

Device that fits on top of a dental implant and is used to tighten the implant after its placement. It can also be used to place an implant into its osteotomy.

Cylindrical implant

An endosseous, root-form dental implant, with parallel-sided non-threaded walls.



Cytokine

Any of several regulatory proteins, such as the interleukins and lymphokines, that are released by cells of the immune system and act as intercellular or intracellular mediators in the generation of an immune response.

Data merge

Diagnostic information obtained from a CT/CBCT scan, combined with visual surface data from an intra-oral or desktop optical scanner.

Decortication

Intraoperative perforation or removal of cortical bone to induce bleeding and release of bone forming cells from the underlying marrow, routinely used in combination with onlay block grafts or guided bone regeneration procedures.

Defect

An imperfection, failure, or absence.

See: Alveolar defect, Ridge defect.

Definitive prosthesis

The final prosthetic reconstruction.

Dehiscence

1. Incomplete coverage or cleft-like absence of bone at a localized area around a tooth or

a dental implant, extending for a variable distance from the crest.
See: Fenestration.

2. Premature opening of a primary soft tissue closure.

Delayed loading

Refers to the time of applying occlusal forces to a dental implant after its initial placement. A prosthesis is attached or secured after a conventional healing period.

Demineralized bone matrix (DBM)

A composite of collagenous and noncollagenous proteins and bone growth factors remaining after the extraction of minerals from the bone by a chemical process.

Demineralized freeze-dried bone allograft (DFDBA)

An allograft composed of demineralized bone matrix (DBM), following the demineralization of freeze-dried bone allograft (FDBA).

Dense PTFE (dPTFE)

Also known as high-density PTFE or dPTFE, is manufactured to eliminate expansion of the nodes and fibrils, resulting in a micro-porous material

that is impervious to bacteria while still allowing diffusion of gases and small molecules. Dense PTFE was designed to withstand exposure in the oral environment, which represents an improvement to earlier versions of ePTFE in many applications, especially socket preservation where deliberate membrane exposure offers several advantages.

See: Polytetrafluoroethylene (PTFE), Expanded polytetrafluoroethylene (ePTFE).

Dental implant

1. A biocompatible device placed within, or on, the bone of the maxilla or mandible, to provide support for a prosthetic reconstruction.

2. ISO definition: "A device designed to be placed surgically

within or on the mandibular or maxillary bone to provide resistance to displacement of a dental prosthesis." (ISO 1942-5)

Dentin grinder

A medical device with a rotating blade grinds a complete non-endodontically treated tooth removed of all visible tissue debris into 300 -1200um particles for the purpose of creating autogenous demineralized dentin matrix (ADDM). The remnants are then placed into a small vial and treated with a specific cleanser for 10 min. The cleanser is then removed and the particles cleansed with saline solution for 3 min. The saline is absorbed off and the material is ready for use as an autologous bone graft.

See: Autogenous Demineralized Dentin Matrix (ADDM), Bone scaffold.

Denture

A prosthesis for the replacement of missing teeth and adjacent soft tissues.

See: Fixed prosthesis, Removable prosthesis.

De-osseointegration

The loss of a previously achieved osseointegration of a dental implant due to peri-implantitis, occlusal overload, or other factors.

Depassivation

Loss or removal of the surface oxide layer of a metal.

Deproteinized bovine bone material

See: Anorganic bovine bone matrix (ABBM).

Depth gauge

Graduated instrument with markings designed to measure the vertical extent of an osteotomy preparation.

Dermal graft

Tissue graft from a human or animal cadaver, which has undergone a process of de-epithelialization and de-cellularization leaving an immunologically inert avascular connective tissue.

Desktop optical scanner

A device which uses advanced optical imaging technology to capture surface information from a dental cast or a dental impression and converts these objects into digital data to be utilized with CAD CAM or 3-D printing software applications.

See: Standard Tessellation Language or Standard Triangulation Language (STL), Intraoral scanner, 3-D scanner, Digital workflow, Digital impressions

Design (implant)

The three-dimensional structure of a dental implant or component, with all the elements and characteristics that compose it: form, shape, configuration, surface macrostructure, and micro-irregularities.

Device orientation

The direction in which a distraction device is positioned, usually relative to the anatomical axis of the bone segments to be distracted.

Dexamethasone

A long-acting synthetic glucocorticoid used as a potent anti-inflammatory drug. It may be administered intramuscularly, orally, or intravenously.

See: Glucocorticoid.

Diabetes mellitus (DM)

Syndrome characterized by disordered metabolism and abnormally high blood sugar resulting from insufficient levels of the hormone insulin. In implant dentistry good diabetic control is a prerequisite to achieving and maintaining osseointegration.

See: Glycosylated hemoglobin A1c test (HbA1c test).

Diagnostic wax-up

Laboratory procedure in which teeth are created in wax according to the planned restoration. It may be used to evaluate the feasibility of a proposed plan and to fabricate a radiographic template, a surgical guide, or laboratory guides.

Digital imaging and communication in medicine (DICOM)

A standard of conformity used by the majority of imaging hardware (CT/CBCT) and software manufacturers for handling, storing, printing, and transmitting information in medical digital diagnostic imaging. It allows three-dimensional imaging data from different manufacturers to be used in third party software for visualization, surgical evaluation, and creation of CAD/CAM models and appliances. DICOM enables the integration of digital diagnostic imaging modalities into a picture archiving and communication system (PACS).

See: [PACS](#)

Digital impressions

The use of intraoral optical scanners to acquire tooth morphology, gingiva morphology, and occlusion in a digital format for the purpose of aiding in the diagnosis and treatment planning phase, fabricating a dental prosthesis, for orthodontic applications, or to fabricate surgical templates for dental implants or oral surgery procedures. Currently, all of the various chairside intraoral digital scanning devices are based on optical principles such as blue light-emitting diodes, blue laser technology, multiple single images that are stitched together, and continuous acquisition (streaming) of optical images. Optical scanners depend upon a reflective surface and may require a contrasting medium or powder to acquire the surface representation of the tooth morphology.

See: [Intraoral scanner](#), [digital workflow](#), [CAD/CAM](#)

Digital radiography

A form of X-ray imaging, where digital X-ray sensors (digital image capture device) are used instead of traditional photographic film. Advantages include time efficiency through bypassing chemical processing and the ability to digitally transfer and enhance images. Also, less radiation can be used to produce an image of similar contrast to conventional radiography.

See: [Sensor \(Digital X-ray\)](#), [Sensor \(CBCT\)](#), [Intraoral digital X-ray sensor](#)

Digital volume tomography (DVT)

See: [Cone-beam computed tomography \(CBCT\)](#).

Digital workflow

The clinical and laboratory steps to acquire intraoral and/or extraoral patient information in a digital format for the purpose of aiding in the diagnosis and treatment planning phase, from

initial chairside scanning to the fabrication of a dental prosthesis in the dental laboratory.

See: [Intraoral scanner](#), [CAD/CAM](#), [3-D printing](#), [3-D scanner](#), [Data merge](#).

Diphosphonate

See: [Bisphosphonate \(BP\)](#).

Direct impression

See: [Open-tray impression](#).

Direction indicator

Device inserted into an osteotomy in order to assess its orientation or position relative to adjacent teeth and anatomic structures. Also used to verify and assist in achieving parallelism in the preparation of multiple osteotomies.

Direct Metal Laser Sintering (DMLS)

An Additive Manufacturing process whereby a 200 Watt Ytterbium (Yb) fiber-optic laser moves across a bed of powdered metal melting/welding the

metal in very thin layers (about 200um) according to the build protocol. After each solidified layer, a recoater blade applies new powder evenly distributed across the build platform using a recoater blade until the entire build file (STL File) is complete. The process has high resolution and good surface detail.

See: [Additive Manufacturing \(AM\)](#), [Standard Tessellation Language or Standard Triangulation Language \(STL\)](#), [Rapid prototyping](#), [3-D printing](#)

Direct sinus graft

See: [Lateral window technique](#), [Sinus graft](#).

Disc implant

An endosseous dental implant consisting of a plate, neck, and abutment. The implant is inserted laterally into the edentulous ridge.



Distal extension

Edentulous space posterior to the most distal tooth or implant abutment.



Distal extension prosthesis

A restoration extending posterior to the most distal tooth or implant abutment. The extension can be unilateral or bilateral and in the form of an artificial tooth or teeth, cantilever on a fixed prosthesis, or a removable partial denture.

Distance osteogenesis

A gradual process of bone healing from the edge of an osteotomy toward a dental implant. Initially, bone does not grow directly onto the implant surface.

See: [Contact osteogenesis](#).

Distraction

See: [Distraction osteogenesis \(DO\)](#).

Distraction axis

The direction in which the bone segment is distracted, during distraction osteogenesis.

Distraction device

An appliance that allows gradual incremental movement of bone segments away from each other.

See: Distraction osteogenesis (DO).

Distraction osteogenesis (DO)

Syn: Osteodistraction.

The gradual and controlled distraction of two vascularized bone segments created by an osteotomy. Formation of new soft tissue and bone between vascular bone surfaces created by an osteotomy and separated by gradual and controlled distraction. It begins with the development of a reparative callus. The callus is placed under tension by stretching, which generates new bone. Distraction osteogenesis consists of three sequential periods:

1. Latency period: The period from bone division (i.e., surgical separation of bone into two segments) to the onset of traction, and represents the time allowed for callus formation.

2. Distraction period: The time when gradual traction is applied to bone segments and new tissue (regenerate tissue) is formed.

3. Consolidation period:
Syn: Fixation period.

Consolidation and corticalization of the distraction regenerate after traction forces and segment movement are discontinued.

Distraction parameters

Biological and biomechanical variables that affect the quality and quantity of bone formed during distraction osteogenesis.

Distraction period

See: Distraction osteogenesis (DO).

Distraction protocol

The sequence and duration of treatment events during distraction osteogenesis.

Distraction rate

The total amount of distraction in millimeters performed per day.

Distraction regenerate

See: Regenerate.

Distraction rhythm

The number of increments per day into which the rate of distraction osteogenesis is divided.

Distraction vector

The final direction and magnitude of traction forces during distraction osteogenesis.

Distraction zone

See: Regenerate.

Distractor

See: Distraction device.

Disuse atrophy

Diminution in dimension and/or density of bone, resulting from inadequate loading by physiologic forces.

Dolder bar

Prefabricated U-shaped bar used to connect teeth, tooth roots, or implant abutments to provide support and retention using a sleeve incorporated into the intaglio surface of a removable prosthesis.

Donor site

Area of the body from which a graft is harvested. Examples include skin, mucosa, connective tissue, and bone.

Drill

A cutting instrument used to create holes by rotary motion.

Drill extender

See: Extender.

Drill guide

See: Drilling guide.

Drilling guide

A surgical guide used to accurately direct the drilling direction and depth during osteotomy preparation.

See: Stereolithographic guide, Surgical guide, Drill sleeves, Drill path.

Drill path

The trajectory of the drill during osteotomy preparation for dental implant placement. The drill can be controlled in a free-hand manner, or controlled through the use of a surgical guide which may contain drill sleeves.

See: Drill sleeves, Surgical guide, Surgical template, template-assisted, diagnostic free-hand, full template guidance

Drilling sequence

The use of drills in a specific order to gradually prepare and increase the diameter of an osteotomy prior to dental implant insertion, usually based on manufacturer's sequential drilling protocol.

See: Sequential drilling.

Drill stop

Device attached to a drill to control the depth of an osteotomy.

Drill sleeves

Surgical templates which contain metal cylinders used to help control that correspond to the diameter of the drills the osteotomy for dental implant placement, or fixation screws to stabilize the surgical template.

See: Guided sleeve, Guided cylinder.

Dual-energy X-ray absorptiometry (DXA)

Test measuring bone mineral "density" (BMD). Two low-dose x-ray beams with differing energy levels are aimed at the patient's bones. By subtracting the soft tissue absorption, the BMD can be determined from the absorption of each beam by bone.

E

Dual Scan Protocol

The process of combining two different datasets – (1) a scan of a prosthesis (of the desired restorative result) made of an acrylic material, with radiopaque or fiducial markers and; (2) a CT/CBCT scan of the patient with the prosthesis in the mouth. The two datasets will then be accurately superimposed through a software registration process to aid in the diagnosis, treatment planning, and surgical guide fabrication.

See: guided surgery, Cone-beam computed tomography (CBCT), Fiducial markers, Scanographic template, Registration.

Dynamic loading

Situation where a dental implant is subject to a force which varies in magnitude and/or direction (e.g., during occlusal function)

See: Static loading.

Dysesthesia

An abnormal and unpleasant sensation that is either spontaneous or evoked. Note: Dysesthesia includes paresthesia but not vice versa.

See: Anesthesia, Hyperesthesia, Hypoesthesia, Paresthesia.

Ear prosthesis

Fixed-removable artificial replacement for all or part of a human ear fabricated with silicone, or other materials. Can be attached with specially designed dental implants.

See: Auricular prosthesis, Percutaneous implant

Early crestal bone loss

Crestal bone loss occurring around a dental implant during the first year after exposure to the oral environment, and attributed in part to the formation of the biologic width.

Early implant failure

Syn: Primary implant failure. The failure of a dental implant due to the failure to establish osseointegration.

Early loading

Refers to the time of applying occlusal forces to a dental implant after its initial placement. A prosthesis is attached to the implant(s), earlier than a more conventional healing period.

Edentulism

The condition of missing one or more teeth, partial or complete loss of teeth.

Edentulous

Without teeth.

Edentulous site

See: Edentulous space.

Edentulous space

Area previously occupied by a tooth or teeth.

Elastic modulus

See: Modulus of elasticity.

Electric discharge method (EDM)

Syn: Spark erosion.

A precision metal removal process, using a series of electrical sparks, to erode material from a workpiece in a liquid medium under carefully controlled conditions.

Electron Beam Melting (EBM)

A type of additive manufacturing for metal parts. It is often classified as a rapid manufacturing method. The technology manufactures parts such as crown copings by melting metal powder layer by layer with an electron beam in a high vacuum. Unlike some metal sintering techniques, the parts are fully dense, void-free, and extremely strong.

See: Additive Manufacturing (AM), Rapid prototyping

Element

Any portion of an implant prosthesis identified by position or function as transmucosal, retentive, attachment, or dental.

Emergence profile

The part of the axial contour of a tooth or prosthetic crown that extends from the base of the sulcus past the free soft tissue margin. The emergence

profile extends to the height of contour of the crown, producing a straight or convex profile in the apical third of the axial surface.

Enamel matrix derivative (EMD)

Sterile protein aggregate from enamel matrix, amelogenins, the precursor of enamel of developing teeth. The proteins are harvested from around developing pig embryo teeth, with special processing procedures.

Endodontic implant

Syn: Endodontic pin, Endodontic stabilizer.

A pin placed into a root canal of a tooth and extending beyond its apex, into the bone.

Endodontic pin

See: Endodontic implant.

Endodontic stabilizer

See: Endodontic implant.

Endosseous

See: Intrabony, Intraosseous.

Within the bone.

Endosseous distractor

Syn: Intraosseous distractor.

A distraction device placed into the edentulous ridge and/or basal bone of the maxilla or mandible used in distraction osteogenesis.

Endosseous implant

Syn: Endosteal implant.

A device placed into the alveolar and/or basal bone of the maxilla or mandible and used to support a prosthesis.

**Endosseous ramus frame implant**

A full-arch, endosseous implant set into both rami and the symphyseal area of the mandible with a horizontal connecting bar that sits along the gingival tissues, thus forming a U-shaped design when viewed from the occlusal.

See: Ramus implant.

Endosteal implant

See: Endosseous implant.

Endosteum

Tissue lining the medullary cavity of bone. It is composed of a single layer of osteoprogenitor cells and a small amount of connective tissue.

Engaging

Feature of a dental implant or prosthetic component that incorporates an anti-rotation mechanical design.

Envelope flap

Flap that is elevated from a horizontal linear incision, parallel to the free gingival margin, with no vertical incision. It may be sulcular or submarginal.

Epithelial attachment

The mechanism of attachment of the junctional epithelium to a tooth or dental implant, i.e., hemidesmosomes.

See: Junctional epithelium.

Epithelial implant

See: Mucosal insert.

Epithelialization

Healing by growth of epithelium over connective tissue.

Epithelium

Tissue lining the intraoral mucosal surfaces, extending into the sulcus and adhering to a dental implant or tooth.

Eposteal implant

Device that receives its primary bone support by means of resting upon bone.

See: Subperiosteal implant.

Erbium-doped yttrium aluminum garnet (Er-YAG laser)

A solid-state laser containing an Er-YAG crystal which emits a wavelength of 2940 nanometers. It is mainly used in bone surgery.

Esthetic Buccal Flap (EBF)

A flap design that helps to preserve the soft tissue architecture while gaining access to the facial cortical plate of bone when implants placed in an ideal prosthetic position result in perforations which can then be corrected with guided bone regeneration (GBR).

See: Guided bone regeneration (GBR).

Esthetic zone

Any dento-alveolar segment visible upon full smile. The relationship of the three components involved in the smile (i.e., gingiva, lips, teeth) determines whether a particular smile is considered high or low.

Etching

Use of acids or other agents (etchants) to increase the surface area of a dental implant or other materials.

Exclusion criteria

The specific characteristics that prevent a participant from entering a clinical trial or study group.

See: Inclusion criteria.

Exfoliation

The loss of implanted materials or devices.

Expanded polytetrafluoroethylene (ePTFE)

A polymer of tetrafluoroethylene, heated and then stretched to allow fluid passage but not cells, used as a nonresorbable membrane in guided bone regeneration (GBR) and guided tissue regeneration (GTR). It is used with or without titanium reinforcement to maintain its shape. It is also used as a nonabsorbable suture material.

See: Dense PTFE (dPTFE).

Experimental group

Syn: Test group.

A group of subjects who receive the treatment being studied.

See: Control group.

Exposure

1. Dental implant: The dehiscence of soft tissue exposing the dental implant cover screw, neck, body, or threads. Colloquial term for stage-two surgery.

2. Barrier membrane: The dehiscence of soft tissue exposing an occlusive membrane during the healing period.

Extender

A surgical component used as an intermediary piece between the handpiece or wrench and another component (e.g., drill, implant mount) to increase the effective reach of the latter.

F

External bevel incision

Blade-cut, made in an apical-coronal direction, designed to reduce the thickness of gingiva or peri-implant mucosa from the external surface.

See: [Internal bevel incision](#).

External connection

A prosthetic connection interface external to the dental implant platform. The external hexagon is an example.

See: [Internal connection](#).

External hexagon

A hexagonal connection interface of the platform of a dental implant extending coronally. It prevents gross rotation of the attached component.

External irrigation

Method of irrigation during the drilling of osteotomies for the placement of dental implants from an external device, whereby the cooling solution is directed

at the drilling bur during preparation of the osteotomy. This method delivers the cooling solution at the entrance of the osteotomy. The cooling solution may be delivered through tubing connected to the handpiece and drilling unit, or it may be from a hand-held system.

External oblique ridge

Bony ridge on the buccal aspect of the mandibular molars which serve as a source of autogenous bone for intraoral grafting procedures.

External sinus graft

See: [Lateral window technique](#), [Sinus graft](#).

Extracellular matrix (ECM)

Any material produced by cells and excreted into the extracellular space within tissues. It takes the form of both ground substance and fibrous elements, proteins involved in cell adhesion, glycosaminoglycans, and other

space-filling molecules.

Extraction socket

An alveolar space after tooth removal.

Extraction socket graft

See: [Ridge preservation](#).

Extraoral (external) distraction device

A device that is located outside the oral cavity and used in distraction osteogenesis. The bone segments are usually attached via percutaneous pins connected externally to device fixation clamps.

Extraosseous distractor

A distraction device placed outside the edentulous ridge and/or basal bone of the maxilla or mandible, used in distraction osteogenesis.

Exudate

Fluids, cells, and cellular debris that have escaped from blood vessels and are deposited in tissues or on tissue surfaces, usually as a result of inflammation.

Facebow

A dental instrument that is used in the field of prosthodontics / restorative dentistry. Its purpose is to transfer functional and aesthetic components from patient's mouth to the dental articulator. Specifically, it transfers the relationship of maxillary arch and temporomandibular joint to the casts.

See: [Articulator](#)

Facial prosthesis

Maxillofacial artificial replacement for a part of the face missing due to traumatic injury, surgical intervention due to carcinoma related lesions, or congenital defects. Facial prosthetics may be stabilized or fixated with the support of specially designed dental implants.

Facing

Usually a tooth colored material such as a porcelain laminate veneer, or resin bonded veneer to the visible surface of a prepared natural tooth or prosthetic replacement. The material may also be pink in color to replace missing gingival tissue on implant supported restorations.

See: [Veneer](#)

Failed implant

A dental implant that is mobile (has not achieved or has lost osseointegration), or that is symptomatic in spite of osseointegration.

Failing implant

General term for a dental implant that is progressively losing its supporting bone anchorage. It may exhibit increased probing depth, purulence, but is still clinically stable.

Sugg: [Peri-implantitis](#).

Failure rate

The percentage of failures in a study or clinical trial, of a procedure or device (e.g., dental implant), according to defined criteria.

Fatigue

Progressive weakening of a structure by accumulating embrittlement and crack formation/propagation.

Fatigue failure

A structural failure caused by multiple loading episodes when all loads lie below the structure's ultimate strength. Typically, such failures occur after multiple loading episodes.

Fatigue fracture (failure)

Structural failure caused by repetitive stresses, which cause a slowly propagating crack to cross the material.

Feldspathic Porcelain

Highly translucent, esthetic material for restorations fabricated with the traditional veneering porcelain powder and liquid brush build-up technique. Opaquer can be added by the laboratory when necessary to cover dark stain cases.

Fenestration

Buccal or lingual window defect of either denuded bone or soft tissue occurring over a tooth root, implant, or alveolar ridge. A lateral window opening to the maxillary sinus for a sinus augmentation procedure is a man-made fenestration.

See: Dehiscence

Fibrin Matrix (Fibrin-Rich Matrix)

Provisional matrix provided by the fibrin clot and fibronectin during the first phase of wound healing, helping monocytes, fibroblasts, and epidermal cells migrate into the healing area. A membrane-like

matrix derived from autologous blood which is strong, pliable, and can be sutured for use as a stand-alone product to improve wound healing and promote tissue regeneration.

See: Leukocyte and Platelet Rich Fibrin (L-PRF), PRF, Fibronectin

Fibroblast

Cell found within connective tissues responsible for synthesis of collagen and ground substance.

Fibronectin

A high-molecular weight (~440kDa) glycoprotein of the extracellular matrix that binds to membrane-spanning receptor proteins called integrins. Similar to integrins, fibronectin binds extracellular matrix components such as collagen, fibrin, and heparan sulfate proteoglycans (e.g. syndecans), helping to promote cellular adhesion and/or migration, and are involved in aggregation of platelets.

Fibrous

Composed of or containing fibers.

Fibrous connective tissue

Composed of parallel bundles of collagen fibers, found in the dermis, tendons, and ligaments. Also called dense connective tissue.

Fibrous encapsulation

Layer of fibrous connective tissue formed between a dental implant and surrounding bone.

Fibrous integration

See: Fibrous encapsulation.

Fiducial markers

Specialized markers that are supplemented onto the operative field prior to the imaging scan and are used during surgery as the key reference points for the patient's registration procedure, or during surgical guide fabrication for the transfer of information from software-based planning.

See: Registration

Finite element analysis (FEA)

Computer software method used to study stresses and strains on mechanical parts or components. Virtual prototyping software, often a component of computer-aided design software programs, which automatically generates the simulated mechanical loads for FEA.

First-stage surgery

See: Stage-one surgery.

Fistula

An abnormal passage or communication, usually between two internal organs or leading from an internal organ to the surface of the body.

1. Oroantral fistula: An opening between the oral cavity and the maxillary sinus.
2. Orofacial fistula: An opening between the cutaneous surface of the face and the oral cavity.
3. Oronasal fistula: An opening between the nasal cavity and the oral cavity.

Fixation period

See: Distraction osteogenesis (DO).

Fixation pin

See: Anchor pin, Fixation screw, Stabilization pin

Fixation screw

Screw used for the stabilization of a block graft or a barrier membrane. Fixation screw can also be used to stabilize a surgical guide.

See: Anchor pin, Fixation pin, Stabilization pin, Surgical guide.

Fixation tack

See: Tack.

Fixed-detachable

Prosthesis fixed to a dental implant or implants, only removable by the dentist.

Fixed hybrid prosthesis

Non-removable hybrid prosthesis.

See: Hybrid prosthesis, Fixed-removable.

Fixed prosthesis

A restoration that is not removable by the patient. The restoration may be partial arch (FPD: Fixed partial denture), or complete arch (FCD: Fixed complete denture).

See: Denture, Removable prosthesis.

Fixed-removable

Prosthesis fixed to an implant or implants, only removable by the dentist.

Sugg: Fixed prosthesis.

Fixture

Obj See: Root-form implant.

Fixture-level impression

See: Implant-level impression

Flank angle

The angle made by the flank of a screw thread with a line perpendicular to the axis of the screw.

Flap

Loosened section of soft tissue separated from the surrounding tissues, except at its base, for surgical access.

See: Apically positioned flap, Beveled flap, Coronally positioned flap, Envelope flap, Full-thickness flap, Gingival flap, Partial thickness flap, Positioned flap.

Flapless implant surgery

Surgical technique where no soft tissue flaps are raised or when a circular piece of tissue is removed to permit placement of a dental implant.

Flat panel detectors

A square or rectangular amorphous plate with a scintillator that replaces film, used in cone-beam computed tomography. It acts primarily through an osteoconductive process.

Fracture

Failure caused by growth of a crack.

Framework

Supporting structure of a prosthetic reconstruction.

Free soft tissue autograft

See: Gingival graft.

Free-standing implant

A dental implant that is not splinted to adjacent teeth or implants.

Freeze-dried bone allograft (FDBA)

Bone harvested from donor cadavers, washed, immersed in ethanol, frozen in nitrogen, freeze-dried and ground to particles ranging in diameter from 250 to 750 microns.

It acts primarily through an osteoconductive process.

Freeze-drying

Syn: Lyophilization.

A method of tissue preparation in which the specimen is frozen and then dehydrated at low temperature in high vacuum.

Frenectomy

Surgical incision of a muscle attachment, or frenulum, including its attachment to the underlying bone due to functional or esthetic needs of the patient. The procedure can be accomplished with a scalpel blade, or laser.

Friction-fit

See: Friction-retained, Press-fit.

Friction-retained

Use of intimate fit of parts for the retention of an abutment or a prosthesis (e.g., spark erosion prosthesis).

See: Attachment-retained, Cement-retained, Screw-retained.

Full arch bridge/prosthesis

Restoring the entire arch: Patients who are missing, or need to remove all teeth in one or both jaws, can be restored with a fixed full-arch prosthesis

Full-thickness flap

Syn: Mucoperiosteal flap.

A flap resulting from the elevation of the gingival, alveolar mucosa, and periosteum in one unit, thereby exposing the surface of bone.

See: Partial thickness flap.

Functional loading

Obj See: Occlusal loading.

Fused Deposition Modeling (FDM)

An additive manufacturing technology commonly used for modeling, prototyping, and production applications. FDM works on an “additive” principle by laying down material in layers. A plastic filament or metal wire is unwound from a coil and supplies material to an extrusion nozzle which can turn the flow on and off. The nozzle is heated to melt the material and can be moved in both horizontal and vertical directions by a numerically controlled mechanism, directly

controlled by a computer-aided manufacturing (CAM) software package. The model or part is produced by extruding small beads of thermoplastic material to form layers as the material hardens immediately after extrusion from the nozzle.

See: Additive Manufacturing (AM), 3-D printing, Rapid prototyping

Fusobacterium nucleatum

Fusobacterium nucleatum is an oral bacterium, indigenous to the human oral cavity, that plays a role in periodontal and peri-implant disease. This organism is a key component of periodontal plaque due to its abundance and its ability to coaggregate with other species in the oral cavity

G**Gap**

See: Edentulous space.

Gap distance

The space between the bony walls of an osteotomy or an extraction socket and a dental implant at stage-one surgery. The dimension of the gap and type of implant surface influence the level of the first bone-to-implant contact.

Gingiva

Part of the masticatory mucosa, which covers the alveolar process and surrounds the cervical portion of teeth. It consists of an epithelial layer and an underlying connective tissue layer called the lamina propria.

Gingival crevicular fluid (GCF)

An inflammatory exudate that can be collected at the gingival margin or within the gingival crevice. The biochemical analysis of the fluid offers a non invasive means of assessing the host response in periodontal disease.

Gingival flap

A flap that does not extend apical to the mucogingival junction.

Gingival graft

Syn: Free soft tissue autograft. Surgical procedure performed to establish an adequate amount of keratinized tissue around a tooth or dental implant, or to increase the quantity of tissue of an edentulous ridge.

Gingival recession

Syn: Marginal tissue recession. The exposure of the roots of the teeth caused by a loss of gingival tissue and/or retraction / displacement of the gingival margin from the crown of the teeth apical to the cementoenamel junction, or the implant-abutment connection.

Gingival sulcus

The gingival sulcus is an area of potential space between a tooth and the surrounding gingival tissue and is lined by sulcular epithelium. The depth of the sulcus is bounded by two entities: apically by the gingival fibers of the connective tissue attachment and coronally by the free gingival margin. There is also a gingival sulcus surrounding the implant-abutment-tooth complex emerging from the bone, surrounded by soft tissue.

Glucocorticoid

A class of steroid hormones characterized by an ability to bind with the glucocorticoid receptor. Their main therapeutic use in dentistry is as an anti-inflammatory and immunosuppressant agent.

See: Betamethasone, Dexamethasone, Methylprednisolone, Prednisolone, Prednisone, Triamcinolone.

Glycosylated hemoglobin A1c test (HbA1c test)

Syn: Glycated hemoglobin A1c test. Lab test which reveals average plasma glucose concentration over a period of three months. Specifically, it measures the number of glucose molecules attached to hemoglobin. Results are expressed as a percentage, with 4 to 6% considered normal.

Gold cylinder

See: Prefabricated cylinder.

Graft

Material or tissue used for implantation or transplantation.

Graft consolidation (bone)

The vascularization and integration at the cellular level of a graft with its recipient site. It involves the formation of a graft-woven bone complex that remodels into lamellar bone and further adapts based on loading.

Grafting material

A substance, natural or synthetic, used to enhance or repair a tissue defect or deficiency.

Grit blasting

Delivery to a dental implant surface of a high velocity stream of abrasive particles propelled by compressed air, designed to increase surface area.

Growth factor

Any highly specific protein that stimulates the division and differentiation of a particular type of cells.

See: Cytokine, Insulin-like growth factors (IGF), Platelet-derived growth factors (PDGF), Platelet-rich plasma (PRP), Transforming growth factor beta (TGF- β), Vascular endothelial growth factors (VEGF).

Guidance

See: Image guidance.

Guide

See: Radiographic template, Stereolithographic guide, Surgical guide.

Guided bone regeneration (GBR)

Bone regenerative technique that uses physical means (e.g., barrier membranes) to seal off an anatomic site where bone is to be regenerated. The goal is to direct bone formation and prevent other tissues (e.g., connective tissue) from interfering with osteogenesis.

Guided cylinder

Syn: Guided sleeve.

Guide drill

Round-shaped or pointed drill used to mark the site of an osteotomy by making an initial entry into cortical bone.

H

Guided sleeve

Syn: Guided cylinder.

Round metal cylinder usually five millimeters in length and available in various diameters, which is incorporated into a surgical or stereolithographic guide to precisely position the drill and subsequently the dental implant during surgery.

*See: Surgical guid,
Stereolithographic guide.*

Guide pin

1. Device placed within a dental implant osteotomy to assist in determining the location and angulation of the site relative to adjacent teeth, implants or other landmarks.
2. Extended occlusal or abutment screws used during prosthesis fabrication in the laboratory.

Guided tissue regeneration

(GTR)

Dental surgical procedures that use barrier membranes to direct the growth of new bone and gingival tissue at sites with insufficient volumes or dimensions of bone or gingiva for proper function, esthetics or prosthetic restoration.

Handpiece motion tracker

An array of active emitters or passive reflectors that are attached to a surgical instrument to enable their localization within the operative field by an overhead detector.

Hard tissue graft

See: Bone graft, Bone replacement graft.

Harvest

To gather or collect hard or soft tissue for grafting purposes.

Haversian canal

Freely anastomosing channels within cortical (dense) bone containing blood and lymph vessels, and surrounded by concentric bone lamellae.

Haversian system

See: Osteon.

HbA1c test

Abbr: Glycosylated hemoglobin A1c test (HbA1c test).

Healing

Regeneration or repair of injured, lost or surgically treated tissue.

See: Healing by first (primary) intention, Healing by second (secondary) intention.

Healing abutment

Syn: Healing collar, Permucosal extension, Second-stage permucosal abutment, Temporary healing cuff.

Component, circular in cross-section, that connects to a dental implant and protrudes through the soft tissue. It functions in guiding the healing of the mucosal peri-implant tissues and when removed provides access to the platform.

See: Anatomic healing abutment.

Healing by first (primary) intention

Syn: Primary closure.

Healing of a wound in which the edges are closely re-approximated. Union or restoration of continuity occurs directly with minimal granulation tissue and scar formation.

Healing by second (secondary) intention

Syn: Secondary closure.

Healing of a wound in which a gap is left between its edges. Union occurs by granulation tissue formation from the base and the sides. This requires epithelial migration, collagen deposition, contraction, and remodeling during healing.

Healing cap

See: Hygiene cap.

Healing collar

See: Healing abutment.

Healing period

Syn: Healing phase.

The time allocated for healing following a surgery, before the next procedure is performed at the same site.

Healing phase

See: Healing period.

Healing screw

See: Cover screw.

Heat necrosis

Cell death due to effectively prolonged exposure of bone to elevated temperature, such as during osteotomy preparation.

Helical cone-beam computed tomography

See: Cone-beam computed tomography (CBCT).

Hematoma

A localized mass of extravasated blood, usually clotted, that is relatively or completely confined within an organ or tissue, a space or a potential space.

Hematopoietic stem cell

The precursor of a mature blood cell that is defined by its ability to replace the bone marrow system following its obliteration (e.g., by gamma-irradiation) and can continue to produce mature blood cells.

Hemorrhage

Escape of blood from the circulatory system, bleeding

which is often excessive and may be difficult to control.

Hemostasis

The arrest of bleeding, either physiologically, surgically, or mechanically.

Heterogeneous graft

See: Xenograft.

Heterograft

See: Xenograft.

Hex

The hexagonal shape of a connection interface, internal hex, or external hex.

Hexed

A component or a dental implant with a hexagonal connection interface.

High-water prosthesis

See: Hybrid prosthesis.

Histomorphometry

The quantitative study of the microscopic organization and

structure of a tissue (e.g., bone), especially by computer-assisted analysis of images acquired from a microscope.

Hollow basket implant

A root-form dental implant with a central internal channel penetrating the implant body from/at its apical aspect.

Homograft

Syn: Homogenous graft, Homologous graft.

A graft taken from one human subject and transplanted into another.

See: Allograft.

Homologous graft

See: Homograft.

Horizontal mattress suture

See: Mattress suture.

Host response

The local or systemic response of the host organism to an implanted material or device.

Host site

See: Recipient site.

Hounsfield unit (HU)

A unit of x-ray attenuation used for computed tomography scans as a measurement of bone density. The Hounsfield unit is a way to characterize radiation attenuation in different tissues and thus making it easier to define what a given finding may represent. It measures radiodensity and is a quantitative scale. Each volume pixel or voxel is assigned a value on a scale on which air is -1000, distilled water at standard pressure and temperature (STP) is defined as 0, and radiopaque structures such as compact bone will be in the range of +1000 and greater. Godfrey N. Hounsfield invented the first CT scanner in 1972.

See: Voxel, Computed tomography (CT)

Howship's lacuna

Minute depressions in the surface of a bone undergoing resorption.

Hybrid implant

An endosseous, root-form dental implant, with different surface geometries or textures at different levels.

Hybrid prosthesis

Syn: High-water prosthesis.

A screw-retained, metal-resin, implant-supported, fixed complete denture. The term "hybrid" implies a combination of a metal framework, with a complete denture (prefabricated resin teeth and heat polymerized resin). The term "highwater" refers to the design of this prosthesis using long standard abutments with several millimeters of space between the prosthesis and the underlying mucosa of the edentulous ridge.

HPISE

Abbr: Hydrodynamic Piezoelectric Internal Sinus Elevation

Hydroxyapatite (HA)/ Ca10(PO4)(OH)2

General term for calcium hydroxyapatite. Primary inorganic and natural component of bone, also used as an alloplast. Hydroxyapatite is also used to coat some dental implant surfaces.

See: Alloplast.

Hydroxyethyl methacrylate (HEMA)

Alloplastic material made of hydrosoluble monomer, which can polymerize under various circumstances at low temperatures. It can be used to prepare various hydrogels to immobilize proteins or cells for grafting purposes.

Hydroxylapatite (HA)

*See: Hydroxyapatite (HA)/
Ca10(PO4)(OH)2.*

Hygiene cap

*Syn: Comfort cap, Healing cap,
Sealing screw.*

Component inserted over a prosthetic abutment. Its function is to prevent debris and calculus from invading the internal portion of the abutment between prosthetic appointments.

Hyperbaric oxygen therapy (HBOT)

Treatment modality where a patient is placed in a pressurized chamber (hyperbaric chamber) that allows for the delivery of oxygen in high concentrations for therapeutic benefits. It is sometimes used prior to implant therapy for patients who underwent radiation therapy in the head and neck areas, to reduce the risks of osteoradionecrosis.

I

Hyperesthesia

A dysesthesia consisting of increased sensitivity, particularly a painful sensation from a normally painless touch stimulus.

Hyperplasia

Excessive enlargement of a tissue or structure due to an increase in the number of cells.

Hypodontia

Congenital absence of a tooth or teeth.

Hypoesthesia

Syn: Hypesthesia.
A dysesthesia consisting of abnormally decreased sensitivity, particularly to touch.

Ibuprofen

A nonsteroidal anti-inflammatory medication that possesses analgesic and antipyretic properties.

See: Nonsteroidal anti-inflammatory drug (NSAID).

Iliac crest

Superior part of the ilium used as a source of autogenous bone.

See: Iliac graft.

Iliac graft

A bone graft harvested from the crest of the iliac bone. The bone can be removed from the anterior iliac crest posterior to the anterosuperior iliac spine or the posterior ilium. The graft may be cancellous, cortical, or corticocancellous.

Image guidance

The use of preoperative imaging with computer-based planning tools for the diagnosis, planning, and execution of dental implant placement and prosthetic reconstruction.

See: Navigation surgery, Stereolithographic guide, Registration.

Image Stitching

The process of combining multiple photographic images, or CT/CBCT images with overlapping fields of view to produce a segmented panorama or high-resolution image, or a field of view image

See: Stitching.

Immediate functional loading

Obj See: Immediate occlusal loading.

Immediate implantation

See: Immediate implant placement.

Immediate implant placement

Placement of a dental implant at the time of tooth extraction, into the extraction socket.

Immediate loading

See: Immediate occlusal loading, Immediate non-occlusal loading.

Immediate non-functional loading

Obj See: Immediate non-occlusal loading.

Immediate non-occlusal loading

A clinical protocol for the placement of a dental implant(s) in a partially edentulous arch, with a fixed or removable restoration not in occlusal contact with the opposing dentition, at the same clinical visit.

See: Nonocclusal loading.

Immediate occlusal loading

A clinical protocol for the placement and applying force on dental implants, with a fixed or removable restoration in occlusal contact with the opposing dentition, at the same clinical visit.

See: Occlusal loading.

Immediate placement

See: Immediate implant placement.

Immediate provisionalization

A clinical protocol for the placement of an interim prosthesis with or without occlusal contact with the opposing dentition, at the same clinical visit.

Sugg: Immediate non-occlusal loading, Immediate occlusal loading.

Immediate restoration

See: Immediate provisionalization.

Immediate temporization

See: Immediate provisionalization.

Implant

A biocompatible alloplastic material or device that is surgically placed into orofacial tissues and used for anchorage, functional, therapeutic, and/or esthetic purposes.

Implant abutment

See: Abutment.

Implant-abutment interface

The surface where the dental implant and the prosthetic abutment connect.

See: Implant-abutment junction (IAJ).

Implant-abutment junction (IAJ)

Syn: Microgap (IAJ).

The external margin where the coronal aspect of a dental implant and its prosthetic abutment or restoration connect.

Implant analog

See: Analog/analogue.

Implant anchorage

Use of a dental implant as support for orthodontic tooth movement or arch expansion.

Implant apex

Portion of a root-form dental implant that first engages an osteotomy during its insertion. It may incorporate self-tapping characteristics.

**Implant-assisted prosthesis**

Any prosthesis that is completely or partly supported by an implant or implants.

Sugg: [Implant-supported prosthesis](#), [Implant-tissue-supported prosthesis](#).

See: [Cement-retained](#), [Fixed prosthesis](#), [Hybrid prosthesis](#), [Removable prosthesis](#), [Screw-retained](#).

Implant body

Syn: [Implant root](#), [Implant shaft](#). Portion of a root-form dental implant available for bone-to-implant contact.

Implant collar

The most coronal part of a dental implant, just apical to the edge of its platform, which can be of differing thickness and having the same surface treatment as the remaining portion of the implant or have a different surface finish specified by the manufacturer. Some root-form implants do not have a collar.

Implant component

One of the structural sections that make up the implant-abutment complex.

Implant-crown ratio

See: [Crown-implant ratio](#).

Implant dentistry

Syn: [Oral implantology](#), [Implant therapy](#).

The field of dentistry dealing with the diagnosis, surgical placement, prosthetic reconstruction, and maintenance of dental implants.

Implant diameter

The longest linear measurement in millimeters of the cross section of a dental implant.

Implant drill

Rotary cutting tool used for creating an osteotomy.

Implant exposure

1. A second surgical procedure after osseointegration has occurred accomplished with a soft tissue flap elevation or tissue punch when adequate keratinized tissue is available to access the coronal aspect of the implant to attach a healing abutment, or any variation of stock or custom transmucosal abutments.

2. Postoperative sequelae where an implant may not be completely covered with soft tissue resulting in a dehiscence.

See: [Exposure](#), [Stage-two surgery](#).

Implant failure

See: [Failed implant](#).

Implant fracture

The breakage of a dental implant into two or more parts.

Implant head

For subperiosteal or blade implants, refers to the segment of the implant above the neck and used to connect to the prosthetic reconstruction. Also called abutment.

Implant insertion

Mechanical act of delivering a dental implant into an osteotomy.

Implant installation

See: [Implant insertion](#), [Implant placement](#).

Implant interface

The area of contact between tissues (e.g., bone, connective tissue) and the surface of a dental implant.

Implant length

The measurement in millimeters of a two-piece implant in the corono-apical direction from the edge of the platform to its apex. For a one-piece implant, the measurement in millimeters in the corono-apical direction of the surface intended for osseointegration.

Implant-level impression

The impression of the implant platform using an implant impression coping.

See: [Abutment-level impression](#), [Closed-tray impression](#), [Open-tray impression](#).

Implant loading

See: [Loading](#).

Implant loss

See: [Failed implant](#).

Implant mobility

Clinically detectable motion of a dental implant.

See: [Macromotion](#), [Micromotion](#).

Implant mount

Device secured to the implant to facilitate the delivery of a dental implant to its prepared surgical osteotomy site, and can be used to rotate the implant to the pre-determined depth with the appropriate torque driver. The implant mount is then removed from the implant and the position confirmed.

Implant neck

Syn: [Cervix](#).

1. Root-form dental implant: The most coronal aspect of a dental implant.

2. Subperiosteal or blade implant: The transmucosal segment connecting the implant to the head or abutment.

**Implant overdenture**

See: [Overdenture \(implant\)](#).

Implant periapical lesion

Radiolucency localized at the apex of a root-form dental implant. It can be asymptomatic or symptomatic. The symptoms of the acute form may include a fistula with purulent exudate and/or pain on palpation.

Implant placement

Surgical steps involved in the drilling of the osteotomy and delivery of the implant into the bone either as a two-stage procedure where the implant will be covered with gingival tissues and allowed to integrate, or as a one-stage procedure with a transmucosal healing collar, with or without a soft tissue flap.

Implant prosthesis

Any prosthesis (fixed, removable, or maxillofacial) that utilizes dental implants in part or whole for retention, support, and stability.

Implant prosthodontics

Portion of implant dentistry dealing with the diagnosis, presurgical planning, construction, and placement of fixed or removable prostheses on any dental implant device.

Implant rejection

Failure of a dental implant to achieve osseointegration.

Implant-retained prosthesis

Sugg: [Implant-supported prosthesis](#), [Implant-tissue-supported prosthesis](#).

See: [Cement-retained](#), [Fixed prosthesis](#), [Hybrid prosthesis](#), [Removable prosthesis](#), [Screw-retained](#).

Implant root

Syn: [Implant body](#).

Implant scaler

Instrument used for plaque removal and debridement of the peri-implant sulcus. A variety of nonmetallic, plastic, graphite,

nylon, or teflon-coated instrument tips are recommended for titanium surfaces.

Implant selection

Process of choosing the type and size of a dental implant, based on site anatomy, surgical approach, and planned prosthetic reconstruction.

Implant shaft

See: [Implant body](#).

Implant shape

The macroscopic features of a dental implant such as thread design, if any, implant neck, body, and apex design.

Implant shoulder position

Obj See: [Crestal implant placement](#), [Subcrestal implant placement](#), [Supracrestal implant placement](#).

Implant site

Location in the maxilla or mandible where the placement of a dental implant is planned.

Implant splinting

See: [Splinting](#).

Implant stability

Clinical evaluation of the degree of fixation of a dental implant.

Implant stability quotient (ISQ)

ISQ – is a number (based on a scale from 1 to 100) which measures the lateral stability of the dental implant and thereby indirectly the degree of osseointegration achieved through linear mapping of resonance frequency analysis (RFA). While the actual values are expressed in Hertz, the ISQ number has been developed to facilitate communication regarding implant micromobility through a more user-friendly scale using implant-specific SmartPegs. ($ISQ \times 1,000 = RFA$ in Hz)

Implant success

Status of a dental implant based on predetermined success criteria.

See: [Implant survival](#), [Success rate](#).

Implant-supported prosthesis

A restoration that derives its entire support from dental implants. This type of restoration may be fixed or removable, partial or complete arch.

See: [Fixed prosthesis](#), [Overdenture \(implant\)](#), [Removable prosthesis](#).

Implant surface

See: [Surface characteristics \(implant\)](#).

**Implant surgery**

Portion of implant dentistry that concerns itself with the placement and exposure of implant devices.

Implant survival

Longevity of a dental implant within the oral cavity.

See: [Implant success](#).

Implant system

See: [System \(implant\)](#).

Implant therapy

See: [Implant dentistry](#).

Implant thread

See: [Thread](#).

Implant-tissue-supported prosthesis

An overdenture that derives its support from a combination of intraoral tissues and dental implants. This type of restoration is always removable and may be either partial or complete arch.

See: [Fixed prosthesis](#), [Removable prosthesis](#).

Implant try-in

See: [Trial-fit gauge](#).

Implant type

The classification of dental implants according to gross body geometry and mode of placement.



Implant uncovering

See: Stage-two surgery, Implant exposure.

Impression coping

A device that registers the position of a dental implant or dental implant abutment in an impression. It may be retained in the impression (direct) or may require a transfer from intraoral usage to the impression after the attachment of the corresponding analog (indirect).

Incision

A cut made in soft tissue.

See: Crestal incision, External bevel incision, Internal bevel incision, Mucobuccal fold incision, Paracrestal incision, Releasing incision, Sulcular incision.

Incisive foramen

One of several openings of the incisive canals into the incisive fossa.

Inclusion criteria

The specific characteristics that all participants must have to enter a clinical trial or study group.

See: Exclusion criteria.

Index

Mold used to record the relative position of a dental implant or tooth to its surroundings.

See: Buccal index.

Indirect impression

See: Closed-tray impression.

Indirect sinus graft

Sugg: Osteotome technique.

Individual suture

Sugg: Interrupted suture.

Infection

Invasion and multiplication of microorganisms in body tissues, which may be clinically inapparent or result in local cellular injury due to competitive metabolism, toxins, intracellular replication, or antigen-antibody response.

Inferior alveolar canal

See: Mandibular canal.

Inferior alveolar nerve (IAN)

One of the terminal branches of the mandibular nerve, a division of the trigeminal nerve. It enters the mandibular canal branching to the lower teeth, periosteum, and gingiva of the mandible. A branch, the mental nerve, passes through the mental foramen to supply the skin and mucosa of the lower lip and chin.

Inferior dental foramen

See: Mandibular foramen.

Inflammation

Localized reaction of the body tissues to invasion by pathogenic micro-organisms, or to trauma by wounds, burns or chemicals, which serves to destroy, dilute, or wall off both the injurious agent and the injured tissue. It may be acute or chronic and is characterized by

some or all five cardinal signs: redness, swelling, pain, a rise in temperature, and loss of function.

Informed consent

Written and oral explanation of the diagnosis and planned surgical / restorative procedures which describe the planned procedures so that patients can make an educated decision whether to undergo a procedure after knowing the risks and hazards. The clinician must tell a patient all of the potential benefits, risks, and treatment alternatives involved in any surgical or restorative procedure, or other course of treatment, and must obtain the patient's written consent to proceed. The informed consent document should then be part of the patient record.

Infra fracture

The controlled fracture of:

1. A window prepared in the lateral wall of the maxillary sinus.
2. The floor of the maxillary sinus through an osteotomy prepared in the ridge using an osteotome.

Infraorbital artery

A continuation of the internal maxillary artery, but often arises in conjunction with the posterior superior alveolar artery. While in the infraorbital canal, it gives off anterior superior alveolar branches which supply maxillary anterior teeth. It is one of the three primary arterial suppliers to the maxillary sinus.

See: Posterior lateral nasal artery, Posterior superior alveolar artery.

Infrastructure

The implants and/or teeth supporting a prosthetic reconstruction.

Initial stability

Syn: Primary stability.

The degree of tightness of a dental implant immediately after placement in its prepared osteotomy. An implant is considered to have initial stability if it is clinically immobile at time of placement.

Insertion torque

Syn: Placement torque.

The maximum torque recorded at the insertion of a dental implant in an osteotomy, expressed in Newton centimeters. It may be used as an indication of the mechanical stability of the implant in the bone.

Insulin-like growth factors (IGF)

Peptides that behave similarly to insulin and stimulate cell proliferation.

See: Platelet-rich plasma (PRP).

Interalveolar septum

Part of the alveolar process that separates individual alveoli.

See: Interradicular septum.

Interdental papilla

Portion of the free gingiva occupying the interproximal space confined by adjacent teeth in contact.

See: Papilla.

**Interim abutment**

See: Temporary abutment.

**Interim prosthesis/
restoration**

*Syn: Provisional prosthesis/
restoration*

A fixed or removable prosthesis, designed to restore and enhance esthetics, stabilization, and/or function for a limited period of time. It is used as a diagnostic tool to mimic the planned definitive prosthesis. It may be tissue-born, tooth-supported, implant-supported, or any combination thereof.

Interimplant distance

The horizontal distance between the platforms of two adjacent dental implants.

Interimplant papilla

The soft tissue occupying the interproximal space confined by adjacent implant-supported fixed partial dentures in contact.

See: Papilla.

**Interlock**

An intracoronal attachment used to segment a prosthetic reconstructions.

Intermaxillary relationship

See: maxillomandibular relationship.

Internal bevel incision

*Syn: Inverse bevel incision,
Inverted bevel incision, Reverse
bevel incision.*

Blade-cut, made in a coronal to apical direction, designed to reduce the thickness of gingiva

or periimplant mucosa from its internal surface (i.e., sulcular side).
See: External bevel incision.

Internal connection

A prosthetic connection interface internal to a dental implant platform. Examples include internal hexagon, conical, and Morse taper.

See: External connection.

Internal hexagon

A hexagonal connection interface of the platform of an implant within its coronal aspect providing abutment-to-implant anti-rotation necessary for prosthetic stability, and also to aid in the delivery and rotation of the implant within the osteotomy site.

Internal irrigation

Method of irrigation during the drilling of osteotomies for the placement of root-form dental implants, whereby the cooling solution passes inside the shaft of the drilling bur and

is delivered through an exit at the working end. This method delivers the cooling solution inside the osteotomy.

Internal sinus graft

*See: Osteotome technique,
Sinus graft.*

Internally threaded

Having a thread pattern within the body of a dental implant.

Interpositional graft

Placement of graft material within a 3, 4, or 5-walled bone compartment. Examples include the sinus graft, socket graft, and ridge expansion.

Interradicular septum

Part of the alveolar process that separates individual roots of the same tooth.

See: Interalveolar septum.

Interrupted suture

Suture made from a single tissue penetration of the flap(s).

See: Continuous suture.

Intrabony

See: Endosseous.

Intramucosal insert

See: Mucosal insert.

Intraoral digital X-ray sensor

See: Sensor (Digital X-ray)

Intraoral distraction

A distraction procedure in which the distraction device is located completely within the oral cavity.

**Intraoral (internal)
distraction device**

A device that is located inside the oral cavity, used in distraction osteogenesis. The device can be attached to the bone (bone-borne), to the teeth (tooth-borne), or simultaneously to the teeth and bone (hybrid).

Intraoral scanner

See: 3-D scanner, Parallel confocal imaging technology, Confocal microscopy, Digital impressions

**Intramembranous
ossification**

Bone formation in which connective tissue serving as a membrane becomes a template for bone deposition without any intermediate formation of cartilage.

Intraosseous

Syn: Endosseous.
Within the bone.

Intraosseous vessels

Vessels embedded in the bone, especially in the lateral wall of the maxillary sinus

**Intraosseous Anastomosis
(of the Lateral wall of the
Maxillary Sinus)**

Syn: endosseous anastomosis.
The lateral wall of the maxilla and the sinus membrane are supplied by the branches of the Posterior Superior Alveolar Artery (PSAA) and the Infraorbital Artery (IOA) which anastomose with each other on the lateral wall of the Maxillary

Sinus. The anastomosis can be intraosseous or extraosseous (vestibular). Intraosseous anastomosis is most commonly found in the first molar region with a distance of 15-19mm from the alveolar ridge. While existing in 100% of maxillas, it is only detectable in approximately 50% of cases using CBCT.

Intraosseous distractor

See: Endosseous distractor.

In vitro

Outside the living organism or natural system. Usually refers to artificial experimental systems such as cultures or cell-free extracts.

In vivo

Within the living organism or natural system.

Irrigation

1. Technique of using a solution, usually physiologic saline, to cool the surgical bur and flush away the surgical debris.
2. Act of flushing an area with a solution.

See: External irrigation, Internal irrigation.

Ischemia

Deficiency of blood in an area due to a functional constriction or actual obstruction of a blood vessel(s).

Isogeneic graft

See: Isograft.

Isograft

Syn: Isogeneic graft, Isologous graft, Syngeneic graft.

A tissue graft transplanted from one genetically identical individual to another, as in monozygotic twins.

Isologous graft

See: Isograft.

Isotropic surface

Surface textures that are randomly distributed so the surface is identical in all directions.

See: Anisotropic surface.

J

Jig

See: Orientation jig, Verification jig.

Joint-separating force

Force attempting to disengage parts joined by a screw.

Jumping distance

See: Gap distance.

Junctional epithelium

The epithelium adhering to the surface of a dental implant or tooth surface at the base of the sulcus. It constitutes the coronal part of the biologic width. It is formed by single or multiple layers of nonkeratinizing cells. The junctional epithelial cells have a basal membrane and hemidesmosomal attachments to the implant or tooth surface. *See: Epithelial attachment.*

K

Kaplan-Meier analysis

A statistical method used to estimate a population (e.g., dental implants) survival curve from a sample. Survival over time can be estimated, even when patients drop out or are studied for different lengths of time.

Keratinized gingival

Part of the oral mucosa covering the gingiva and hard palate. It extends from the free gingival margin to the mucogingival junction. It consists of the free gingiva and the attached gingiva.

Knife-edge ridge

Term used to describe a sharp or narrow morphology of a residual ridge in the mandible or maxilla usually a result of progressive resorption.

L

Labial plate

See: Buccal plate.

Laboratory analog

See: Analog/analogue.

Laboratory screw

Threaded component matching the abutment screw, used by the laboratory technician in the fabrication of the prosthetic reconstruction. Its use avoids the damage to the prosthetic screw which is reserved for the intraoral fixation of the prosthesis.

See: Prosthetic screw, Try-in screw.

Lamellar bone

See: Bone.

Lapping tool

Laboratory instrument used with a handpiece on the apical end of an abutment to remove the uneven surface produced during the casting process.

Laser

Acronym: Light amplification by stimulated emission of radiation. An optical device that transforms light of various set of frequencies into radiation energy (a beam) as a result of controlled stimulated emission. Certain properties are common such as monochromacy, coherence, and collimation.

Laser etching

Application of a laser beam to selectively ablate a material from a surface (e.g., dental implant).

Laser phototherapy (LPT)

The clinical use of nonionizing laser sources for non-surgical applications.

Laser welding

Technique of joining pieces of metal (e.g., a bar) through the use of a laser beam. The beam provides a concentrated heat source, allowing for high strength, narrow, and deep welds. *See: Fenestration*

Late implant failure

Syn: Secondary implant failure. The failure of a dental implant after osseointegration has been established. This type of failure may be due to or accompanied by peri-implantitis or overload. *See: Early implant failure.*

Latency period

See: Distraction osteogenesis (DO).

Lateral antrostomy

See: Lateral window technique, Sinus graft.

Lateral window technique

Syn: External sinus graft. The creation of access to the maxillary sinus through its lateral wall. The access is used to elevate the Schneiderian membrane for the placement of a graft material in the inferior part of the sinus space. *See: Fenestration*

Layered manufacturing

See: Solid freeform fabrication (SFF).

Leukocyte and Platelet Rich Fibrin (L-PRF)

A second generation autologous chairside preparation (platelet concentrate) derived from whole venous blood through a specific process of gradient density centrifugation that limits the degree of blood manipulation, and does not require a platelet activator. It produces dense fibrin matrix that incorporate leukocytes, platelets and high concentrations of growth factors. When compressed, the resulting fibrin matrix is strong, pliable, and can be sutured for use as a stand-alone product to improve wound healing and promote tissue regeneration. The resulting matrix can also be incorporated into particulate bone graft materials to improve handling characteristics of the particulate material.

Levofloxacin

Fluoroquinolone antibiotic with a broad spectrum of action, which may be used orally or parenterally. It is used in implant dentistry for severe infections, especially in the maxillary sinus.

Life table analysis

Statistical method to describe the survival (e.g., dental implants) in a sample. The distribution of survival times is divided into intervals. For each interval, one can compute the number and proportion of cases that entered the respective interval “alive”, the number and proportion of cases that failed in the respective interval (i.e., number of cases that “died”), and the number of cases that were lost to follow-up or censored in the respective interval.

Lingual

Relating to, near, or on the side toward the tongue. Often used to designate part of a tooth surface or position of an anatomical region.

Lingual artery

Branch of the carotid artery, with a distribution to the undersurface of the tongue, terminating as the deep artery of the tongue, and with subdivisions to the suprathyroid and dorsal lingual branches and the sublingual artery.

Lingual nerve

Branch of the mandibular division of the trigeminal nerve. It lies inferior to the lateral pterygoid and medial and anterior to the inferior alveolar nerve. It supplies sensory innervations to the mucous membrane of the anterior two thirds of the tongue and the gingiva on the lingual side of the mandibular teeth.

Lingual plate

Bony wall at the lingual aspect of an alveolus consisting of alveolar bone proper, cortical bone, with or without intervening cancellous bone.

Lining mucosa

See: Alveolar mucosa, Oral mucosa.

Lip-Lift

Placing a radiolucent object like a cotton roll under the lip during a CBCT scan to aid in diagnosing the thickness of facial or buccal cortical plate, soft tissue coverage, or post graft procedures, while defining the vestibule.

Lip Line

Defined as an imaginary line following the lower border of the upper lip when stretched due to smiling. Classified as High, Medium, and Low, the position of the lip is a reference to plan for esthetics and function during restorative treatment.

Lithium Disilicate

Glass ceramic substructure with approximately 70% lithium disilicate crystals. The surface may be veneered with traditional

M

feldspathic porcelains to provide a more esthetic appearance. Can be fabricated with a lost-wax process of pressing and also supplied in CAD/CAM blocks.

Load

Any external mechanical force applied to a prosthesis, dental implant, abutment, tooth, skeletal organ, or tissue.

Loading

Application of a force directly or indirectly onto a dental implant, tooth, or prosthesis.

Long buccal nerve

Branch of the mandibular division of the trigeminal nerve. It passes anteriorly between the heads of the lateral pterygoid muscle and descends inferiorly to the anterior border of the masseter muscle. It supplies the skin over the buccinator muscle as well as the mucous membrane lining its inner portion and the buccal gingiva of the mandibular molars.

Longitudinal study

A study in which observations on subjects are made at two or more points in time.

Lost-wax casting technique

The process of investing a wax or plastic pattern in a refractory mold which is placed into an oven at high heat to melt the pattern. The resulting void is then filled with molten metal, resulting in a casting.

Low energy laser therapy

Obj See: [Low level laser therapy \(LLLT\)](#).

Low intensity level laser therapy

See: [Low level laser therapy \(LLLT\)](#).

Low level laser therapy (LLLT)

Syn: [Low intensity level laser therapy](#), [Low power laser therapy](#). Type of laser treatment aimed at stimulating cell function. Its effects are not due to heat,

but thought to be mediated by a photochemical reaction that alters cell membrane permeability, leading to increased mRNA synthesis and cell proliferation.

Low power laser therapy

See: [Low level laser therapy \(LLLT\)](#).

Lyophilization

See: [Freeze-drying](#).

Machined implant surface

Syn: [Turned surface](#).

A dental implant surface that results from the milling process of a metallic rod. The scratches of the tooling on the implant form a machined pattern of lines and grooves.

See: [Surface characteristics \(implant\)](#), [Textured surface](#).

Macrointerlock

Fixation by mechanical interlocking between bone and dental implant macro-irregularities such as threads, holes, pores, grooves, etc., which have dimensions in the range of 50 microns or greater.

Macromotion

Excessive movement of a dental implant during its initial phase that may prevent bone healing sequence leading to osseointegration and result in fibrous tissue encapsulation.

Magnetic attachment

Non-mechanical retentive element mainly used for retention of overdentures, or for maxillofacial prosthetics dependent on the attraction properties of rare-earth alloys.

Maintenance

Procedures performed at selected time intervals to assist in the maintenance of the prosthetic reconstruction, periodontal and peri-implant tissue health.

Major (thread) diameter

The largest diameter of a screw thread. It corresponds to the diameter by which the screw is designated.

See: [Minor \(thread\) diameter](#).



Malpositioned implant

A dental implant placed in a position creating restorative, biomechanical, and/or esthetic challenges for an optimal restorative result.

Mandibular block graft

See: [Mandibular ramus graft](#), [Mandibular symphysis graft](#)

Mandibular canal

Syn: [Inferior alveolar canal](#).

The canal within the mandible that houses the inferior alveolar nerve and vessels. Its posterior opening is the mandibular foramen. Its anterior opening is the mental foramen.

Mandibular flexure

The medial deformation in the body of the mandible due to the contraction of the pterygoid muscles during opening and protrusion.

Mandibular foramen

The opening into the mandibular canal on the medial surface of the ramus of the mandible giving passage to the inferior alveolar nerve, artery, and vein.

Mandibular movement

Muscle and ligament activated border and/or intraborder movements of the lower jaw. The types of movements are, rotational, horizontal axis, frontal axis, sagittal axis, and translational.

Mandibular overdenture

See: Overdenture (implant).

Mandibular ramus

A quadrilateral process projecting upward and backward from the posterior part of the body of the mandible, and ending on the other end at the temporomandibular joint in a saddle-like indentation (sigmoid notch) between the coronoid and condylar processes. It may serve as a source for bone grafting.

Mandibular ramus graft

See: Ramus graft.

Mandibular staple implant

Syn: Transmandibular implant. Form of transosseous dental implant whereby a plate is fixed at the inferior border of the mandible. Retentive pins are placed partially into the inferior border with two continuous screws going trans cortically and penetrating into the mouth in the canine areas and used as abutments.



Mandibular symphysis

The line of fusion of the lateral halves of the body of the mandible, which splits inferiorly to form the mental protuberance. It may serve as a source for bone grafting.

Mandibular symphysis graft

See: Chin graft.

Mandibular torus

See: Torus.

Marginal peri-implant area

The mucosal peri-implant tissues and crestal bone.

Marking bur

Rotary cutting tool used to score the bone at the site of an osteotomy.

Master cast

The definitive stone or epoxy cast used by the dental laboratory technician for the fabrication of a prosthesis, or by the clinician with an in-house milling device.

Master impression

Using standard materials for a physical intra-oral impression to receive a negative likeness for the fabrication of a cast to fabricate a prosthetic restoration. Can also be achieved with an intra-oral scanner creating a virtual cast.

Mastication

The process by which food is crushed and ground by teeth. It is the first step of digestion, and it increases the surface area of foods to allow more efficient break down by enzymes. During the mastication or chewing process, the food is positioned by the cheek and tongue between the teeth for grinding.

Masticatory mucosa

Keratinized and attached oral mucosa of the gingiva and hard palate.

See: Oral mucosa.

Matrix

1. An intricate network of natural or synthetic fibers that aids in the reinforcement and development of tissues by supplying a scaffold on which cells may grow, migrate, and proliferate.
2. The female part of an attachment.

See: Attachment, Patrix.

Mattress suture

Suture made by a double penetration of the flap(s), not crossing over the incision line. It is aimed at holding together the deeper tissues in order to reduce the tension of a flap upon approximation. It may be done in a horizontal or vertical direction.

Maxilla

Two paired bones forming the upper jaw and palate of the mouth. The two halves are fused at the intermaxillary suture to form the upper jaw, containing the frontal, palatine, alveolar, and nasal processes.

Maxillary antroplasty

See: Sinus graft.

Maxillary antrum

See: Maxillary sinus.

Maxillary artery

A branch of the external carotid artery that arises behind the neck of the mandible. It passes forward between the mandibular ramus and the sphenomandibular ligament, towards the pterygopalatine fossa. It supplies the deep structures of the face, and may be divided into mandibular, pterygoid, and pterygopalatine portions.

See: Intraosseous Anastomosis (of the Lateral wall of the Maxillary Sinus).

Maxillary overdenture

See: Overdenture (implant).

Maxillary pseudocyst

A nonsecreting cyst within the maxillary sinus that is usually present on the sinus floor and is caused by accumulation of fluid between the sinus membrane and the sinus floor. It is not a true cyst because it lacks an epithelial lining.

See: Maxillary retention cyst.

Maxillary retention cyst

A secretion cyst, not usually seen radiographically, that is caused by blockage of the seromucinous gland duct. As secretions collect, they expand the duct, producing a cyst that is encompassed by respiratory or cuboidal epithelium. It may be located on the sinus floor, near the ostium, or within antral polyps. It may be caused by sinus infections, allergies, or odontogenic infections.

See: [Maxillary pseudocyst](#).

Maxillary rhino-sinusitis

A bacterial infection within the maxillary sinus with radiographic signs of an air-fluid level at its acute stage. Symptoms include purulent nasal discharge, nasal congestion, and facial pain. As condition progresses from acute to chronic, anaerobic bacteria become the predominant pathogens. It is considered chronic if it does not resolve in six weeks and/or becomes recurrent.

Maxillary sinus

Syn: [Antrum of Highmore](#), [Maxillary antrum](#).

Air cavity in the body of the maxilla that is lined by the Schneiderian membrane consisting of a pseudostratified ciliated columnar epithelium. It normally lies superior to the roots of the maxillary premolars and molars and generally extends anteroposteriorly from the canine or premolar region to the molar or tuberosity region. Anatomically, it is a pyramidal cavity, with thin bony walls corresponding to the orbital, alveolar (floor), facial, and infratemporal aspects of the maxilla. Its apex extends into the zygomatic process. Its base is medial, forming the lateral wall of the nasal cavity. It communicates with the nasal cavity through an opening in the middle meatus called the ostium. The floor is formed by the maxillary alveolar process and partly by the hard palate. The floor exhibits

recesses and depressions in the premolar and molar regions. Each sinus usually has a volume of about 15 milliliters.

See: [Alveolar recess](#), [Maxillary sinus septum](#).

Maxillary sinus aplasia

Developmental pathology characterized by the failure of the maxillary sinus to develop. It is diagnosed radiologically by an opaque maxillary antrum. It may be misdiagnosed as a sinusitis or a neoplasm.

Maxillary sinus augmentation

See: [Sinus graft](#).

Maxillary sinus floor

Syn: [Antral floor](#).

Inferior wall of the maxillary sinus, in relation with the maxillary roots of the molars and premolars, or the edentulous ridge.

Maxillary sinus floor elevation

See: [Sinus graft](#).

Maxillary sinus pneumatization

See: [Sinus pneumatization \(maxillary\)](#).

Maxillary sinus septum

Syn: [Underwood cleft or septum](#). Anatomic spine-like bony structure or web formation present in some maxillary sinuses. It may divide the inferior portion of the sinus into sections or loculi.

See: [Alveolar recess](#).

Maxillary sinus hypoplasia (MSH)

Developmental pathology characterized by the underdevelopment of the maxillary sinus. It is diagnosed radiologically by a centripetal opacification of the maxillary antrum. It may be congenital or a direct result from trauma, infection, surgical intervention, or irradiation of the maxilla during the development of the maxillary bone.

Maxillary sinusitis

See: [Sinusitis \(maxillary\)](#).

Maxillary torus

See: [Torus](#).

Maxillary tuberosity

The most distal aspect of the maxillary ridge, bilaterally. It may be used as a source of autogenous bone or serve for support of a prosthesis.

Maxillectomy

Complete surgical removal of the maxilla.

Maxillofacial prosthesis

Restoration replacing oral, stomatognathic, or craniofacial structures with a fixed or removable prosthesis. Support and retention can be provided by natural teeth, surrounding tissues, and/or endosseous implants.

Mean (arithmetic)

Measure of central tendency that is calculated by adding all the individual values in the group and dividing by the number of values in the group.

Mechanical failure

Fracture or deformation of an implant, an abutment, or a restorative component or material.

Median

Measure of central tendency. It is the middle score in a distribution or set of ranked scores. When the number of values in the sample is even, the median is computed as the average of the two middle values.

Medical-grade calcium sulfate (MGCS)

Bioengineered form of calcium sulfate, a bone substitute used for intraoral grafting procedures. The shape and size

of the hemihydrate crystals are modified to ensure a controlled and slower resorption profile.
See: [Calcium sulfate \(CaSO₄\)](#).

Medullary
Pertaining to the bone marrow.

Medullary bone
See: [Bone](#).

Megapascal (MPa)
A unit of pressure or stress equal to one million pascals. It is equivalent to 145 psi(lb/in²) or 9.87 kg/cm².

Membrane
See: [Barrier membrane](#), [Schneiderian membrane](#).

Membrane exposure
See: [Exposure](#).

Mental foramen
The anterior opening of the mandibular canal on the lateral aspect of the body of the mandible in the region of the first premolar, giving passage to the mental neurovascular bundle.

Mental nerve
Terminal branch of the inferior alveolar nerve, arising in the mandibular canal and passing through the mental foramen providing sensation to the chin and lower lip.

Mesenchymal stem cell (MSC)
Mesenchymal stem cells, or MSCs, are multipotent stromal cells that can differentiate into a variety of cell types, including: osteoblasts (bonecells), chondrocytes (cartilage cells), myocytes (muscle cells) and adipocytes (fat cells).

Mesostructure
The part a reconstruction, that couples the dental implant complex (infrastructure) to the superstructure.

Meta-analysis
A quantitative method of combining the results of independent studies meeting specified protocol criteria

(usually drawn from the published literature) and synthesizing summaries and conclusions that may be used to evaluate therapeutic effectiveness, and plan new studies.

Metal encapsulator
See: [Metal housing](#).

Metal housing
Syn: [Metal encapsulator](#). Part of an attachment mechanism incorporated in a removable prosthesis. The interchangeable retentive component is inserted in the metal housing and replaced when necessary.

Metal tap
See: [Tap](#).

Methylprednisolone
An intramuscular, intravenous, and oral glucocorticoid with an intermediate half-life.
See: [Glucocorticoid](#).

Metronidazole
An antibiotic (C₆H₉N₃O₃) used in the treatment of infections caused by susceptible organisms, particularly anaerobic bacteria and protozoa.

Microgap (IAJ)
See: [Implant-abutment junction \(IAJ\)](#).

Microinterlock
Fixation by mechanical interlocking of bone to micro-irregularities at textured dental implant surfaces, including those created by grit-blasting, coating, ion bombardment, which have dimensions in the range of less than ten microns.

Micromotion
Micromotion of dental implants has been defined as minimal displacement of an implant body relative to the surrounding tissue which cannot be recognized with the naked eye. It is the distance

the implant moves (measured in micrometers) when subjected to a lateral load (measured in Newtons). Excessive micromotion may interfere with the process of osseointegration of dental implants.

Midcrestal incision
An incision made in the middle of the crest of an edentulous ridge.

See: [Crestal incision](#), [Mucobuccal fold incision](#), [Paracrestal incision](#) (TAD).

Middle superior alveolar nerve
Branch of the infraorbital nerve arising at the infraorbital groove. It runs downwards and forward in the lateral wall of the sinus to supply the maxillary premolars.

Mid-palatal implant
See: [Palatal implant](#).

Mini-implant
A narrow diameter root-form dental implant which may be in one-piece or two-piece. It is used

for the support and/or retention of a provisional or definitive prosthesis.

See: [Transitional implant](#).



Miniscrew

Small titanium threaded implant used for temporary orthodontic anchorage via mechanical monocortical bone retention.

See: [Orthodontic implant](#), [Temporary anchorage device \(TAD\)](#).

Minor (thread) diameter
The smallest diameter of a screw thread.
See: [Major \(thread\) diameter](#).

Misfit
The imprecise or mismatching of two mating parts or components.

Mobility (implant)
See: [Implant mobility](#).

Mode

Score or value that occurs most frequently in a distribution.

Modeling (bone)

Independent sites of formation and resorption that result in the change of the shape or size of bone. It occurs during growth, and during healing.

Modulus of elasticity

Syn: Elastic modulus.
Ratio of stress over strain, when the deformation is elastic. It is a measure of stiffness or flexibility of a material. A stiff material has a high modulus of elasticity and a flexible material has a low modulus of elasticity. Also called Young's modulus.

Moment

The magnitude of force applied to a rotational system at a distance from the axis of rotation.

Monolithic zirconia (MZ)

Single crowns, bridges, and full-arch bridges are CAD CAM milled from a solid blocks of zirconia, which results in high strength restorations reducing chipping and breakage.

See: Zirconium (Zr), zirconium oxide.

Morse taper connection

An internal connection interface consisting of a converging circular surface, which forms a mechanical locking friction-fit. Also known as a cold weld.

Motion artifact

The acquisition time of state-of-the-art CBCT provides sufficient time for a human head to perform some minor movement, i.e. the action of swallowing. If an object moves during the scanning process, the computer reconstruction does not account

for that movement, therefore affecting the clarity and accuracy of the image.

See: Artifact, Scatter

Motion-sensing device (implant)

Tool evaluating the relative mobility of a dental implant in relation to its surrounding bone.

Motion tracking

Tracing the spatial position of moving objects relative to a reference coordinate system.

See: Handpiece motion tracker, Patient motion tracker.

Mount

See: Implant mount.

Mucobuccal fold incision

Syn: Vestibular incision.

An incision made in the mucobuccal fold.

See: Crestal incision, Midcrestal incision.

Mucocele (oral)

A swelling of connective tissue consisting of a collection of fluid called mucin. This occurs because of a ruptured salivary gland duct usually caused by local trauma (damage), in the case of mucus extravasation phenomenon, and an obstructed or ruptured salivary duct (parotid duct) in the case of a mucus retention cyst. Although the term cyst is often used to refer to these lesions, mucoceles are not strictly speaking true cysts because there is no epithelial lining. It would be more accurate to classify mucoceles as polyps (i.e. a lump).

Mucogingival junction

Demarcation between the masticatory mucosa and the alveolar mucosa.

Mucogingival surgery

Periodontal surgical procedure to correct defects in morphology, position, and/or amount

of gingiva. Performed to correct or eliminate anatomic, developmental, or traumatic deformities of the gingiva and alveolar mucosa.

See: Periodontal plastic surgery

Mucoperiosteal flap

See: Full-thickness flap.

Mucoperiosteum

Layer of periosteum, connective tissue and epithelium that covers bone of the maxilla and mandible.

Mucosa

The epithelial lining of body cavities opening to the outside, consisting of a mucous membrane.

See: Oral mucosa.

Mucosal implant

See: Mucosal insert.

Mucosal insert

Syn: Button implant, Epithelial implant, Intramucosal insert, Mucosal implant.

Mushroom-shaped device

fastened to the tissue surface of a removable denture that fits within a prepared gingival receptor site. The use of multiple mucosal inserts enhances a denture's retention and stability.

Mucosal peri-implant tissues

The soft tissues (epithelium and connective tissues) surrounding the exposed portion of a dental implant.

Mucous retention cyst

A cyst caused by an obstruction of a duct, usually belonging to the parotid gland or a minor salivary gland

Mucosal-supported surgical guide / template

See: Surgical guide, Surgical template.

Mucositis

Inflammation of the mucosa.
See: Peri-implant mucositis.

N

Multi axis machines

The most advanced CNC milling-machines can add two or more axes in addition to the three normal axes (XYZ). Horizontal milling machines also have a C or Q axis, allowing the horizontally mounted work piece to be rotated, essentially allowing asymmetric and eccentric turning. The fifth axis (B axis) controls the tilt of the tool itself. When all of these axes are used in conjunction with each other, extremely complicated geometries, such as CAD CAM abutments or monolithic full arch zirconia restoration can be milled with these machines.

See: [CAD/CAM](#), [CNC milling \(CNC\)](#).

Multicenter study

A clinical trial conducted according to a single protocol, but at more than one research center, and therefore, carried-out by a group of investigators.

Multi-unit abutment

Designed for screw-retained

restorations of partially edentulous and edentulous arches, available in straight and angulated options with a range of collar heights to match the vertical thickness of the soft tissue.
See: [Abutment](#), [Angulated abutment](#).

Mylohyoid ridge

Horizontal bony extension on the lingual aspect of the mandibular premolars and molars that is an attachment for the mylohyoid muscle which forms the floor of the mouth.

Narrow Ridge Implant (NRI)

Plate form, 2nd stage implant for narrow ridge cases.

Nasopalatine nerve

A branch from the pterygopalatine ganglion that passes through the sphenopalatine foramen, across the roof of the nasal cavity to the nasal septum, and obliquely downward to and through the incisive canal. It innervates the anterior part of the hard palate and the mucosa of the nasal septum.

Natural tooth intrusion

Apical movement of a tooth produced by an external force or trauma. Phenomenon reported in the dental literature when splinting natural teeth to a dental implant with a fixed prosthesis.

Navigation

See: [Navigation surgery](#).

Navigation surgery

Syn: [Computer-aided navigation](#), [Implant guided surgery](#), [Navigation](#), [Surgical navigation](#).
A distinct surgical modality in which the intraoperative localization of the surgical instrument is fed back visually onscreen in reference to the preoperative diagnostic imaging of the patient by employing patient registration algorithms and motion tracking technology. In implant dentistry, the implant drilling and placement are guided by imaging displaying real-time reconstruction of the intraoperative localization of the dental drill relative to the pre-acquired CT imaging of the anatomic structures. The dental drill is piloted according to a preplanned drilling-path or implant position by means of onscreen direction indicators.
See: [Registration](#)

Nd:YAG laser

Abbr: Neodymium-doped yttrium aluminum garnet laser.
A solid-state laser containing a Nd:YAG crystal which emits at a wavelength of 1064 nanometers. It is mainly used in soft tissue surgery.

Necrosis

Death of cells and tissues due to loss of blood supply, bacterial toxins, or physical and chemical agents.

Neoplasm

Abnormal tissue mass that when malignant could metastasize locally or systemically.

Nerve lateralization

Syn: [Nerve repositioning](#).

Nerve repositioning

Syn: [Nerve lateralization](#), [Nerve transpositioning](#).
Surgical procedure whereby the course of the inferior alveolar nerve is redirected to allow the

placement of longer implants in a mandible with extensive resorption of the posterior ridge.

Nerve transpositioning

See: [Nerve repositioning](#).

Neurapraxia

Mild nerve injury caused by compression or retraction. There is no violation of the nerve trunk and no axonal degeneration. Spontaneous recovery of the motor and/or sensory functions most often occurs within one to four weeks from the time of injury.

Neurotmesis

Nerve injury involving a complete severance of the nerve trunk, leading to Wallerian degeneration. Sensory and/or motor functions are impaired. The potential for recovery is remote. In implant dentistry, this may be caused by an incision of the nerve or any of the factors leading to axonotmesis.

Newton (N)

Unit of force. It is equal to the amount of force required to give a mass of one kilogram an acceleration of one meter per second squared.

Newton centimeters (Ncm)

Unit of rotational torque.

Nightguard

See: Occlusal guard.

Nominal implant length/diameter

The length or diameter of a dental implant as written on the manufacturer's label.

See: Actual implant length/diameter.

Nonabsorbable

The property exhibited by non-autogenous substances that demonstrate no in vivo degradation over time.

See: Nonresorbable.

Nonangled abutment

See: Nonangulated abutment.

Nonangulated abutment

Syn: Nonangled abutment, Straight abutment.

Abutment with a body parallel to the long axis of the dental implant.

Nonaxial loading

Refers to forces applied to a dental implant off its long-axis.

Nonengaging

Feature of a dental implant or prosthetic component that does not incorporate an anti-rotation mechanical design.

Nonfunctional loading

See: Nonocclusal loading.

Nonhexed

A component or a dental implant without a hexagonal connection interface.

Nonlamellar bone

See: Bone.

Nonocclusal loading

The restoration is not in occlusal contact with the opposing dentition in maximal intercuspal position or in excursions. However, the cheeks, tongue, lips, and food, may touch the restoration.

Nonresorbable

Materials that do not degrade in vivo.

See: Nonabsorbable.

Nonresorbable membrane

A material that does not breakdown in the oral cavity such as expanded polytetrafluoroethylene (e-PTF), therefore requiring a second procedure to remove it from the site.

Nonsteroidal anti-inflammatory drug (NSAID)

Class of medication with analgesic (nonopioid), antipyretic, and antiinflammatory effects. Its mechanism of action involves the inhibition of the synthesis of prostaglandins from arachidonic acid.

Nonsubmerged implant

One-stage implant placement procedure incorporating a transmucosal component to assist soft tissue healing, and obviate the need for a second surgical procedure.

Nonsubmergeble implant

See: One-stage implant.

Nonthreaded implant

A dental implant without external threads on its body and neck.

Nonworking side

Segment of the dental arch that is opposite the side where teeth occlude during mandibular movement.

**Oblique slice**

See: Cross-sectional slice.

Occlusal adjustment

Modification of the biting surfaces of a tooth, or teeth to improve function or morphology.

Occlusal guard

Removable appliance designed to minimize the damaging effects of bruxism and other deleterious occlusal habits to dental implants, natural dentition, and prosthetic reconstructions.

Occlusal loading

The restoration is in occlusal contact with the opposing dentition in maximal intercuspal position and/or excursions.

Occlusal overload

See: Overload (occlusal).

Occlusive membrane

See: Barrier membrane.

Occlusal table

Collective surface anatomy of the posterior teeth inclusive of molar and premolar cusps, inclined planes, marginal ridges, grooves, and fossae.

One-part implant

A dental implant in which the endosseous and transmucosal portions consist of one unit which presents a surface without a joint (microgap) to the tissues.

One-piece abutment

An abutment that connects into a dental implant without the use of an additional retaining screw. The abutment can be retained by cement, friction, or screw threads.

One-piece implant

A dental implant in which the endosseous and abutment portions consist of one unit.

One-screw test

A test used to check the fit of a multiple unit screw-retained restoration. One screw is placed in the terminal dental implant abutment. Evaluation is made on the opposite side. If the framework rises or has a ledge, detected clinically or radiologically, the fit is considered inaccurate.

One-stage grafting procedures

Simultaneous implant placement where primary stability is achieved, followed immediately by grafting procedures to fill the remaining defect and/or support the soft tissue.

One-stage implant

Syn: Nonsubmergible implant, Single-stage implant.

An endosseous dental implant designed to be placed following a one-stage surgery protocol.

The implant is designed with a transmucosal coronal portion. Usually the transmucosal portion and the implant are one piece with no microgap.

**One-stage surgery**

A surgical protocol consisting of placing an endosseous root-form dental implant in bone and leaving it in contact with the oral environment during the healing process, thus eliminating a second surgical procedure.

Onlay graft

Augmentation by placing autogenous bone and/or a bone replacement graft on or over bone to increase height and/or width of the ridge.

Open-ended wrench

Instrument used to apply a torque during removal of an implant mount.

Open-tray impression

Syn: Direct impression.

Impression technique that uses an impression coping with retentive features around which a rigid elastic impression material is injected. To remove the impression, the impression coping is first unthreaded through an opening on the occlusal surface of the tray.

Opioid

Morphine-like centrally acting analgesic, the primary medication used to treat moderate to severe pain.

Optical surface scan

An optical surface scan is obtained by scanning a stone model, or impression with a 3D scanner or by scanning the occlusal surface of the teeth with a 3D intraoral camera, creating a digital file to be utilized with computer software for CAD CAM applications in dentistry.

The digital STL file can then be merged with a CT / CBCT to aid in the diagnosis, treatment planning, and surgical guide fabrication when required.

See: Dual Scan Protocol, Standard Tessellation Language or Standard Triangulation Language (STL), Intraoral scanner, Digital impressions.

Oral implantology

See: Implant dentistry.

Oral mucosa

Epithelial lining of the oral cavity continuous with the skin of the lips and mucosa of the soft palate and pharynx. The oral mucosa consists of:

1. Masticatory mucosa: Mucosa of the gingiva and hard palate.
2. Specialized mucosa: Mucosa of the dorsum of the tongue.
3. Lining mucosa: *Syn: Alveolar mucosa.* The remaining mucosa of the oral cavity.

Orientation jig

A laboratory fabricated device, used to maintain the correct positional relationship of a component when transferring it from the cast to the mouth.

O-ring

Doughnut-shaped, resilient overdenture attachment that possesses the ability to bend with resistance and return to its approximate original shape. It attaches to a post with a groove or undercut area.

See: Ball attachment.

**Oro-antral fistula**

A communication between the maxillary sinus and the oral cavity with an epithelialized tract.

Orthodontic implant

Any implant used during orthodontic treatment as anchorage for orthodontic tooth movement.

See: Temporary anchorage device (TAD).

Orthopantograph

See: Panoramic radiograph.

Osse(o)

Syn: Osteo.

Pertaining to bone or containing a bony element.

Osseointegration

The direct contact between living bone and a functionally loaded dental implant surface without interposed soft tissue at the light microscope level. The clinical manifestation of osseointegration is absence of mobility.

Osseous

Bony.

Osseous coagulum

Mixture of small autogenous bone particles and blood collected during surgery.

Osseous graft

See: Bone graft.

Osseous integration

See: Osseointegration.

Ossification

1. The formation of bone or of a bony substance.
2. The conversion of fibrous tissue or of cartilage into bone or a bony substance.

See: Intramembranous ossification.

Osteal

Bony, osseous.

Osteectomy

Excision of bone.

See: Osteoplasty.

Osteoblast

A fully differentiated cell that functions in the formation of bone tissue. Osteoblasts synthesize the collagen and glycoproteins that form the bone matrix, and also produce inorganic salts. With growth, they develop into osteocytes.

Osteocalcin

A bone-specific protein that is produced by the osteoblast and may play a role in osteoclast recruitment. It is a marker for bone remodeling or mineralization.

Osteoclast

Large multinucleated cell, arising from mononuclear precursors of hematopoietic lineage, that functions in the resorption of osseous tissue.

Osteoconduction

Bone growth by apposition from the surrounding bone. Process by which a material provides scaffolding along which bone growth can occur.

See: Osteoinduction.

Osteocyte

An osteoblast that has become embedded within bone matrix, occupying a flat oval cavity (bone lacuna). Cells found in bone lacunae send, through canaliculi,

slender cytoplasmic processes that make contact with processes of other osteocytes and osteoblasts.

Osteodistraction

See: Distraction osteogenesis (DO).

Osteogenesis

The formation and development of bone.

Osteogenetic

1. Forming bone.
2. Concerned in bone formation.

Osteogenic

Syn: Osteogenous.

Promoting the development and formation of bone, exclusively resulting from the action of osteoblasts.

Osteogenous

See: Osteogenic.

Osteoid

1. Resembling bone.
2. The non-mineralized bone matrix laid down by osteoblasts. It is later calcified, with the inclusion of osteoblasts as osteocytes within lacunae, in bone.

Osteoinduction

The induction of bone formation. New bone formation occurs from osteoprogenitor cells derived from primitive mesenchymal cells under the influence of one or more agents that emanate from bone matrix, or select bone allografts, or genetically engineered materials.

See: Bone morphogenetic protein (BMP), Osteoconduction.

Osteointegration

See: Osseointegration.

Osteology

The scientific study of bones.

Osteolysis

Bone resorption and dissolution, involving the loss or removal of calcium, as part of an ongoing disease process.

Osteomyelitis

Inflammation of bone caused by infection. It may remain localized or spread through bone to involve marrow, cortex, cancellous tissue, and periosteum.

Osteon

The basic unit of structure of compact bone, comprising a Haversian canal and its concentrically arranged lamellae, of which there may be 4 to 20, each 3 to 7 microns thick, in a single (Haversian) system. Such units are mainly directed in the long axis of the bone.

Osteonecrosis

Syn: Bone necrosis.

The death or necrosis of bone due to the obstruction of its blood supply.

See: Bisphosphonate-related osteonecrosis of the jaw (BRONJ), Osteonecrosis of the jaw (ONJ).

Osteonecrosis of the jaw (ONJ)

Exposed bone in the mandible, maxilla or both that persists for at least 8 weeks, in the absence of previous radiation and of metastases in the jaws.

See: Bisphosphonate-related osteonecrosis of the jaw (BRONJ), Osteonecrosis.

Osteonectin

A phosphoprotein, found in bone and blood platelets, which binds both collagen and calcium and serves as a regulator of mineralization.

P

Osteopenia

Reduced bone “mass” due to a decrease in the rate of osteoid synthesis to a level insufficient to compensate for normal bone lysis. It is considered a serious risk factor for the development of osteoporosis.

Osteoplasty

A surgical procedure to modify bone anatomy by selective removal.

See: [Osteotomy](#).

Osteopontin

An acidic calcium-binding phosphoprotein with a high affinity for hydroxyapatite, involved in bone mineralization.

Osteoporosis

Disease of bone metabolism characterized by a decreased bone “mass” and increased microarchitectural deterioration, leading to a greater susceptibility to bone fracture. Diagnosis

is made by dual-energy x-ray absorptiometry (DXA) which measures bone mineral ‘density’ at multiple skeletal sites.

Osteoprogenitor cell

An undifferentiated cell that possesses the ability to transform into an osteoblast.

Osteopromotion

Use of physical means (e.g., barrier membrane) to seal off an anatomical site in order to promote bone formation and prevent soft tissue invasion, notably connective tissue, that could interfere with osteogenesis.

Osteoradionecrosis

Bone necrosis caused by excessive exposure to radiation.

Osteotome

An instrument, circular in cross-section, used to expand a dental implant osteotomy apically and/or laterally, with or without grafting.

Osteotome lift

See: [Osteotome technique](#).

Osteotome technique

1. Syn: Internal sinus graft. A sinus grafting technique whereby the maxillary sinus floor is carefully infracted and the Schneiderian membrane is elevated through an osteotomy prepared and extended in the ridge with an osteotome.
2. The surgical expansion of an osteotomy laterally with or without grafting.

See: [Ridge expansion](#).

Osteotomy

A site prepared in bone for the placement of a dental implant or graft. Any surgical procedure in which bone is transected or cut.

See: [Pilot osteotomy](#).

Ostium (maxillary sinus)

An opening which connects the maxillary sinus to the middle meatus of the nasal cavity

Overdenture (implant)

Removable partial or complete denture, which may be implant-supported, or implant-tissue-supported. The prosthesis is retained by attachments.

Overload (occlusal)

Situation in which the masticatory forces applied to a dental implant exceeds the capacity of the bone-implant interface, implant, or componentry to withstand it.

Oxidized surface treatment

Modification of the surface properties of titanium dental implants by alteration of the titanium oxide layer thickness.

Oxycodone

Semisynthetic opioid analgesic, recommended for moderate to severe pain. It may be used as a single agent or combined with products such as acetaminophen, aspirin, or ibuprofen.

Oxygen therapy

See: [Hyperbaric oxygen therapy \(HBOT\)](#).

PACS

Abbr: Picture archiving and communication system.

A medical imaging technology which provides economical storage of, and convenient access to, images from multiple modalities.

Palatal graft

See: [free gingival graft](#).

Palatal implant

Dental implant placed in the mid-sagittal area of the maxillary hard palate for use as anchorage in orthodontic treatment.

See: [Orthodontic implant](#), [Temporary anchorage device \(TAD\)](#).

Palatal vault

Superior surface of the hard palate.

Pamidronate

Intravenous nitrogen-containing bisphosphonate used for the treatment of osteoporosis, Paget's disease, and certain cancers affecting bone (e.g.,

multiple myeloma). Its mechanism of action involves the inhibition of osteoclast migration and maturation.

Panoramic radiograph

A single radiographic view of the maxilla and mandible extending from the left to the right glenoid fossae.

Panoramic reconstitution

See: Panoramic reconstruction.

Panoramic reconstruction

A thin, reformatted section of computed tomography scan data parallel to and following the curvature of the alveolar process as seen in the axial view.

See: Axial slice, Cross-sectional slice.

Papilla

Soft tissue occupying the interproximal space confined by adjacent crowns in contact.

See: Interdental papilla, Interimplant papilla.



Papilla preservation

Surgical and prosthetic measures taken to maintain and/or reduce trauma to the interproximal tissue.

Papilla-preservation flap

See: Papilla-sparing incision.

Papilla reformation

The spontaneous reformation of the interproximal papilla following the establishment of a contact point and the management of the interproximal prosthetic papillary space. Also, the re-establishment of the lost interproximal papilla by surgical means.

Papilla regeneration

See: Papilla reformation.

Papilla-sparing incision

Para-sulcular incision design excluding the papilla in flap elevation.

Paracrestal incision

A crestal incision made away from the middle of the crest of an edentulous ridge, either buccally or lingually.

See: Crestal incision, Midcrestal incision, Mucobuccal fold incision.

Parallel confocal imaging technology

Confocal is a principle by which light is filtered by passing it through a small pinhole. Only the light reflected from the object at the proper focal distance will pass through the pinhole. Therefore, only those rays that are in focus will return through the filtering device. Certain intra-oral scanners expand upon this concept by simultaneously projecting 100,000 beams of parallel red light rays with each individual scan.

See: Intraoral scanner, Confocal microscopy.

Parallel(ing) pin

See: Direction indicator.

Parallel-sided implant

Syn: Parallel-walled implant, Straight implant.

An endosseous, root-form dental implant, with the body of the implant having the same diameter at the coronal and apical ends. The coronal diameter does not necessarily match that of the platform, which may be of a larger diameter.

Parallel-walled implant

See: Parallel-sided implant.

Paresthesia

Spontaneous or evoked abnormal sensations that are not painful but may be unpleasant, such as tingling, burning, prickling, or numbness. It is usually caused by nerve injury and is sometimes a consequence of surgical procedures.

Partial anodontia

Obj See: Partially edentulous.

Partially edentulous

State where one or more teeth are missing, but not all.

See: Edentulous.

Partial thickness flap

Syn: Split-thickness flap.

A flap resulting from the elevation of epithelium and some connective tissue but not the periosteum, which is left on the bone.

Particulate graft

Variable pore and particle sized autograft, allograft, alloplast, or xenograft, all having different resorption/substitution rates.

Passivation

A process by which metals and alloys are made more resistant to corrosion through treatment to produce a thin and stable oxide layer on the external surfaces.

Passive fit

Adaptation of a prosthetic reconstruction that does not induce strain between two or more supporting elements.

Patient motion tracker

An array of active emitters or passive reflectors that are attached to a patient to enable their localization within the operative field by an overhead detector.

Patient-specific abutment

See: Custom abutment.

Patrix

The male part of an attachment.

See: Attachment, Matrix.

Pedicle graft

Full or partial thickness flap reflected from an area with a base attached to the donor site and in which the free margin is moved. It may be laterally or coronally positioned or rotated to cover an adjacent surgical site or enhance the soft tissue contours.

See: Full-thickness flap, Partial thickness flap.

Penicillin

Any of a large group of natural or semisynthetic antibacterial antibiotics derived directly or indirectly from strains of fungi of the genus *Penicillium* and other soil-inhabiting fungi grown on special culture media.

They exert a bactericidal as well as bacteriostatic effect on susceptible bacteria by interfering with the final stages of the synthesis of peptidoglycans, a substance in the bacterial cell wall. They can be classified according to their differing antibacterial spectrum: penicillin G and

congeners (penicillin C), anti-staphylococcal penicillins (methicillin, dicloxacillin), extended spectrum penicillins (ampicillin and amoxicillin), and

extended spectrum penicillins with beta-lactamase inhibitors (amoxicillin and clavulanate, ampicillin and sulbactam).

See: Amoxicillin, Clavulanic acid.

Percentage bone-to-implant contact

The linear surface of a dental implant in direct contact with the bone, expressed as percentage of the total implant surface.

See: Bone-to-implant contact (BIC).

Percutaneous implant

Used for the treatment of maxillofacial defects with implants placed extraorally within the bone and through the skin to support maxillofacial prosthesis.

Perforation

Cortical: A hole created in the cortical bone by a drill or implant.

See: Decortication.

Schneiderian membrane: Tearing or creation of an opening in the maxillary sinus membrane during sinus graft surgery, following tooth extraction, or during the preparation of an osteotomy for dental implant placement.

Periabutment

Around the abutment.

Pericervical saucerization

Syn: Craterization.

Pathologic crestal bone loss due to peri-implantitis. Radiographically, the bone loss is cup-shaped or saucer-like around the coronal aspect of the dental implant.

See: Peri-implantitis.

Peri-implant

Around the implant.

Peri-implant crevicular epithelium

Nonkeratinized epithelium lining the mucosal crevice.

Peri-implant disease

Collective term for inflammatory reactions in the soft and/or hard tissues surrounding dental implants.

See: Peri-implantitis, Peri-implant mucositis.

Peri-implantitis

Term for inflammatory reactions in the hard and soft tissues, with loss of supporting bone, surrounding a dental implant exposed to the oral environment.

Peri-implant mucositis

Reversible inflammatory reactions in the soft tissues surrounding a dental implant exposed to the oral environment, with no bone loss.

Peri-implant soft tissue

See: Mucosal peri-implant tissues.

Periodontal biotype

Expression relating the morphology of the periodontium to tooth form.

Two categories exist.

1. Thick flat gingival (periodontal) biotype: the buccal marginal gingival is comparatively thick, the papillae are usually short, the bone of the buccal cortical wall is thick, and the vertical distance between the interdental bone crest and the buccal bone is short (about two

millimeters). The clinical crowns of teeth are usually short and square, and roots are wide and short.

2. Thin scalloped gingival (periodontal) biotype: the buccal marginal gingival is delicate and may often be located apical of the cemento-enamel junction (receded), the papillae are high and slender, the buccal bone wall is often thin and the vertical distance between the interdental bone crest and the buccal bone is long (> four millimeters).

The clinical crowns of teeth are usually long and tapered, and roots are narrow and long.

Periodontal disease

Periodontal diseases describe pathologic processes that can affect one or more of the periodontal tissues/ structures (e.g. alveolar bone, periodontal ligament, cementum and gingiva). While there are many different periodontal diseases that can affect the tooth-supporting tissues/structures,

by far the most common ones are plaque-induced inflammatory conditions, such as gingivitis and periodontitis. Periodontal disease ranges from the mildest stage, known as gingivitis, to severe stage, known as periodontitis.

Periodontal ligament (PDL)

A group of specialized connective tissue fibers that essentially attach a tooth, and root cementum to the surrounding alveolar bone providing absorption, mobility and force distribution during mastication.

Periodontal membrane

See: Periodontal ligament (PDL).

Periodontal plastic surgery

Procedures that correct or eliminate anatomic, developmental, or traumatic deformities of the gingiva or alveolar mucosa.

See: Mucogingival surgery.

Periodontal probe

A manual instrument which is calibrated in millimeters used to measure the gingival sulcus or pocket depths around a tooth or an implant during routine periodontal or peri-implant clinical examination.

Perosteal

Pertaining to the periosteum.

Perosteal release

Act of severing periosteal fibers to enhance the mobility of a flap.

Perosteal suture

Suturing technique involving the immobilization of a partial thickness flap, a soft tissue graft, or a membrane by utilizing the subjacent and/or adjacent periosteum.

Perosteum

The layer of fibrous connective tissue and osteoblasts, which covers all bone surfaces except at the articular surfaces.

Periotome

Instrument used to sever the periodontal ligament fibers prior to tooth extraction.

Permucosal

Through the mucosa.

Permucosal extension

See: Healing abutment.

Permucosal seal

Junctional epithelium that separates the connective tissues from the outside environment around a dental implant.

See: Junctional epithelium.

Pick-up impression

To insure accuracy of fit and the master cast, the prosthetic framework which is seated onto the implants or abutments is impressed, and then becomes embedded into the impression.

The same process can occur to fabricate a master cast when the framework has been sectioned and soldered.

See: solder index, Master cast.

Piezoelectric bone surgery

Surgical technique using an ultrasonic device operating at a modulated frequency that is designed to cut or grind bone but not damage the adjacent soft tissues.

Pilot drill

The initial drill used to enlarge the coronal aspect of a dental implant osteotomy, thereby directing the path of the subsequent drill.

Pilot guide

A surgical template which may have an embedded metal cylinder to help position the initial drill to start the osteotomy process, thereby directing the path for subsequent drills.

See: Pilot drill, template-assisted, Surgical guide.

Pilot osteotomy

The initial penetration in the bone by several millimeters with a drill in the sequence of preparing an osteotomy for dental implant placement.

Pinhole Surgical Technique

The Chao Pinhole® Surgical Technique is a minimally invasive way to repair gum shrinkage through a pinhole in the gingiva using special instrumentation that does not require cutting, stitches, or second surgical site.

Placement torque

See: Insertion torque.

Plaque

A biofilm or mass of bacteria that adheres to surfaces within the mouth.

Plasma Rich in Grown Factors (PRGF)

A second generation autologous chairside preparation derived from whole venous blood through a specific process of gradient density centrifugation.

After careful pipetting and activation with calcium chloride, the protocol yields a fibrin membrane of elastic consistency containing platelets and high concentrations of growth factors, yet free from inflammatory leukocytes. The membranes can be used as a standalone product to improve wound healing and promote tissue regeneration.

Plasma spray

A surface treatment involving high temperature deposition of metal or ceramic powders that are totally or partially melted and then rapidly resolidified, forming a dense or porous coating.

Plaster of Paris

See: Calcium sulfate (CaSO₄).

Platelet-derived growth factors (PDGF)

Growth factors released by platelets that initiate connective tissue healing including bone regeneration and repair. They also increase mitogenesis, angiogenesis, and macrophage activation.

Platelet gel

A concentrate of platelets derived from a patient's blood and mixed with calcium and thrombin to form a gel which may be used during surgery.

Platelet-poor plasma (PPP)

Refers to a lesser concentration of active platelets that remain from the separation process in which the formation of platelet-rich plasma is derived.

Platelet-rich gel

See: Platelet-rich plasma (PRP).

Platelet-rich plasma (PRP)

A second generation autologous chairside preparation derived from whole venous blood through a specific process of gradient density centrifugation. After careful pipetting and activation with calcium chloride, the protocol yields a fibrin membrane of elastic consistency containing platelets and high concentrations of growth factors, (PDGF, TGF- β 1, TGF- β 2, IGF, VEGF, FGF-1, and fibrin when added to a graft mixture), yet free from inflammatory leukocytes. The membranes can be used as a stand-alone product to improve wound healing and promote tissue regeneration.

Platform

Refers to the coronal aspect of a dental implant to which abutments, components, and prostheses may be connected. *See: Platform edge.*

Platform edge

The junction line between the body of a dental implant and its platform. The localization of the edge of the platform in relationship to the bone crest determines a crestal, subcrestal, or supracrestal positioning of the implant. The edge of the platform and the implant abutment junction may or may not coincide.

See: Implant-abutment junction (IAJ), Platform switching.

Platform shifting

See: Platform switching.

Platform swapping

See: Platform switching.

Platform switching

Syn: Abutment swapping.

The use of an abutment with a diameter narrower than that of the dental implant platform. This switching moves the implant-abutment junction away from the edge of the platform.

Pneumatization

Physiologic process that occurs in all paranasal sinuses during the growth period, causing them to increase in volume.

See: Sinus pneumatization (maxillary).

Polished surface

A machined surface that is made smoother.

Polishing cap

Component connected to the apical part of an abutment to protect the base and allow the laboratory technician to polish the prosthesis and abutment without over-reducing the base diameter or rounding the edges.

Polyglactin

A type of multifilament braided material made of purified lactides and glycolides used to fabricate absorbable sutures or membranes.

Polyglycolic acid (PGA)

A polymer of glycolic acid used to fabricate absorbable sutures or membranes.

Polylactic acid (PLA)

A polymer of lactic acid used to fabricate absorbable sutures or membranes.

Polymethylmethacrylate (PMMA)

Synthetic polymer of methyl methacrylate, used as bone cement with an in situ polymerization.

Polytetrafluoroethylene (PTFE)

A synthetic polymer that is non-resorbable, biologically inert and chemically non-reactive, and therefore an ideal material for many medical device applications. It has been used for guided tissue regeneration (GTR) as a barrier membrane.

See: Expanded polytetrafluoroethylene (ePTFE), Dense PTFE (dPTFE).

Porcelain-fused-metal restoration

See: ceramometal restoration.

Porous

Characterized by the presence of pores or voids within a structure (e.g., grafting material, dental implant surface).

Porous surface

See: Plasma spray, Sintered (porous) surface.

Positioned flap

A flap that is moved apically, coronally, or laterally to a new position.

Posterior lateral nasal artery

Branch of the sphenopalatine artery which is located close to, or within the lateral wall of the nasal cavity (medial wall of the maxillary sinus). Its subdivisions supply the medial and posterior walls of the maxillary sinus. It is one of the three primary arterial suppliers to the maxillary sinus.

See: Infraorbital artery, Posterior superior alveolar artery.

Posterior superior alveolar artery

Branch of the internal maxillary artery, at the pterygopalatine fossa. This branch descends on the maxillary tuberosity and gives off numerous subdivisions that enter the alveolar process to supply the maxillary sinus membrane and posterior teeth. It is one of the three primary arterial suppliers to the maxillary sinus.

See: Infraorbital artery, Posterior lateral nasal artery.

Posterior superior alveolar nerve

Branch of the maxillary nerve which arises within the pterygopalatine fossa, courses downward and forward, passing through the pterygomaxillary fissure, and enters the posterior aspect of the maxilla. It innervates the maxillary sinus, the molars, the buccal gingiva and the adjoining portion of the cheek.

See: Anterior superior alveolar nerve.

Postoperative maxillary sinus cyst

See: Secondary maxillary mucocele.

Pre-angled abutment

See: Angulated abutment.

Prednisolone

An intramuscular and intravenous glucocorticoid with an intermediate half-life.

See: Glucocorticoid.

Prednisone

An oral glucocorticoid that is the dehydrogenated analog of cortisol. It is used as an anti-inflammatory drug, with an intermediate half-life.

See: Glucocorticoid.

Preemptive analgesia

The use of analgesic medications before the onset of noxious stimuli.

Prefabricated abutment

A machine-manufactured abutment.

See: Abutment, Stock abutment, Angulated abutment.

Prefabricated cylinder

A prefabricated component made of a noble alloy, which connects to a dental implant or abutment. A compatible alloy is cast to it to form a custom abutment for a cement-retained or screw-retained prosthesis.

Preliminary cast

An initial, pre-operative impression of the pre-existing condition of the teeth and associated structures used for study and diagnosis, custom tray fabrication, or diagnostic wax-up.

Preload

Energy transferred to a screw when a torque is applied during tightening. This stretching keeps the screw threads tightly secured to the screw's

mating counterpart and holds them together by producing a clamping force between the screw head and its seat.

Premachined margin

An CAD CAM manufactured or custom fabricated abutment with a specific shape at the margin to allow for desired emergence profile and fit of the restoration.

See: Abutment, Preable abutment, Zirconia abutment, Prefabricated abutment, Stock abutment.

Preable abutment

An abutment that can be prepared and modified from its original manufactured design.

Preprosthetic

Performed or occurring before insertion of a prosthesis.

Preprosthetic surgery

Procedures that are performed to enhance prosthetic outcomes which may include; alveoplasty, tooth extractions, maxillary tuberosity reduction, removal of exostosis or excessive undercuts, mylohyoid ridge reduction, bone reduction to gain width for implant surgery, bone grafting, etc.

Preprosthetic vestibuloplasty

See: Vestibuloplasty.

Press-fit

State of retention of a dental implant at the time of its insertion that results from the slight compression of the osteotomy walls by the implant body.

Pressure necrosis

Cell death due to insufficient local blood supply from pressure. In implant dentistry, it refers to the loss of bone that occurs following the application of excessive pressure by the insertion of a dental implant.

Primary bone

See: Bone.

Primary closure

See: Healing by first (primary) intention.

Primary implant failure

See: Early implant failure.

Primary maxillary mucocele

Maxillary sinus lesion caused by blockage of the ostium which results in herniation through the sinus walls.

See: Secondary maxillary mucocele.

Primary stability

See: Initial stability.

Primary union

See: Healing by first (primary) intention.

Primitive bone

See: Bone.

Probing depth

The distance from the free mucosal or gingival margin to the base of the peri-implant or periodontal sulcus as measured by a periodontal probe.

Processing analog

Syn: Processing jig.
A duplicate of either the male or female part of an attachment that is incorporated into a working model.

Profiler (bone)

Bur that removes bone around the platform of a root-form dental implant to allow the connection of components to the implant. Different profiler diameters are used to accommodate a desired component diameter.

Profilometer

Device for tracing and recording at high magnification the roughness of a surface.

Progenitor cell

An undifferentiated cell that possesses the ability to transform into one or more types of cells.

Progressive loading

Refers to the gradual increase in the application of load on a prosthesis, and thus to a dental implant.

Progressive maxillary sinus hypoplasia

An uncommon clinical entity that represents a persistent decrease in sinus volume resulting from centripetal retraction of the maxillary sinus walls.

Prophylaxis

The use of measures to prevent the onset of disease.

See: Antibiotic prophylaxis.

Proprioception.

The perception of movement and spatial orientation arising from stimuli within the

body itself. In the oral cavity these stimuli are detected by mechanoreceptors within the periodontal ligament (PDL) that provide highly sensitive neural feedback.

See: Periodontal ligament (PDL).

Prospective study

A study planned to observe events that have not yet occurred.

See: Retrospective study.

Prosthesis

Syn: Restoration.

An artificial replacement of a missing part of the body.

Prosthetic platform

See: Platform.

Prosthetic retaining screw

See: Prosthetic screw.

Prosthetic screw

A threaded fastener used to connect a prosthesis to a dental implant, an abutment, or a mesostructure.

Prosthetic space

See: Crown height space (CHS).

Prosthetic table

See: Platform.

Protocol

A detailed plan describing the proposed execution of an activity such as surgical protocol, prosthetic protocol, and research protocol.

Provisional abutment

See: Temporary abutment.

Provisional implant

See: Transitional implant.

**Provisional prosthesis/
restoration**

See: Interim prosthesis/restoration.

Pterygoid implant

A root-form dental implant that has its origin in the region of the former second maxillary molar and its end point encroaches in the scaphoid fossa of the sphenoid bone. The implant

follows an intrasinus trajectory in a dorsal and mesio-cranial direction, perforating the posterior sinusal wall and the pterygoid plates.

Pullout force

Force needed to displace an implant along its long axis and opposite from its direction of placement.

Pulsed mode

Type of operation in which the laser emits radiation energy in the form of pulses.

Punch technique

See: Tissue punch technique.

P-value

Probability that a test statistic will assume a value as extreme as or more extreme than that seen under the assumption that the null hypothesis is true.

**Quality of Life**

The standard of health, comfort, and happiness experienced by an individual or group.

Quality of Life Index

The Physical Quality of Life Index (PQLI) is an attempt to measure the quality of life or well-being of a country. The value is the average of three statistics: basic literacy rate, infant mortality, and life expectancy at age one, all equally weighted on a 0 to 100 scale, as used in the dental literature.

**Radiographic guide**

Obj See: Radiographic template.

Radiographic marker

A radiopaque structure of known dimension or a material incorporated in, or applied to, a radiographic template to yield positional or dimensional information.

Radiographic template

A guide derived from a diagnostic wax-up and worn during the radiographic exposure to relate the tooth position to the anatomical structures. It serves to assist in the diagnosis and planning phase for dental implants.

Radionecrosis

Osteonecrosis induced by radiation usually due to radiotherapy to treat a malignancy of the head and neck region.

Radiopaque

A material that is opaque to X-rays or similar radiation.

Radiopaque marker*See: Radiographic marker.***Ramus frame implant**

Full arch mandibular implant with a tripododal design that consists of a horizontal supragingival connecting bar with endosseous units placed into the rami and another vertical portion into the symphyseal area.

Ramus graft

An autogenous bone graft harvested from the lateral aspect of the ascending ramus of the mandible. The graft is mostly cortical bone.

Ramus implant

Type of blade implant placed into the anterior border of the ramus of the mandible.

Ramus (mandibular)*See: Mandibular ramus.***Random assignment***Syn: Randomization.*

Procedure by which each subject has an equal probability of being assigned to each different treatment condition in a study.

Random controlled trial

A prospective study of the effects of a particular procedure or material, in which subjects are randomly assigned to either of two groups: test or control. The test group receives the procedure or material, while the control group receives a standard procedure, or material, a different test procedure or a placebo.

Randomization*See: Random assignment.***Range**

Statistical measure of dispersion. The highest and lowest values in a distribution.

Rapid manufacturing*See: Solid freeform fabrication (SFF), Stereolithography, Three-dimensional printing.***Rapid prototyping**

The automatic construction of physical objects using solid freeform fabrication. It takes virtual designs from computer-aided design (CAD) or animated modeling software, transforms them into thin, virtual, horizontal cross-sections and then creates each cross-section in physical space, one after the next until the model is finished. (e.g., three-dimensional printing, stereolithography).

*See: Stereolithography, Three-dimensional printing, Solid freeform fabrication (SFF).***Ratchet**

A wrench used with threaded implants to facilitate final implant seating.

Reactive bone*See: Bone.***Reattachment**

The act or process of reattaching something, or something that has been reattached. The repair of epithelial and connective tissue to root surfaces and bone such as after traumatic injury. Should not be confused with new attachment.

Reamer

Tool designed to finish the mating surface of a metal cylinder/coping, specifically the screw seat interface.

Recipient site*Syn: Host site.*

Site which received a soft or hard tissue graft.

Recombinant human bone morphogenetic protein (rhBMP)

Osteoinductive protein produced by recombinant DNA technology.

Record

Information or data recorded in any medium (eg, handwriting, print, photographs, video, or any electronic form). It provides evidence of what was planned, the treatment provided, and results. Part of the patient chart.

Record base

Occluding surfaces fabricated on interim or final denture bases for the purpose of making maxillomandibular relation records and arranging teeth.

Re-entry

The surgical reopening of a site to improve or observe results from an initial procedure.

*See: Stage-two surgery.***Regenerate***Syn: Distraction zone.*

The tissue that forms between gradually separated bone segments in distraction osteogenesis.

Regenerate maturation

The completion of mineralization and remodeling of the regenerate tissue.

Regeneration

Reproduction or reconstitution of a lost or injured part to its original state.

*See: Repair.***Regional acceleratory phenomenon (RAP)**

A local response to a stimulus in which tissues form two to ten times more rapidly than the normal regeneration process. The duration and intensity of RAP are directly proportional to the kind and amount of stimulus and the site where it was produced.

Registration*Syn: Coregistration.*

The process of transforming different sets of data into one coordinate system., such as for dental implant planning.

Data may be photographs, data

from different imaging devices, optically scanned data converted to STL files. Generally it involves matching features in a set of images using a direct alignment method. A preliminary procedure in the digital workflow for dental implant planning or navigation surgery in which the patient data is synchronized against the pre-acquired imaging scan by the use of fiducial markers.

Rejection

Immune response of a host organism to a transplanted organ, biological tissue, or medical device.

Releasing incision

See: Periosteal release, Vertical incision.

Remodeling (bone)

The turnover of bone in small packets by BMUs (basic multicellular unit of bone remodeling).

Remount index

A record base that allows the maxillary and mandibular casts to be mounted on an articulator for assessment and adjustment.

Remount record

See: Remount index.

Removable prosthesis

A restoration that is removable by the patient. The restoration may be partial arch (RPD: Removable partial denture), or complete arch (RCD: Removable complete denture).

See: Denture, Fixed prosthesis.

Removal torque value (RTV)

Syn: Reverse torque value.

Measure of the rotational force needed to rupture the bone-implant interface of a root-form implant.

Repair

Healing of a wound by tissue that does not fully restore the architecture or function of the part that was lost.

See: Regeneration.

Replica

See: Analog/analogue.

Residual ridge

Portion of the alveolar ridge that remains after the alveoli have disappeared from the alveolar process, following extraction of teeth.

Residual ridge resorption

See: Ridge atrophy.

Resin

A class of thermoplastic resins produced by polymerization of acrylic or methacrylic acid or their derivatives; used in the fabrication of medical and dental prostheses and appliances. Resin is also used in the process of 3-D printing and stereolithography.

Resonance frequency analysis (RFA)

Technique for clinical measurement of implant stability/mobility. A measurement is registered from a transducer attached to the abutment or implant. The device records the resonance frequency arising from the implant-bone interface (change in amplitude over induced frequency band).

Resorbable

The ability of an autogenous graft to dissolve physiologically.

See: Bioabsorbable.

Resorbable blast media (RBM)

Surface treatment resulting from blasting the surface of a dental implant with a biocompatible material such as tricalcium phosphate.

Resorbable membrane

A barrier placed within a surgical site to facilitate healing, which degrades by enzymatic activity or by hydrolyses in a variable amount of time depending upon the material composition of the membrane.

Resorption

The loss of substance or bone by physiologic or pathologic means.

See: Bone resorption.

Restoration

See: Prosthesis.

Restorative dentistry

The study, diagnosis and integrated management of diseases of the teeth and their supporting structures and the rehabilitation of the dentition to functional and aesthetic requirements of the individual.

Restorative platform

See: Platform.

Retaining screw

A threaded fastener that secures a prosthetic reconstruction to an abutment or a mesostructure.

See: Abutment screw.

Rethreading

Repair of the damaged internal threads of a root-form dental implant using a tap instrument.

Retrievability

Refers to the capability of removing a prosthesis undamaged.

Retrograde peri-implantitis

See: Implant periapical lesion.

Retromolar implant

Endosseous dental implant placed in the mandibular retromolar area for the purpose of protraction or retraction of the dentition.

See: Orthodontic implant, Temporary anchorage device (TAD).

Retrospective study

A study designed to observe events that have already occurred.

See: Prospective study.

Reverse torque test (RTT)

Test used to assess the extent of osseointegration, specifically the shear strength at the bone-implant interface, by applying a rotational force in a direction opposite to that used to place the implant.

Reverse torque value

See: Removal torque value (RTV).

Revolutions per minute (Rpm)

Unit of rotational speed at which a bur or drill turns.

Ridge

The remainder of the alveolar process after teeth extraction.

See: Alveolar process, Residual ridge.

Ridge atrophy

Decrease in volume of a ridge due to resorption of bone.

Ridge augmentation

Increasing the dimension of an existing alveolar ridge.

Ridge defect

A deficiency in the contour of an edentulous ridge. The deficiency can be in the vertical (apicocoronal) and/or horizontal (buccolingual, mesiodistal) direction.

Ridge expansion

Surgical widening of a residual ridge in the lateral direction (buccolingually) with osteotomes and/or chisels, to accommodate the insertion of a dental implant, and/or bone graft.

Ridge mapping

Penetration of anesthetized soft tissue with a graduated probe or caliper at several sites and transposing the information to a

diagnostic cast. The shape of the residual ridge is reproduced by trimming back the stone of the cast to the corresponding depth of soft tissue.

See: Ridge sounding.

Ridge preservation

Syn: Extraction socket graft, Socket graft, Socket preservation.

The immediate placement of a grafting material, or any other procedure (e.g., GBR), performed on an extraction socket following tooth extraction. The concept underlying this treatment modality is the conservation of the bone and soft tissues contour by avoiding bone resorption with a resultant ridge defect.

Ridge resorption

Refers to the loss of bone in an edentulous area.

See: Residual ridge.

Ridge sounding

Syn: Bone sounding, Sounding.

Penetration of anesthetized soft tissue in order to determine the topography of the underlying bone.

See: Ridge mapping.

Ridge splitting

See: Ridge expansion.

Rigid fixation

Clinical term that implies absence of observed mobility.

Risedronate

Oral nitrogen-containing bisphosphonate used for the prevention and treatment of osteoporosis and treatment of Paget's disease. Its mechanism of action involves the inhibition of osteoclast formation and activity.

Risk assessment

The process by which qualitative or quantitative assessments are made regarding the likelihood

of adverse events occurring as a result of exposure to specified health hazards or absence of beneficial influences.

Risk factor

An environmental, behavioral, or biological condition that, if present directly increases the probability of a disease or an adverse event occurring, thereby affecting the outcome of a treatment modality.

Risk indicator

A probable risk factor that has not been confirmed by longitudinal studies.

Root-form implant

An endosseous dental implant circular in cross section. It may be cylindrical, tapered, threaded, perforated, solid, or hollow in design.

Root submergence

Root retention in which the tooth structure is reduced below the level of the alveolar crest and the soft tissue is allowed to heal over it. This technique is used to minimize residual alveolar ridge resorption.

See: Root submersion.

Root submersion

See: Root submergence.

Rotational freedom

The amount that an abutment can rotate when connected to an implant.

Rotational misfit

The movement between implant and abutments, which can be correlated to the dimension of the gap present between the abutment and implant's anti-rotational feature.

See: Rotational freedom.

Rough surface

See: Textured surface.

S

Round bur

Circular bur used to mark a site for an osteotomy or to decorticate bone. It may also be used in the outline of a lateral window access for the purpose of sinus grafting.

R value

A two-dimensional roughness parameter calculated from the experimental profiles after filtering. R_a : The arithmetic average of the absolute value of all points of the profile, also called central line average height. R_t : The maximum peak-to-valley height of the entire measurement trace.

Sandblasting

Grit blasting of an implant surface using sand.

See: Blasted implant surface.

Sandblasted, large grit, acid-etched implant surface (SLA)

A surface treatment that improves surface roughness to enhance osseointegration through greater bone implant contact (BIC) as well as an increased rate at which osseointegration occurs.

Sandwich Technique

A method of augmentation of deficient alveolar ridges based upon the positive properties of different materials positioned in layers to enhance the outcomes of bone grafting.

Saucerization

See: Pericervical saucerization.

Sausage Technique

A surgical procedure used in horizontal guided bone regeneration utilizing a resorbable native collagen membrane to completely immobilize a particulate bone graft and thus protect the augmentation site for the initial weeks of maturation.

See: Particulate graft, Membrane.

Scaffold

A three-dimensional biocompatible construct (may be seeded with cells) that serves as a framework on which tissue can grow. It may or may not be biodegradable.

Scaler

See: Implant scaler.

Scalloped implant

A root-form dental implant with the level of the implant-abutment junction more coronal interproximally than facially or lingually.

Scanning abutment

A device that engages a dental implant which has known material and geometry matching the specific platform interface which must be completely seated onto the implant to allow for an intraoral scan to record its position along with the surrounding anatomical structures creating a digital impression. The resulting digital STL file can be used for CAD CAM design and fabrication of restorative components such as custom abutments, titanium bars, or monolithic zirconia full-arch milled restorations. Scanning abutments can also be used by the dental laboratory when positioned onto implant analogs in a working cast, and placed within a desktop optical scanner to digitize the information creating an STL file for use in the CAD CAM process.

See: Scan body, Intraoral scanner,

Desktop optical scanner, Standard

Tessellation Language or Standard

Triangulation Language (STL).

See: Artifact

Scan body

See: Scanning abutment, Intraoral scanner, Desktop optical scanner, Standard Tessellation Language or Standard Triangulation Language (STL).

Scanographic template

A radiographic template utilized during CT/CBCT -scan acquisition with or without fiducial markers.

See: Radiographic template.

Scar

Fibrous tissue replacing normal tissues after healing.

Scatter

Scatter is an opaque streaking type artifact seen in CT/CBCT images that are caused by photons that are diffracted from their original path after interaction with dense intraoral objects such as metal fillings or crown restoration which can interfere with the diagnostic process as it can mask underlying anatomic structures.

See: Artifact

Schneiderian membrane

Syn: Sinus membrane (maxillary). Layer of pseudostratified ciliated columnar epithelium cells lining the maxillary sinus.

See: Perforation.

Screw

A threaded fastener used to adjoin two mating parts.

See: Abutment screw, Prosthetic screw, Retaining screw.

Screw fracture

The breakage of a prosthetic screw.

Screw implant

Threaded root-form dental implant, which can be parallel-sided or tapered.

See: Root-form implant, Threaded implant.

Screw joint

The junction of two parts held together by a screw (e.g., implant-abutment screw joint).

Screw loosening

A prosthetic complication whereby a screw loses its preload causing the loosening of a restoration or abutment.

Screw preload

Clamping or stretching force that occurs across the interface of implant components being attached together via screw tightening.

Screw-retained

The use of a screw for retention of an abutment or a prosthesis.
See: Cement-retained.

Screw tap

See: Tap.

Screw tightening

Act of turning a threaded component into an access hole until resistance is encountered.

Screw-type implant

See: Threaded implant.

Sealing screw

See: Hygiene cap.

Seating surface

Obj See: Platform.

Secondary closure

See: Healing by second (secondary) intention.

Secondary implant failure

See: Late implant failure.

Secondary maxillary mucocele

Syn: Postoperative maxillary sinus cyst.

Maxillary sinus lesion caused by previous trauma or surgery which divides the sinus into two compartments. The cyst is derived from the antral epithelium and mucosal remnants that were previously entrapped within the surgical site.

See: Primary maxillary mucocele.

Secondary stability

The fixation of a dental implant to the bone over time and after osseointegration has occurred.

See: Initial stability, Implant stability quotient (ISQ).

Secondary union

See: Healing by second (secondary) intention.

Second-stage permucosal abutment

See: Healing abutment.

Second-stage surgery

See: Stage-two surgery.

Segmentation

The process of partitioning an CT/CBCT image into different parts. In medical imaging, these segments often correspond to different tissue classes or objects based on density values or degrees of radiopacity within a scan., ie separating teeth and roots from surrounding bone.

Selective Laser Sintering (SLS)

An additive manufacturing technique that uses a high power laser (for example, a carbon dioxide laser) to fuse small particles of plastic, metal (direct metal laser sintering – DMLS), ceramic, or glass powders into a mass that has a desired 3-dimensional shape.

See: Additive Manufacturing (AM), Direct Metal Laser Sintering (DMLS), Solid freeform fabrication (SFF)

Self-tapping

Feature in the design of the apical aspect of a threaded dental implant or fixation screw that enables it to create its own thread path in the bone.

Sensor (CBCT)

The sensors used in CBCT machines are amorphous silicon (α -Si) flat panels, CMOS flat panels or image intensifiers coupled to a CCD.

See: CMOS device, CCD, image intensifiers.

Sensor (Digital X-ray)

Instead of X-ray film, digital radiography uses a digital image capture device or sensor. This gives advantages of immediate image preview and availability; elimination of costly film processing steps; a wider dynamic range, which makes it more forgiving for over and under-exposure; as well as the ability to apply special image processing techniques that enhance overall display quality of the image with computer software.

See: Digital radiography.

Scintillators

Used in CBCT scanners to convert x-rays into visible light, or with solid-state sensors, such as a CMOS device, which detect the scintillator's emission.

See: CMOS device.

Sensory mapping

The process of evaluation and delineation of a cutaneous, mucous, or gingival area presumably affected by an altered sensation or dysesthesia.

Septum

A partition of hard or soft tissue, separating two cavities or chambers in the body.

See: Interalveolar septum, Interradicular septum, Maxillary sinus septum.

Sequential drilling

The use of drills in a specific order to gradually prepare and increase the diameter of an osteotomy prior to dental implant insertion, usually based on manufacturer's drilling protocol.

Sequestration

Necrotic bone that becomes separated from surrounding healthy bone. It is a complication (sequela) of osteomyelitis, and bisphosphonate-induced osteonecrosis of the jaw.

See: Osteomyelitis, Bisphosphonate-induced osteonecrosis of the jaw (BIONJ)

Set Screw

A prosthetic or retention fastener of a smaller dimension that is used to connect a superstructure to a mesostructure primarily in a lingual or palatal placement. Usually processed in the laboratory the components can be pre-fabricated with an internally threaded bore and screw system.

See: Prosthetic screw, Prosthetic retaining screw.

Sharpey's fibers

A matrix of connective tissue consisting of bundles of strong collagenous fibers connecting periosteum to bone. They are part of the outer fibrous layer of periosteum, entering into the outer circumferential and interstitial lamellae of bone tissue.

Shear stress

Stress caused by a load (two forces applied toward one another but not in the same straight line) that tends to slide one portion of object over another.

See: Stress.

Short implant

Implants with normal diameters but decreased length. Usually used in multiples to support mandibular overdentures.

Silent sinus syndrome (SSS)

Rare clinical entity characterized by unilateral enophthalmos and hypoglobus secondary to thinning and inward bowing of the maxillary sinus roof in the absence of signs or symptoms of intrinsic sinonasal inflammatory disease. The obstruction of the ostium of the ostiomeatal complex results in hypoventilation of the maxillary sinus.

Silicone

A class of synthetic materials that are polymers with a chemical structure based on chains of alternate silicon and oxygen atoms, with organic groups attached to the silicon atoms. Such compounds are typically resistant to

chemical attack and insensitive to temperature changes and are used to make rubber, plastics, polishes, lubricants, and in some dental impression materials.

Simulation

Simulation is the imitation of the operation of a real-world process or system over time. The act of simulating requires that a physical or virtual model be developed; this model represents the key characteristics or behaviors/functions of the selected physical or abstract system or process. As in the simulated placement of dental implants using interactive treatment planning software; practicing and planning prior to treating actual patients.

See: Virtual tooth/teeth, Virtual Surgical Planning, Rapid prototyping.

Simultaneous placement

The insertion of a root-form dental implant in conjunction with another surgical procedure performed at the same site (e.g., grafting).

Single-stage implant

See: One-stage implant.

Single-tooth implant

A replacement of one natural tooth root and clinical crown with a stand alone dental implant.

Sintered

Treated by sintering.

See: Sintering.

Sintered (porous) surface

A dental implant surface produced when spherical powders of metallic or ceramic materials become a coherent surface layer with the metallic core of an implant body. Porous surfaces are characterized by pore size, pore shape, pore volume, and pore depth, which

are affected by the size of the spherical particles used and the temperature and pressure conditions of the sintering chamber.

Sintering

Heating a powder below the melting point of any component such as to permit agglomeration and welding of particles by diffusion alone, with or without applied pressure. Recent developments in CAD CAM dentistry use special partially sintered ceramic (zirconia), glass-bonded ceramic ("Vitablock") or glass-ceramic ("ips e.max" lithium disilicate) formed into machinable blocks, which are fired again after milling.

See: CAD/CAM, Zirconia, ips e.max, Lithium Disilicate.

Sinus

Air space within bone.

Sinus augmentation

See: Sinus graft.

Sinus elevation

See: Sinus graft.

Sinus elevator

Spoon-like dull-shaped instrument used to elevate the Schneiderian membrane.

Sinus graft

Syn: Maxillary antroplasty, Sinus augmentation, Sinus elevation, Sinus lift, Subantral augmentation.

Augmentation of the antral floor with autogenous bone and/or bone substitutes to accommodate dental implant insertion.

Sinusitis (maxillary)

Inflammation of the sinus. Signs include sensitivity of teeth to percussion, fever and facial swelling. Symptoms include nasal congestion, postnasal discharge, facial pain/ headache, rhinorrhea, halitosis, popping of ears, and muffled hearing.

Sinus lift

See: Sinus graft.

Sinus lining

See: Schneiderian membrane, Sinus membrane (maxillary).

Sinus membrane (maxillary)

See: Schneiderian membrane.

Sinus perforation

See: Perforation.

Sinus pneumatization (maxillary)

Maxillary sinus enlargement. With aging, and especially after loss of maxillary teeth and reduction of masticatory forces acting on the maxilla, the sinus walls get gradually thinner as a result of the increase in size of the maxillary sinus.

See: Pneumatization.

Sinus septum

See: Septum.

Sinusitis

See: Maxillary rhino-sinusitis.

Site development (implant)

Process by which the quantity and quality of soft and/or hard tissues are augmented at a site prior to dental implant placement.

Site preservation

See: Ridge preservation.

Sleeper implant

A nonpathologic endosseous dental implant excluded from the prosthetic reconstruction.

SmartPeg

A soft aluminum metal manufacturer-specific peg which threads into/onto the dental implant to allow conduction of resonance frequency (RFA) to determine lateral stability using an ISQ probe attached to an Osstell instrument.

See: Implant stability quotient (ISQ), Osstell, Resonance frequency analysis (RFA).

Smile line

An imaginary line that follows the contour of the upper lip during the act of smiling. In an ideal smile line, the edges of the upper teeth should be parallel to your lower lip when smiling.

See: Lip Line.

Socket

See: Alveolus, Extraction socket.

Socket graft

See: Ridge preservation.

Socket preservation

See: Ridge preservation.

Socket shield technique

A piece of root remaining vestibularly between the implant and the buccal bone plate to preserve hard and soft tissue.

**Soft tissue augmentation**

Grafting procedure accomplished using a variety of different methods for the purpose of increasing soft tissue volume.

Soft tissue cast

A cast with the implant laboratory analog platform surrounded by an elastic mucosa simulating material.

See: Abutment-level impression, Fixture-level impression, Implant-level impression.

Soft-tissue defect

A limitation in the natural appearance of the soft tissue due to inadequate volume as a result of trauma, infection, scarring, or insufficient underlying bony.

Soft tissue graft

See: Acellular dermal allograft, Connective tissue graft, Subepithelial connective tissue graft (SCTG).

Software-based planning

The use of preoperative computed tomography or cone-beam computed tomography imaging with computer software for the diagnosis and planning of dental implant placement and restoration. Information

derived from the planning can be used in navigation surgery or the generation of a surgical or stereolithographic guide.

See: Stereolithographic guide, Surgical guide.

Solid freeform fabrication (SFF)

Syn: Additive fabrication, Layered manufacturing.

A collection of techniques for manufacturing solid objects by the sequential delivery of energy and/or material to specified points in space to produce that solid.

See: Rapid prototyping, Stereolithography, Three-dimensional printing.

Solid screw

A root-form threaded dental implant of a circular cross section without any vents or holes penetrating the implant body.

SonicWeld Rx

Takes advantage of the unique thermoplastic properties of resorbable polymer with cutting edge ultrasonic technology. Lateral/vertical bone augmentation.

Sounding

See: Ridge sounding, Bone sounding.

Spark erosion

See: Electric discharge method (EDM).

Specialized mucosa

See: Oral mucosa.

Spiral cone-beam computed tomography

See: Cone-beam computed tomography (CBCT).

Splinting

Joining of two or more teeth or implants into a rigid or nonrigid unit by means of fixed or removable restorations or devices.

See: Cross-arch stabilization.

Split-crest technique*See: Ridge expansion.***Split-ridge technique***See: Ridge expansion.***Split-thickness flap***See: Partial thickness flap.***Spongy bone***See: Bone.***Stability**

Absence of clinically detectable movement of a graft, membrane, or a dental implant.

*See: Implant stability, Initial stability, Secondary stability.***Stabilization***See: Bicortical stabilization, Cross-arch stabilization, Stability.***Stabilization pin***See: Anchor pin, Fixation pin, Fixation screw.***Staged protocol**

A treatment sequence where one procedure is performed, followed by another at a later time.

Stage-one surgery*Syn: First-stage surgery.*

A surgical procedure that consists of placing an endosseous dental implant in bone and suturing the soft tissues over the implant, thereby submerging the implant for healing.

Stage-two surgery*Syn: Second-stage surgery.*

Surgical procedure consisting of the exposure of a submerged dental implant platform to the oral environment by the connection of an abutment which extrudes through the soft tissue.

Staggered implant placement*See: Tripodization.***Standard abutment**

Machined titanium, or zirconia component used to support a cement-retained or screw-retained prosthesis.

*See: Stock abutment.***Standard deviation (SD)**

A measure of the variability, or dispersion of a distribution of scores. The more scores cluster around the mean, the smaller the standard deviation.
See: Standard error (SE).

Standard error (SE)

The standard deviation of the values of a given function of the data, over all possible samples of the same size. It is calculated by dividing the standard deviation of the sample by the square root of the number of subjects in the sample.
See: Standard deviation (SD).

Standard Tessellation Language or Standard Triangulation Language (STL)*Abbr: Standard Tessellation Language or Standard Triangulation Language*

A file format native to rapid prototyping, stereolithography, and CAD software. This file format is supported by many software packages; used for rapid prototyping and computer-aided manufacturing. STL files describe

only the surface geometry of a three dimensional object without any representation of color, texture or other common CAD model attributes.

Staple implant

The mandibular staple is an endosseous implant that will permit the attachment of a lower denture in cases of severe alveolar bone atrophy. It is placed through a submental incision and inserted into seven parallel holes drilled into the mandible.
See: Mandibular staple implant.

**Static loading**

Situation where a dental implant is subject to a force which is constant in magnitude and direction (e.g., during its use for orthodontic anchorage).
See: Dynamic loading.

Stem cell

Undifferentiated cell of embryogenic or adult origin that can undergo unlimited division and give rise to one or several different cell types.

Stent

1. Device used in conjunction with a surgical procedure to keep a graft in place or protect a surgical site during initial healing.
2. Incorrect term for guide, splint, or template.

*Sugg: Radiographic template, Stereolithographic guide, Surgical guide, Surgical template.***Stepped implant**

An endosseous, root-form dental implant, with parallel-sided walls of different diameter joined together thus forming a series of steps of decreasing diameter corono-apically.

Stereolithographic guide

A drilling guide generated from a computer-aided manufacturing (CAM), according to information derived from a software-based planning, used for dental implant placement in vivo.

*See: Drilling guide, Software-based planning, Surgical guide.***Stereolithographic model**

A three-dimensional reconstruction of the maxilla or mandible generated from a computer-aided manufacturing (CAM) according to information derived from software-based planning.

Stereolithography*Syn: Three-dimensional modeling.*
A rapid manufacturing and rapid prototyping technology for creating a three-dimensional model by using lasers driven by CAD software from information derived from a computed tomography (CT) scan. It is used for surgical planning and the generation of a stereolithographic guide.*See: Rapid prototyping, Solid freeform fabrication (SFF), Three-dimensional printing.***Sterile technique**

Surgical procedure performed under sterile conditions. It takes place under hospital operating room conditions and follows

operating room protocol for setup, instrument transfer and handling, and personnel movement. Surgical scrubs, head covers, shoe covers, and sterile gowns are worn.

See: Clean technique.

Stippling

The presence of a minutely lobulated surface on the attached gingiva, like that of an orange peel; it is a normal adaptive process, varying from one person to another. Its absence or reduction can indicate gingival disease.

Stitching

See: Image Stitching.

Stock abutment

A machine-manufactured abutment as part of the implant manufacturer's catalog of prosthetic components. Can be straight (non-angulated), or angulated, or refer to any abutment that is pre-fabricated as part of the manufacturer's catalog.

See: Abutment, Angulated abutment, Prefabricated abutment.

Straight abutment

See: Nonangulated abutment.

Straight implant

See: Parallel-sided implant.

Strain

Change in dimension of an object when subjected to an external force (stress).

Stress

Force or load applied to an object.

See: Bending stress, Compressive stress, Shear stress, Tensile stress, Torsion stress.

Stress concentration

The point at which the stress is substantially higher than elsewhere due to the geometry of the stressed object or the point of application of the force.

Stress shielding

1. The reduction in bone density (osteopenia) as a result of removal of typical stress from the bone by an implant (for instance, the femoral component of a hip prosthesis).
2. The design of the implant-abutment interface which reduces the stress on the internal fixation screw by shifting stress to the implant body.
3. Stress shielding or concentration can be easily induced on the interface and results in a potential risk to the long-term stability of the implant. The success or failure of an implant is determined by the manner how the stresses at the bone-implant interface are transferred to the surrounding bones.

Stripped threads

Broken or distorted threads of a screw or the internal threads of a root-form dental implant.

Stripping

The damage (i.e., distortion or obliteration) of the internal threads of a dental implant, screw, or abutment.

Stud-type attachment

See: Ball attachment.

Subantral augmentation

See: Sinus graft.

Subcrestal implant placement

See: Crestal implant placement.

Subepithelial connective tissue graft (SCTG)

Surgical transplantation of harvested autogenous connective tissue to a recipient area for the purpose of epithelial keratinization, to gain root coverage, to improve esthetics, and/or correct ridge deficiencies.

Sublingual artery

A branch of the lingual artery, with distribution to the extrinsic muscles of the tongue, the

sublingual gland, and the mucosa of the region, and with anastomoses to the artery of the opposite side and the submental artery.

Submerged healing

Implant placement within the bone complete soft tissue coverage requiring a second surgery to expose the implant for prosthetic restoration.

See: Two-stage surgery.

Submerged implant

A dental implant covered by soft tissue, and isolated from the oral cavity.

See: Submerged healing.

Submerged root

See: Root submergence.

Submergeble implant

See: Two-stage implant.

Subnasal elevation

Surgical technique to augment the bone height in the anterior maxilla by uplifting the nasal

mucosa, similar to a sinus elevation procedure where the sinus membrane is elevated.

Subperiosteal implant

Implant designed to rest on the surface of bone, under the periosteum. It consists of a customized casting, made of a surgical grade metal or alloy. Periosteal abutments, posts and intraoral bars are designed for prosthetic retention. Three types may be distinguished:

1. Complete subperiosteal implant: Implant used in a completely edentulous arch.

2. Unilateral subperiosteal implant: Implant located on one side of the posterior mandible or maxilla.

3. Circumferential subperiosteal implant: Implant that bypasses remaining teeth or implants.

4. Tripodial subperiosteal implant: Implant that uses the bilateral ramus and anterior symphysis for support



Subtractive Manufacturing (SM)

Conventional machining is a form of subtractive manufacturing, in which a collection of material-working processes utilizing power-driven machine tools, such as saws, lathes, milling machines, and drill presses, are used with a sharp cutting tool to physically remove material to achieve a desired geometry.

See: CAD/CAM, CNC milling (CNC).

Subtracted surface

See: Subtractive surface treatment.

Subtraction radiography

A technique used to detect radiographic density change at two points in time to detect bone formation or loss.

Subtractive surface treatment

Syn: Subtracted surface.

Alteration of a dental implant surface by removal of material.
See: Additive surface treatment, Textured surface.

Success criteria

Conditions established by a study protocol for the evaluation of a procedure as a success.



Success rate

The percentage of successes of a procedure or device (e.g., dental implant) in a study or clinical trial according to success criteria defined by the study protocol.

See: Survival rate.

Sulcular epithelium

Syn: Crevicular epithelium.

The nonkeratinized epithelium of the mucosal sulcus surrounding dental implants and teeth.

Sulcular incision

Syn: Intracrevicular incision, Intrasulcular incision.

Cut made directly into the gingival or peri-implant sulcus, reaching the alveolar bone crest and following the contours of the teeth or dental implants.

Summers Technique

See: Maxillary sinus floor elevation, Osteotome technique

Superimposition

Superimposition is the placement of an image or video on top of an already-existing image or video, usually to ascertain changes over time i.e. comparing before and after results. Can be useful in digital radiography, CT, and CBCT imaging modalities

Superstructure

The prosthesis that is supported by dental implants with or without an intervening mesostructure.

Suppuration

The formation of pus.

Supracrestal implant placement

See: Crestal implant placement.

Surface alteration

Modification of an implant surface by additive or subtractive surface treatment.

See: Additive surface treatment, Subtractive surface treatment.

Surface characteristics (implant)

The topography of a surface is defined in terms of form, waviness and roughness.

Roughness describes the smallest irregularities in the surface, while form relates to the largest structure or profile. Waviness and roughness are often presented together under the term texture. Two types of dental implant surfaces are usually distinguished: machined and textured.

See: Machined implant surface, Textured surface.

Surface roughness

Qualitative and quantitative features of a dental implant surface determined two-dimensionally by contact stylus profilometry (See: R value) or three-dimensionally by a confocal laser scanner (See: S value).

See: Surface characteristics (implant).

Surface treatment

Modification to the implant surface either structural or chemical to alter its properties, usually to enhance the process of osseointegration.

See: Textured surface.

Surgical bed

Site surgically prepared to receive a graft.

Surgical guide

A guide, used to assist in the preparation for and placement of dental implants which can be derived from CT/CBCT imaging data, or laboratory fabricated

from a diagnostic wax-up to help define drilling position, trajectory, angulation, and depth control. There are three basic types of surgical guides derived from CT/CBCT scans: (1) bone-supported (bone-borne), (2) soft-tissue / mucosal-supported (mucosal-borne), and (3) tooth-supported (tooth-borne)

See: Surgical template, Stereolithographic guide.



Surgical indexing

Record used to register the position of an implant at stage-one or stage-two surgery.

Surgical navigation

See: Navigation surgery.

Surgical template

Obj See: Surgical guide.



Survival rate

The percentage of survivals in a study or clinical trial according to predetermined criteria.

See: Kaplan-Meier analysis, Success rate.

T

Suture

1. Material used in closing a surgical or traumatic wound (e.g., silk, catgut, polyglycolic acid).
2. Act of uniting a wound through suturing.
3. The fixed and fibrous union of two bones.

S value

A three-dimensional roughness parameter calculated from topographical images. S_a : The arithmetic average of the absolute value of all points of the profile. It is a height descriptive parameter; S_{α} : A space descriptive parameter; S_{dr} : The developed surface area ratio.

Syphysis

Fibrocartillagenous fusion between two bones.

See: [Mandibular syphysis](#).

Syngeneic graft

See: [Isograft](#).

Synthetic bone

See: [Alloplast](#), [Bone substitute](#).

Synthetic graft

See: [Alloplast](#), [Bone substitute](#).

System (implant)

1. A product line of implants with specific design, surgical protocol, instrumentation, and matching prosthetic components. An implant system may represent a specific concept, inventor, or patent.

See: [Configuration](#).

2. ISO definition: "Dental implant components that are designed to mate together. It consists of the necessary parts and instruments to complete the implant body placement and abutment components." (ISO 10451)

Systematic review

Process of systematically locating, critically appraising, and synthesizing evidence from scientific studies, using appropriate statistical techniques, to draw conclusions based on data summaries and report what is known and not known.

Tack

Syn: [Fixation tack](#).

Metal or bioabsorbable pin with a flat head used to secure the position of a barrier membrane in guided bone regeneration.

Tap

Syn: [Threader](#), [Threadformer](#).

1. Bone tap: Device used to create a threaded channel in bone for a fixation screw or prior to the insertion of a dental implant into an osteotomy.
2. Metal tap: An instrument made out of a hard metal, used for rethreading damaged internal threads of a dental implant.

Tapered implant

An endosseous, root-form dental implant, with a wider diameter coronally than apically. The sides of the implant converge apically. It may be threaded, or nonthreaded.

Tapping

The process of creating a threaded channel in bone with a bone tap, for the placement of a fixation screw or prior to the insertion of a dental implant in an osteotomy. Also known as pretapping.

Teflon scaler

See: [Implant scaler](#).

Teflon Tape Technique

Used to obturate implant screw-access holes for screw-retained prostheses, or to act as a spacer when trying to prevent excess cement around cement-retained restorations.

Telescopic coping

A thin cast cover fabricated for a prepared tooth or implant abutment, which acts as an under substructure for a prosthesis.

Template

Guide.

See: [Radiographic template](#), [Stereolithographic guide](#), [Surgical guide](#).

Temporary abutment

Syn: [Temporary cylinder](#).

Abutment used for the fabrication of an interim restoration. The interim restoration may be cemented on the temporary abutment; or the temporary abutment may be incorporated in the interim restoration enabling it to be screw-retained.

Temporary anchorage device (TAD)

A temporary implant used as an aid for orthodontic tooth movement. Miniscrew, osseointegrated palatal or retromolar dental implant, placed to control tooth movement during orthodontic treatment.

Temporary cylinder

See: [Temporary abutment](#).

Temporary healing cuff

See: [Healing abutment](#).

**Temporary prosthesis/
restoration**

See: [Interim prosthesis/restoration](#).

Tensile stress

Stress caused by a load (two forces applied away from one another in the same straight line) that tends to stretch or elongate an object.

See: [Stress](#).

Tension-free flap closure

The capacity of a surgical flap to be passively repositioned into its original position, and to maintain that position without the intervention of operator or the placement of sutures.

Tenting

The adjustment of a barrier membrane to create a space between the membrane and the bone. Tenting screws, poles, or

titanium reinforcement assist in the creation of that space.

See: [Tenting screw](#), [Tack](#).

Tenting screw

A metal screw used in guided bone regeneration to support a barrier membrane, thus maintaining a space under the membrane for bone regeneration.

Tent pole

A mechanical device fixated to the surface of the bone used to elevate a barrier membrane.

See: [Tenting](#).

Test group

See: [Experimental group](#).

Textured surface

A surface that has been altered or modified from its original machined state. A dental implant surface can be altered by addition or by reduction.

See: [Additive surface treatment](#), [Machined implant surface](#), [Subtractive surface treatment](#), [Surface characteristics \(implant\)](#).

Texturing

Process of increasing the surface area.

See: [Textured surface](#).

Thick flat periodontium

See: [Periodontal biotype](#).

**Thin scalloped
periodontium**

See: [Periodontal biotype](#).

Thread

An extruding feature of the body of threaded dental implants.

Thread depth, thickness, pitch, face angle, and helix angle are varying geometric parameters. Basic thread geometries include: V-thread, reverse buttress thread, and power (square) thread.

Thread angle

The angle between the flanks, measured in an axial plane section.

Thread crest

The prominent part of a thread, whether internal or external.

Thread depth

The distance between the major and minor diameter of the thread.

Threaded implant

An endosseous, root-form dental implant, with threads similar to a screw. It is also known as a screw shaped implant. It may be parallel-sided or tapered.

Threader

See: [Tap](#).

Thread flank

An angled side of the body of a thread that connects the root to the crest.

Threadformer

See: [Tap](#).

Thread lead

The distance a screw thread advances axially in one turn.

Thread path

The conduit in the internal aspect of a screw access hole which guides the threads of a component. Also, the pathway created by a bone tap in an osteotomy, which directs a dental implant during insertion.

Thread pitch

The distance from a point on the screw thread to a corresponding point on the next thread measured parallel to the axis.

Thread root

The bottom of the groove between the two flanking surfaces of the thread whether internal or external.

**Three-dimensional
imaging**

See: [Computed tomography \(CT\)](#), [3-D Imaging](#).

Three-dimensional implant

An endosseous dental implant that is inserted laterally, from the facial aspect of an edentulous ridge.

**Three-dimensional
modeling**

See: [Stereolithography](#), [volumetric reconstruction](#).

Three-dimensional printing

A category of rapid prototyping technology. A three-dimensional object is created by layering and connecting successive cross sections of material from information derived from a computed tomography scan. It is used for surgical planning and the generation of a surgical guide.

See: [Stereolithography](#), [3-D printing](#)

**Three-dimensional volume
rendering**

Volume rendering has existed since the mid-1980s but is now widely available on CBCT imaging devices. All 3D rendering techniques represent a 3D volume of data in one or more two-dimensional (2D) planes, conveying the spatial relationships inherent in the

data with use of visual depth cues. Three-dimensional volume rendering generates clinically accurate and immediately available images from the full CT or CBCT data set without extensive editing, allowing the radiologist and clinician to address specific questions concerning patient care by interactively exploring different aspects of the data set. In addition, with specific software, the 3D volume rendering can be exported as an STL file for rapid prototyping, and 3D printing of biomedical models.

See: [Standard Tessellation Language or Standard Triangulation Language \(STL\)](#), [Rapid prototyping](#), [3-D printing](#), [Surgical guide](#)

Three-dimensional volumetric reconstruction

See: [Three-dimensional volume rendering](#)

Tibia

The inner and larger bone of the leg below the knee. It articulates superiorly with the femur and head of the fibula and inferiorly with the talus. It may serve as a source for bone grafting.

Tibial bone graft

A bone graft harvested from the proximal tibia. The graft is mostly cancellous.

Tibial bone harvest

See: [Tibial bone graft](#).

Tissue bank

Laboratory specialized in the harvesting, processing, and sterilization of tissues from humans or animals into graft materials.

Tissue-borne

See: [Tissue-supported](#).

Tissue Conditioner

Non-surgical methods of improving the patients' denture foundation tissues, including the use of tissue rest, occlusal correction, temporary soft liners and/or improvement of hygiene. Tissue conditioning is usually considered prior to performing a permanent reline and or making final impressions for complete or partial dentures, or after a surgical procedure to protect the underlying tissue.

Tissue conditioning

Process of restoring health to oral stress-bearing soft tissues following surgical or mechanical trauma using the occluding prostheses to transmit continuous stress of force and motion to the basal-seat tissues. A tissue conditioner is often used.

See: [Tissue Conditioner](#).

Tissue engineering

The application of the principles of life sciences and engineering to develop biological substitutes for the restoration or replacement of tissues.

Tissue-integrated prosthesis

Term originally proposed by P.I. Branemark and colleagues to describe a full-arch prosthesis fabricated for an edentulous arch.

Tissue punch

A sharp circular instrument of different diameters used to create an incision in the soft tissue.

See: [Tissue punch technique](#).

Tissue punch technique

Circular incision made in the soft tissue over a submerged dental implant, manually or mechanically, of a diameter similar to the implant platform. This results in the exposure of the implant by the removal of a circular piece of soft tissue.

See: [Stage-two surgery](#).

Also, the excision of a circular piece of soft tissue to access the underlying bone surface for implant placement.

See: [Flapless implant surgery](#), [Tissue punch](#).

Tissue recession

See: [Gingival recession](#).

Tissue-supported

Syn: [Tissue-borne](#).

Supported by the soft tissue of the edentulous alveolar ridge.

Titanium (Ti)

Titanium is a chemical element, Symbol Ti, and anatomic number of 22, atomic weight of 47.90, and specific gravity of 4.5. The metal has two useful properties including corrosion resistance and the highest strength-to-density ratio of any metallic element. Commercially pure titanium (grade 4 Ti) is 99% pure Ti.

See: [Commercially pure titanium \(CP-Ti\)](#), [Titanium alloy \(Ti-6Al-4V\)](#).

Titanium alloy (Ti-6Al-4V)

A biocompatible medical alloy used for the fabrication of dental implants and their components. Its physical properties are superior to most commercially pure titaniuns. The most common titanium alloy used for the fabrication of dental implants is Ti-6Al-4V, which contains approximately 90% titanium, 6% aluminum, and 4% vanadium.

See: [Commercially pure titanium \(CP-Ti\)](#), [Titanium \(Ti\)](#).

Titanium mesh

A flexible titanium grid used in bone augmentation procedures to assist in maintaining a predetermined volume for bone regeneration during healing. The mesh is usually fixated to the bone with tacking or fixation screws.

See: [Tack](#), [Fixation screw](#).

Titanium oxide

1. Surface layer of varying surface composition (e.g., TiO_2 , TiO_4) immediately formed upon exposure of pure metallic titanium and titanium alloy to air. This corrosion-resistant layer protects the dental implant against chemical attack in biological fluids.

2. Metal oxide blasted on implant surfaces to increase the surface area.

Titanium plasma sprayed (TPS)

A process involving high temperature deposition of titanium powders that are totally or partially melted and then rapidly resolidified, forming a dense or porous coating.

See: Plasma spray.

Titanium reinforced

A feature in a nonabsorbable membrane consisting of thin titanium ribbons, which

increase stiffness and assist in maintaining a predetermined shape during healing.

See: Expanded polytetrafluoroethylene (ePTFE).

Tomograph

The radiographic equipment used in tomography.

Tomography

A technique for displaying a representation of a cross section through a human body such as the mandible or maxilla, or other solid object using X-rays or ultrasound.

See: Computed tomography (CT), Cone-beam computed tomography (CBCT), Tomogram.

Tomogram

A type of x-ray revealing a particular layer or “slice” of the mouth while blurring out other layers. This x-ray examines structures that are difficult to clearly see because other nearby structures are superimposed, blocking the view.

Tooth-supported surgical guide

A surgical template used in partially edentulous cases to help guide the trajectory and depth of the drilling sequence supported by adjacent teeth.

See: tooth-borne surgical guide, mucosal-borne surgical guide, bone-borne surgical guide.

Torque

1. A force that produces or tends to produce rotation or torsion.
2. A measurement of an instrument capacity to do work or to continue to rotate under resistance to rotation. It is expressed in Newton centimeters (Ncm).

Torque controller

See: Torque driver.

Torque driver

Syn: Torque controller, Torque indicator, Torque wrench.

An instrument, manual or electronic, used to apply a torque.

Torque gauge

See: Torque indicator.

Torque indicator

See: Torque driver.

Torque wrench

See: Torque driver.

Torsion stress

Stress caused by a load that tends to twist an object.

See: Stress, Torque.

Torus

An exophytic bony prominence or exostosis mainly occurring at the midline of the hard palate (palatal), or on the lingual aspect of the mandible in the canine-premolar area (mandibular). It may be used as a source of autogenous bone.

Trabecular bone

See: Bone.

Transepithelial

Going through or across the epithelium.

Transfer coping

See: Impression coping.

Transfer (implant) impression

See: Closed-tray impression.

Transforming growth factor beta (TGF- β)

Growth factor produced by platelets and bone cells that increases the chemotaxis and mitogenesis of osteoblast precursors and also stimulates osteoblast deposition of the collagen matrix for wound healing and bone regeneration.

Transitional implant

Syn: Provisional implant.

Dental implant used during implant therapy to support a transitional fixed or removable denture. It is usually an immediately loaded narrow diameter implant, which may be removed at a later stage of treatment.

Transitional prosthesis/ restoration

A temporary prosthesis to replace a missing tooth or teeth during the course of treatment.

Transmandibular implant

See: Mandibular staple implant.

Transmucosal

A component or structure extending from internal anatomy and passing through or across the oral mucosa to the external environment.

Transmucosal abutment

Any prosthetic component that connects an implant to the oral cavity through the soft tissue.

Transmucosal loading

The pressure exerted through the soft tissue on a submerged dental implant, usually by a removable denture.

Transosseous implant

Syn: Transosteal implant.

1. A dental implant that completely penetrates through the edentulous ridge buccolingually.
2. A dental implant that completely penetrates through the parasympyseal region of the mandible, from the inferior border through the alveolar crest.

See: Mandibular staple implant.

Transosteal implant

See: Transosseous implant.

Transport segment

In distraction osteogenesis, the sectioned and moving segment of bone.

Trauma reconstruction

Surgical and/or prosthetic reconstruction of the maxillofacial complex, alveolar ridge, and/or teeth by means of bone grafting, implant placement, and soft tissue reconstruction.

Treatment plan

The course of therapy designed for a patient.

Trephine

Surgical act of creating a circular opening.

Trephine drill

Hollow drill used to remove a disc or cylinder of bone or other tissue.

Trial-fit gauge

Syn: Implant try-in.

Replica or near replica of the body of a specific dental implant configuration used for testing the size of the osteotomy.

Triamcinolone

An intra-articular, topical, and inhaled glucocorticoid with a long half-life.

See: Glucocorticoid.

Triangle of Bone®

A zone of available bone as visualized within a triangle shape superimposed upon a cross-sectional slice of a CT (Computed Tomography) or CBCT (Cone Beam CT) image, also described as a three-dimensional "pyramid" of bone.

Tricalcium phosphate (TCP)

An inorganic, particulate or solid form of biodegradable ceramic, which can be used as a bone substitute.

See: Biphasic calcium phosphate (BCP), Calcium phosphate.

Tripodial Subperiosteal Implant

See: Subperiosteal implant.

Tripodization

The placement of three or more dental implants with a non-linear alignment of their platforms.

Try-in screw

Threaded component matching the abutment screw, used by the restorative dentist in the clinical procedures. Its use avoids damaging the prosthetic screw which is reserved for the clinical insertion of the prosthesis.

See: Laboratory screw, Prosthetic screw.

T-test

Commonly used statistical method to evaluate the differences in means between two groups.

Tuberosity

A protuberance or elevation of bone.

See: Maxillary tuberosity.

Tunnel Technique

Periodontal surgery which increases the zone of keratinized tissue in cases where recession has occurred, or tissue bulking is needed using special instruments to lift and separate the gingiva to allow insertion of

either autologous subepithelial connective tissue graft (CTG), or acellular dermal matrix (ADM) from a tissue bank.

See: Acellular dermal matrix graft (ADM), VISTA.

Turned surface

See: Machined implant surface.

Turnover (bone)

The process of older bone being replaced by new bone, often expressed as percent per year.

Twist drill

A rotary cutting instrument with several grooves in its body used to create or widen an osteotomy.

Two-part implant

A dental implant in which the endosseous and transmucosal portions combine to present a joint surface to the tissues (i.e., implant-abutment junction).

Two-piece abutment

An abutment that connects to a dental implant with the use of an abutment screw.

Two-piece implant

A dental implant in which the endosseous and abutment portions consist of two units.

Two-stage implant

Syn: Submergible implant.
An endosseous dental implant designed to be placed according to a two-stage surgery protocol. It undergoes osseointegration while covered with soft tissue.

Two-stage surgery

A surgical protocol consisting of placing an endosseous root-form dental implant in the bone and leaving it covered with a flap. A second surgery is needed to expose the implant in order to create the prosthesis.

U**University of California at Los Angeles abutment (UCLA abutment)**

A plastic castable pattern that by adding wax or resin can be customized to the desired shape and emergence profile for a screw-retained restoration, direct to the implant.

See: Castable abutment.

Ultrasonic bone surgery

See: Piezoelectric bone surgery.

Uncovery

Popular term for the act of surgically exposing a submerged dental implant, following healing from stage-one surgery.

Sugg/See: Stage-two surgery, Implant uncovering.

Underwood cleft or septum

See: Maxillary sinus septum.

Unilateral subperiosteal implant

See: Subperiosteal implant.

**V****Valsalva maneuver**

See: Continuous suture.

Unit load

The part of the total load on a bone, carried by a square unit of its cross section or surface, that causes a corresponding strain and stress. It is arithmetically equal to the total load divided by the cross section area of the bone carrying it.

Variance

Measure of statistical dispersion about the mean. The larger the variance, the further individual values of the random variable (observations) tend to be from the mean, on average.

See: Standard deviation (SD), Standard error (SE).

Vascular endothelial growth factors (VEGF)

Factors with potent angiogenic, mitogenic, and vascular permeability, which enhance activities specific for endothelial cells.

Vascularization

The process of infiltration by blood vessels; regarded as a critical support for the health and maintenance of living tissue or the healing of a graft.

See: Angiogenesis.

Vascular supply

The source of blood to a tissue or organ.

Veneer

A coating usually of resin or ceramic material attached to the facial or buccal surface of a natural tooth, crown, or pontic restoration by bonding, cementation, or mechanical retention.

Vent

- An opening in the implant body that allows for tissue ingrowth for increased retention, stability, and antirotation.
- An opening in a surgical guide to allow for external irrigation, or to visualize proper fit in a tooth-borne template.

Verification cast

A cast made from a verification jig.

See: Verification jig.

Verification index

See: Verification jig.

Verification jig

Syn: Confirmation jig.

An index of multiple implants fabricated on the master cast and tried in the mouth to check the accuracy of the master cast. If the jig does not fit in the mouth, it is cut and reconnected. A new cast or an alteration of the master cast is then made from the reconnected jig, which is called a verification cast.

Also, a verification jig can be fabricated directly in the mouth, and a verification or master cast poured from that.

See: verification cast

Vertical dimension

Available distance between the incisal and/or occlusal surfaces of the teeth or trial wax occlusion rims during phonetics and speech.

See: Vertical dimension of occlusion (VDO)

Vertical dimension of occlusion (VDO)

Also known as occlusal vertical dimension (OVD) is a term used in dentistry to indicate the superior-inferior relationship of the maxilla and the mandible when the teeth or wax rims are situated in maximum intercuspal contact.

Vertical incision

A cut made in the soft tissue in the apicocoronal direction to allow elevation and mobilization of a flap.

Vertical mattress suture

See: Mattress suture.

Vestibular

The mouth, consists of two regions, the vestibule and the oral cavity proper. The vestibule is the area between the lateral or buccal surfaces of the teeth, residual ridges, lips and cheeks; may also refer to the space between the lingual surfaces of the teeth or residual ridges and the tongue.

Vestibular incision

See: Mucobuccal fold incision.

Vestibule

See: Vestibular.

Vestibuloplasty

Surgical procedure that increases vestibular depth, to restore alveolar ridge height by lowering muscles attaching to the buccal, labial, and lingual aspects of the jaws.

See: Preprosthetic surgery, Vestibuloplasty.

Virtual articulator

A computer software simulation based on the input of real patient data, allowing analyses with regard to static and dynamic occlusion as well as to jaw relation, useful in prosthetic, restorative, and implant dentistry.

See: Articulator

Virtual reality (VR)

A term that applies to computer-simulated environments that can simulate physical presence in places in the real world, as well as in imaginary worlds. Most current virtual reality environments are primarily visual experiences, displayed either on a computer screen or through special stereoscopic displays, but some simulations include additional sensory information, such as sound through speakers or headphones, and tactile information.

Virtual Surgical Planning

Pre-surgical manipulation of 3D models of the surgical site to predict outcomes, design surgical guides, simulate the actual surgery, or to develop options. Generally limited to movement of bone, specifically in craniofacial and orthopedic surgery, but techniques are available for orthognathic and maxillofacial surgery.

Virtual tooth/teeth

Computer simulation of single or multiple teeth via software as and aid to planing implant(s). Software applications capable of designing prosthetic restorations virtually by means of CAD CAM fabrication for natural teeth or for dental implants

VISTA

Abbr: vestibular incision subperiosteal tunnel access

Vital bone content

The percentage of newly formed bone in a histological section obtained from a healed bone grafted site.

Vitreous carbon

Biomaterial with a glassy amorphous structure once used for the fabrication of endosseous implants or as an implant coating.

Volkmann's canal

Passages containing arteries. They run within the osteons perpendicular to the Haversian canals, interconnecting the latter with each other and the periosteum.

See: Haversian canal.

Voxel

Volumetric pixel or Volumetric Picture Element is a volume element, representing a value on a regular grid in three dimensional space as a unit of measure in Computed Tomography and CBCT. Isotropic being cube shaped (CBCT) and Orthotropic being rectangular (CT).

Waxing sleeve

A premade castable plastic pattern used to fabricate a custom abutment or the framework of a restoration.

See: Castable abutment.

Wax-up

Wax and/or resin pattern contoured to the desired form for a trial denture, cast coping, metal framework, or for diagnostic purposes. Process of placing denture teeth on a wax-rim.

See: Diagnostic wax-up, Lost-wax casting technique.

Wicking (effect)

Bacterial colonization of a suture thread.

Wolff's Law

A principle stating that bone, either normal or abnormal, will develop the structure most suited to resist those forces acting on it.

Wound

Any break in the continuity of a tissue.

X**Wound closure**

Flap approximation with sutures.
See: Healing by first (primary) intention, Healing by second (secondary) intention, Tension-free flap closure.

Wound dehiscence

See: Dehiscence.

Wound healing

The process by which skin or other body tissue repairs itself after trauma. Healing occurs over time in three separate phases: inflammatory, proliferative, and maturation.

Woven bone

See: Bone.

Wrench

Device or tool used to apply torsional force to an object as in tightening or loosening a screw, or delivering by rotational force an implant to a receptor site.

See: Cylinder wrench, Open-ended wrench, Torque driver.

Y**Young's modulus**

See: Modulus of elasticity.

Xenograft

Syn: Heterogeneous graft, Heterograft.

Grafting material harvested from different species from that of the recipient.

X-ray (Dental)

There are two main types of dental X-rays: intraoral (meaning the X-ray film is inside the mouth) such as a periapical radiograph, and extraoral (meaning the X-ray film is outside the mouth) such as a panoramic radiograph, or CBCT. *See: Panoramic radiograph, Cone-beam computed tomography (CBCT), Tomograph.*

Z**Zirconia**

See: Zirconium (Zr), Zirconium dioxide (ZrO₂).

Zirconia abutment

An esthetic alternative to metal implant abutments due to the white color of zirconia. Zirconia abutments can be custom milled, or stock abutments from a specific manufacturer, available in a variety of configurations with or without pre-machined margins.

See: Abutment, Stock abutment, Angulated abutment.

Zirconium (Zr)

A steel-gray hard ductile metallic element with a high melting point that occurs widely in combined forms. It is highly resistant to corrosion, and is used especially in alloys and in refractories and ceramics.

Zirconium dioxide (ZrO₂)

Syn: Zirconia.

White crystalline oxide of zirconium occurring in nature as

the mineral baddeleyite. It is an amorphous, odorless, tasteless powder or crystalline solid, used as an opacifying agent for dental porcelain, and other ceramic processes. In implant dentistry, it is used for the fabrication of all-ceramic abutments, substructures of fixed partial dentures, crown copings, and dental implants.

Zoledronate

A very potent intravenous nitrogen-containing bisphosphonate used to prevent skeletal fractures in patients with cancers such as multiple myeloma and prostate cancer. It is also used to treat hypercalcemia caused by cancer.

Zygomatic implant

A root-form dental implant that has its origin in the region of the former first maxillary

molar. Its end point engages the zygomatic bone. The implant is directed in a lateral and upward direction with an angulation of approximately 45 degrees from a vertical axis, following an intrasinus trajectory.

Zygomatic guide

A surgical template to aid in the surgical positioning of a zygomatic implant, usually CT/CBCT derived via stereolithography or 3-D printing.

See: Surgical guide.

Illustrations & Diagrams

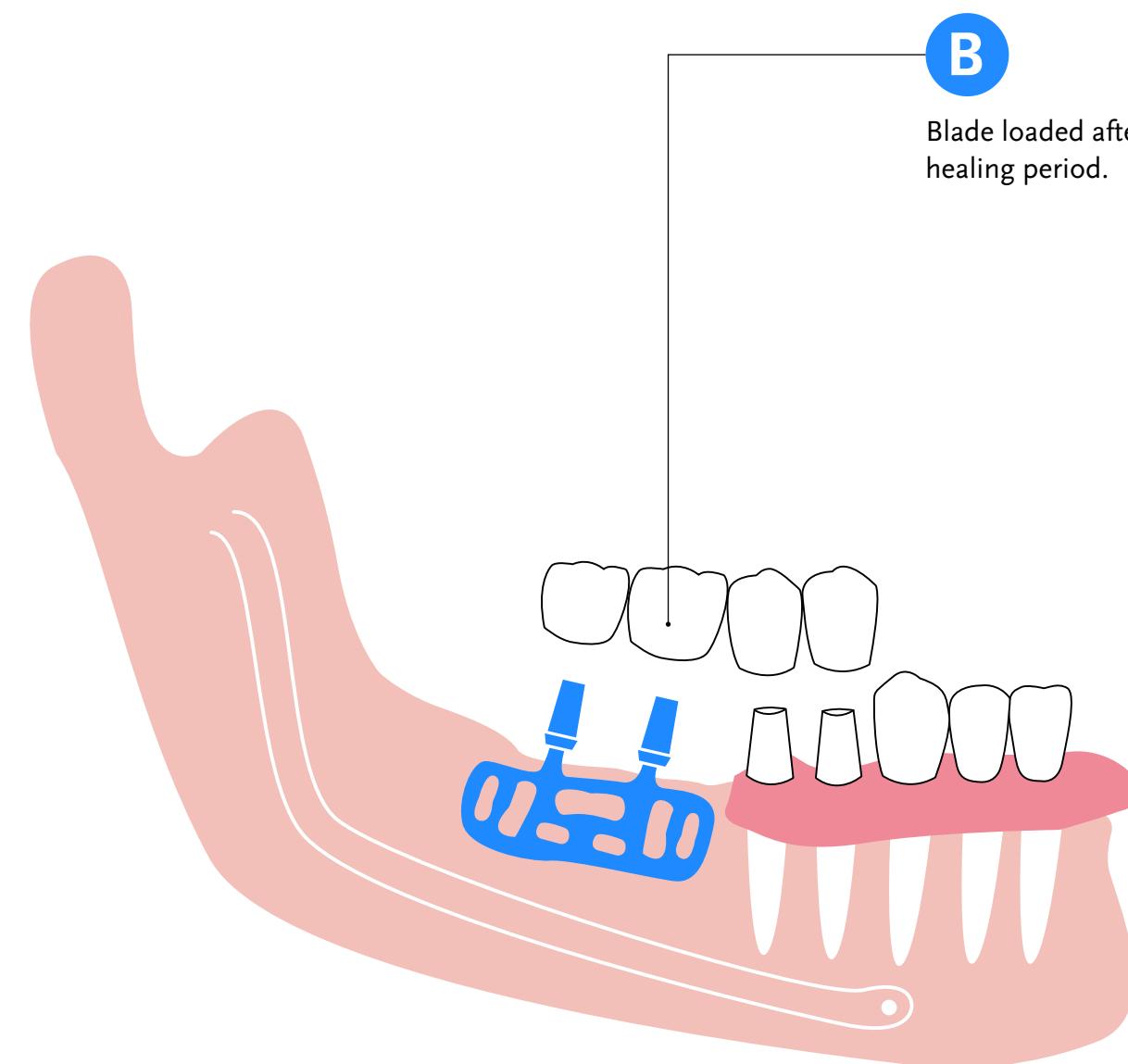
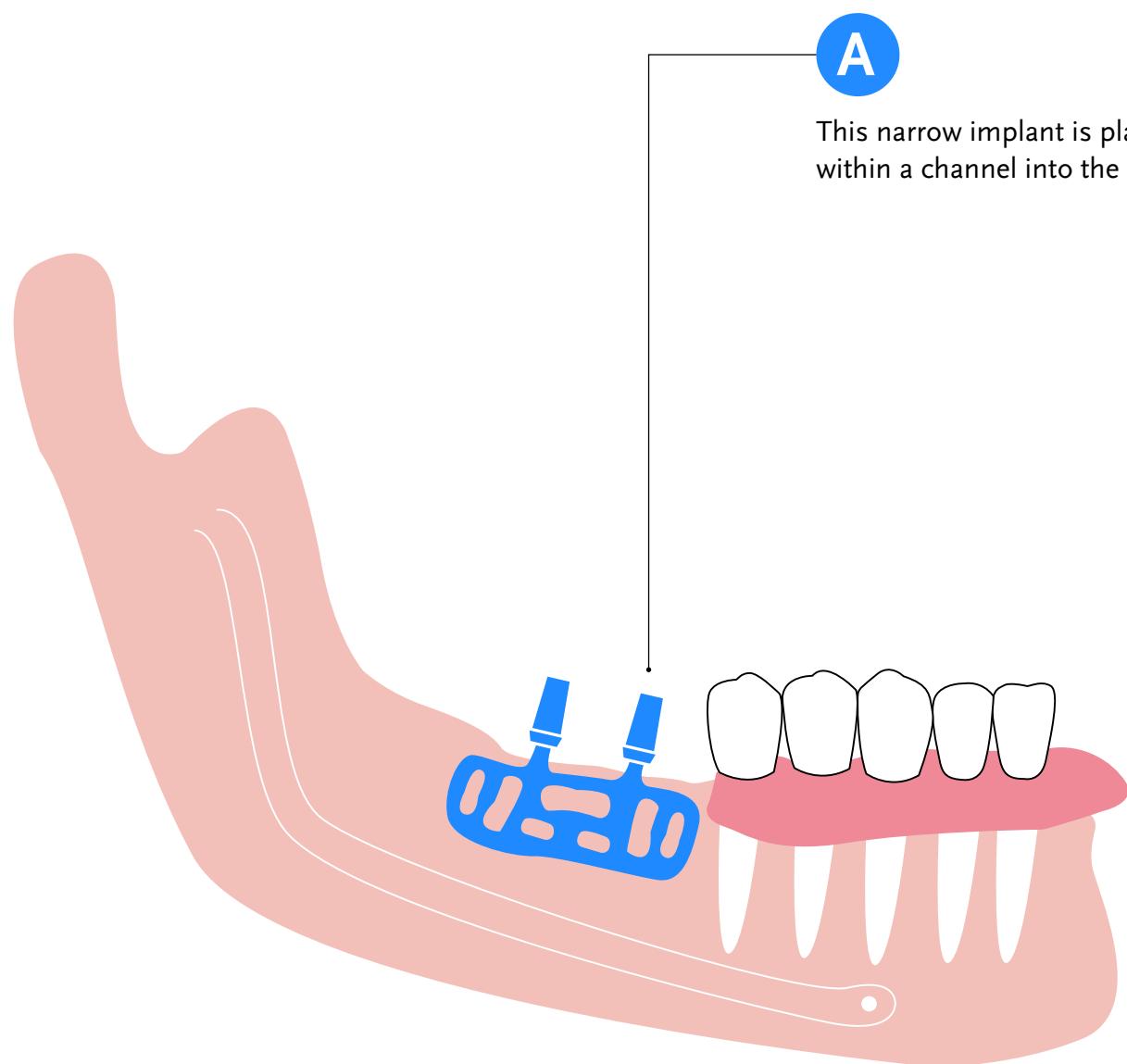
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Implant Types

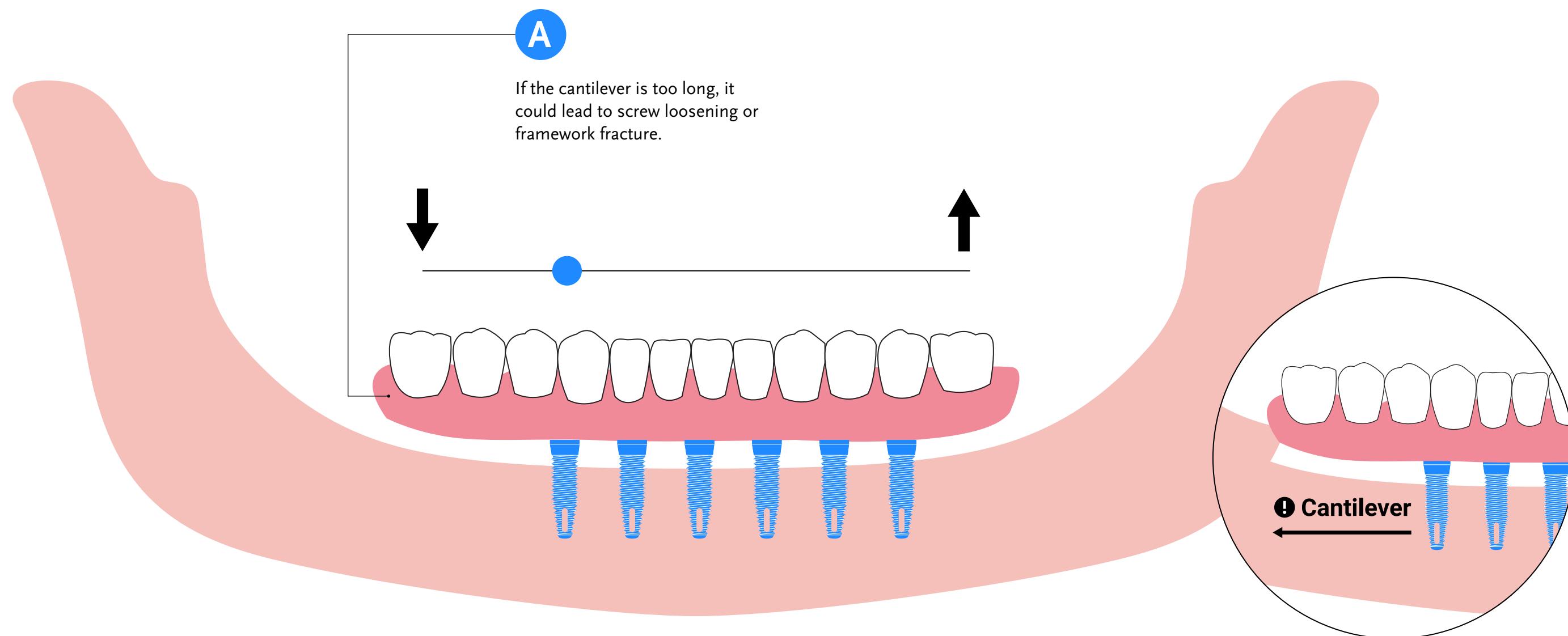
The Blade Implant

See: [Blade implant](#).



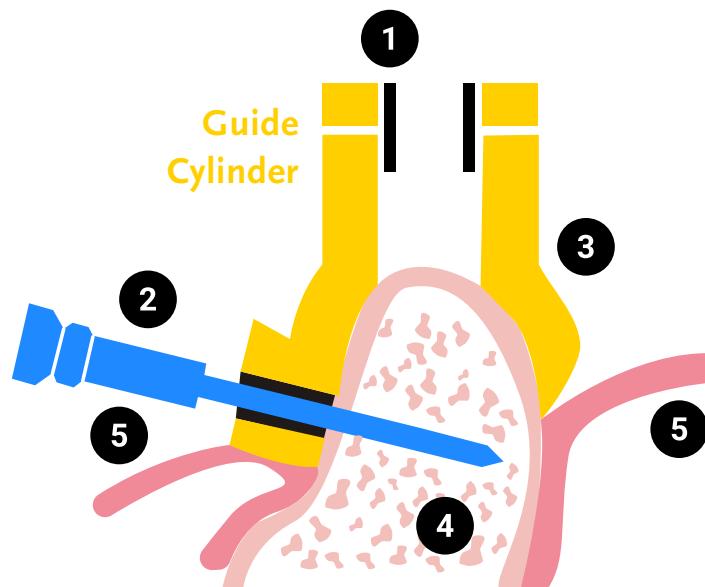
Cantilever Distal Extension

See: [Cantilever, Distal extension](#).



Types of Guided Surgery Templates

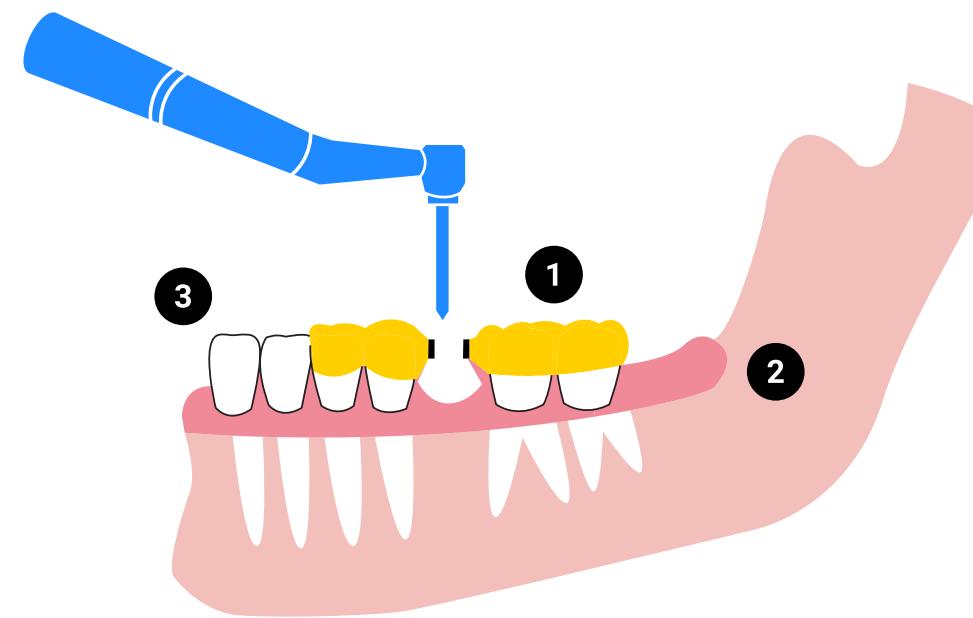
See: [Surgical guide](#).



A

Bone Borne Template

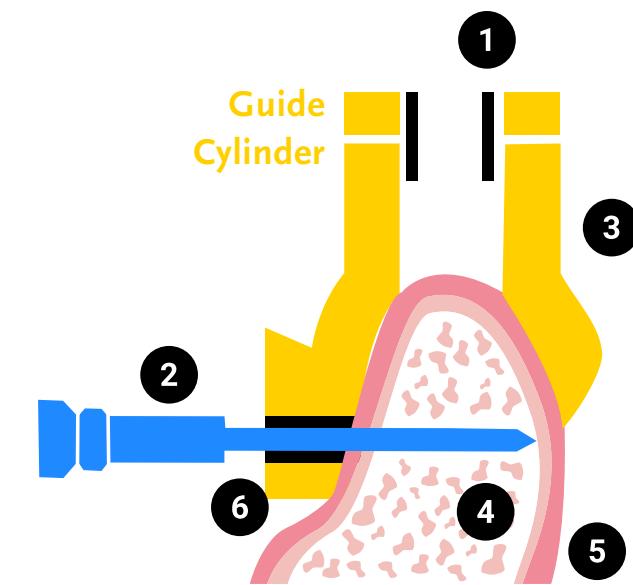
1. Guide Cylinder
2. Guide Anchor Pin (Fixation Pin/Screw)
3. Surgical Template Seated on Bone
4. Bone
5. Soft Tissue



B

Tooth Borne Template

1. Surgical Template
2. Soft Tissue
3. Teeth



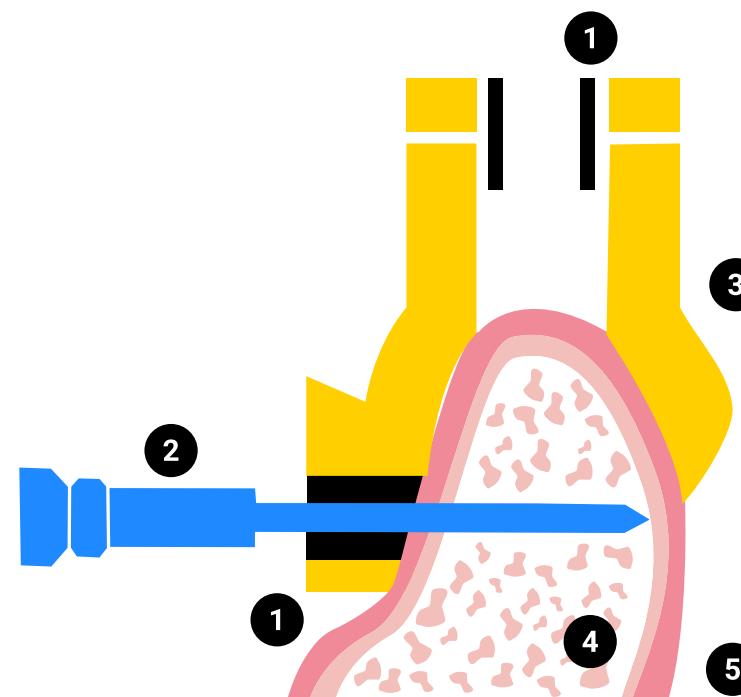
C

Mucosal-Borne Template

1. Guide Cylinder
2. Guide Anchor Pin (Fixation Pin/Screw)
3. Surgical Template
4. Bone
5. Soft Tissue
6. Guide Cylinder

Prolongation in guided surgery

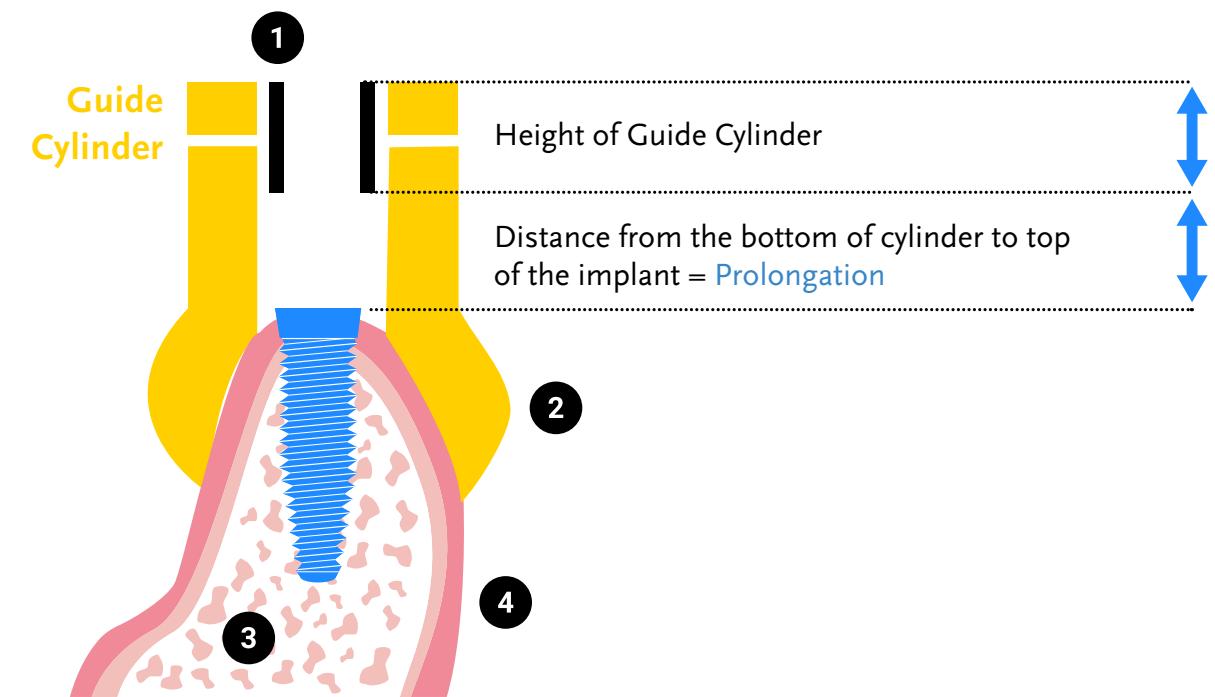
See: [Surgical guide](#).



A

Template with Fixation

1. Guide Cylinder
2. Guide Anchor Pin (Fixation Pin/Screw)
3. Surgical Template
4. Bone
5. Soft Tissue



B

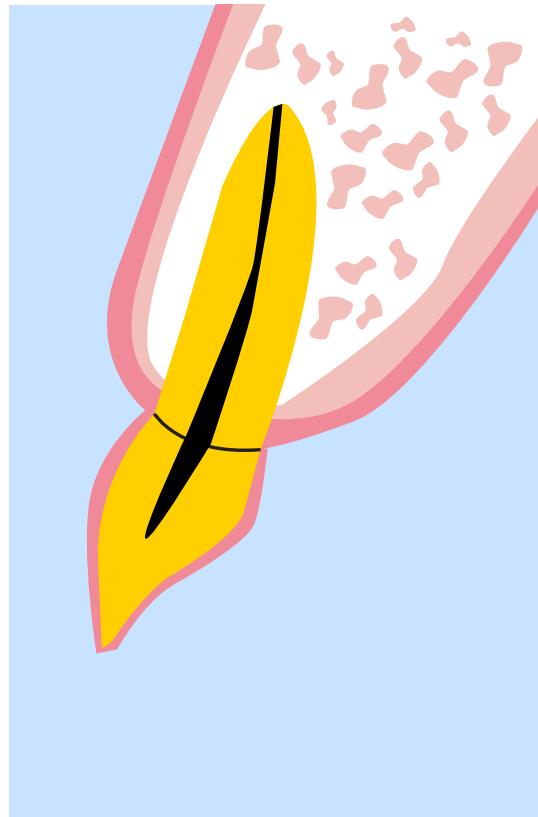
Soft Tissue Supported Template

1. Guide Cylinder
2. Surgical Template
3. Bone
4. Soft Tissue

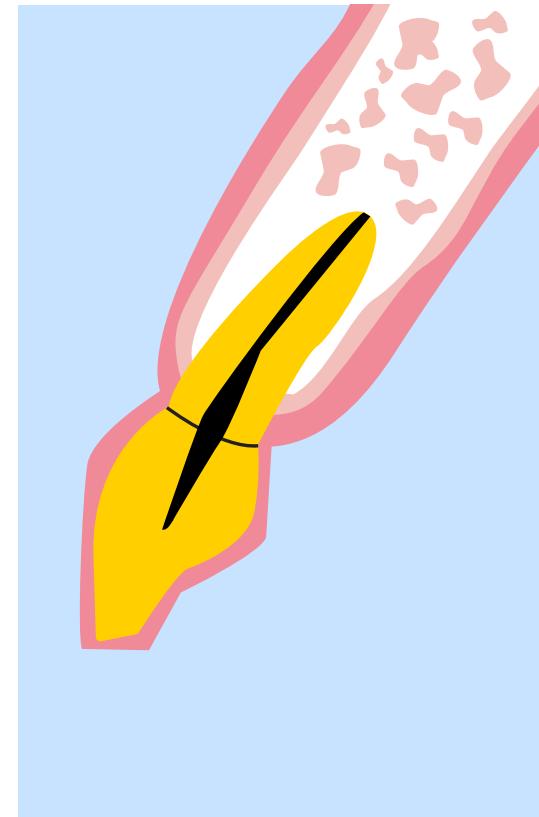
Classification of Sagittal Root Position

Classification of Sagittal Root Position in Relation to the Anterior Maxillary Osseous Housing

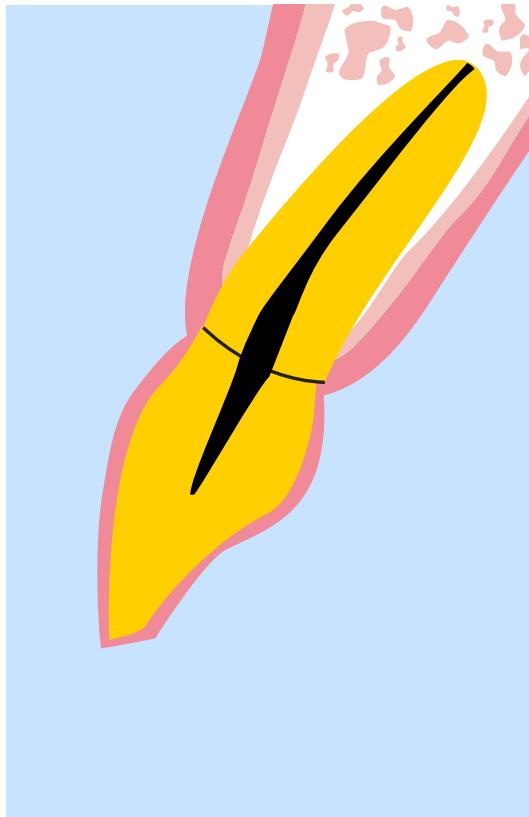
See: [Surgical template](#).

**A**

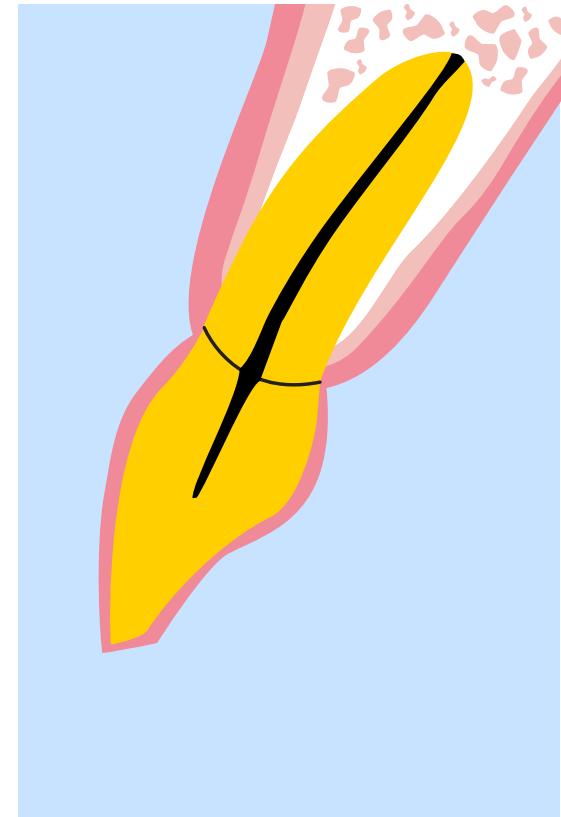
Class I Sagittal Root Position

**B**

Class II Sagittal Root Position

**C**

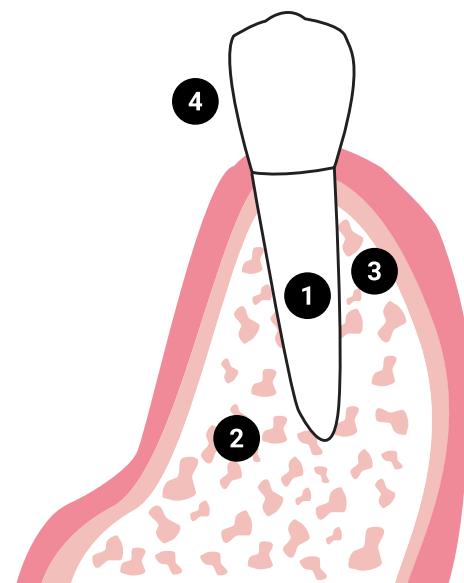
Class III Sagittal Root Position

**D**

Class IV Sagittal Root Position

Socket Shield Technique

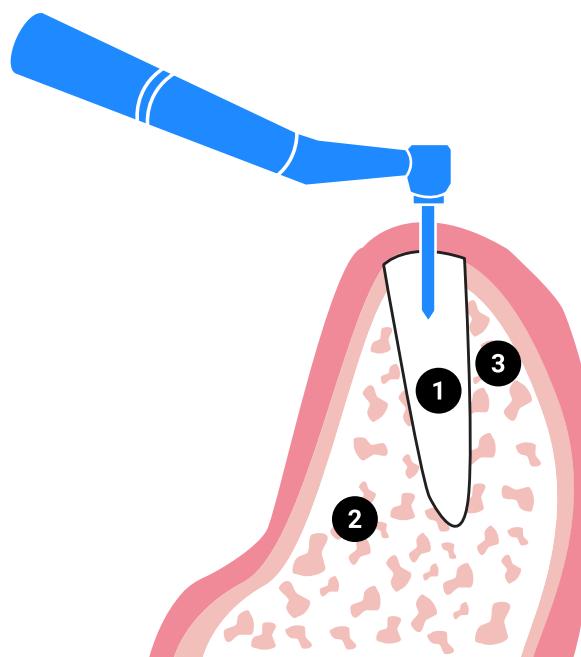
See: [Socket shield technique](#).



A

Tooth to be Extracted

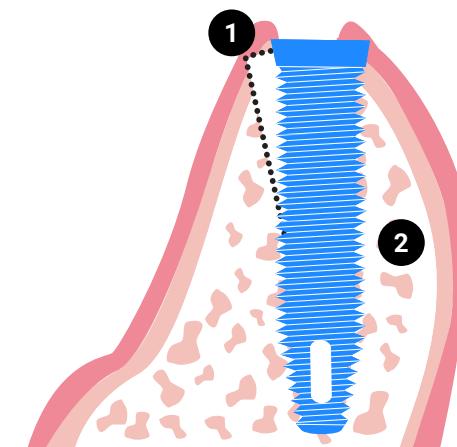
1. Tooth Root
2. Alveolar Bone
3. Periodontal Ligament
4. Clinical Crown



B

Sectioning Root

1. Tooth Root
2. Alveolar Bone
3. Periodontal Ligament



C

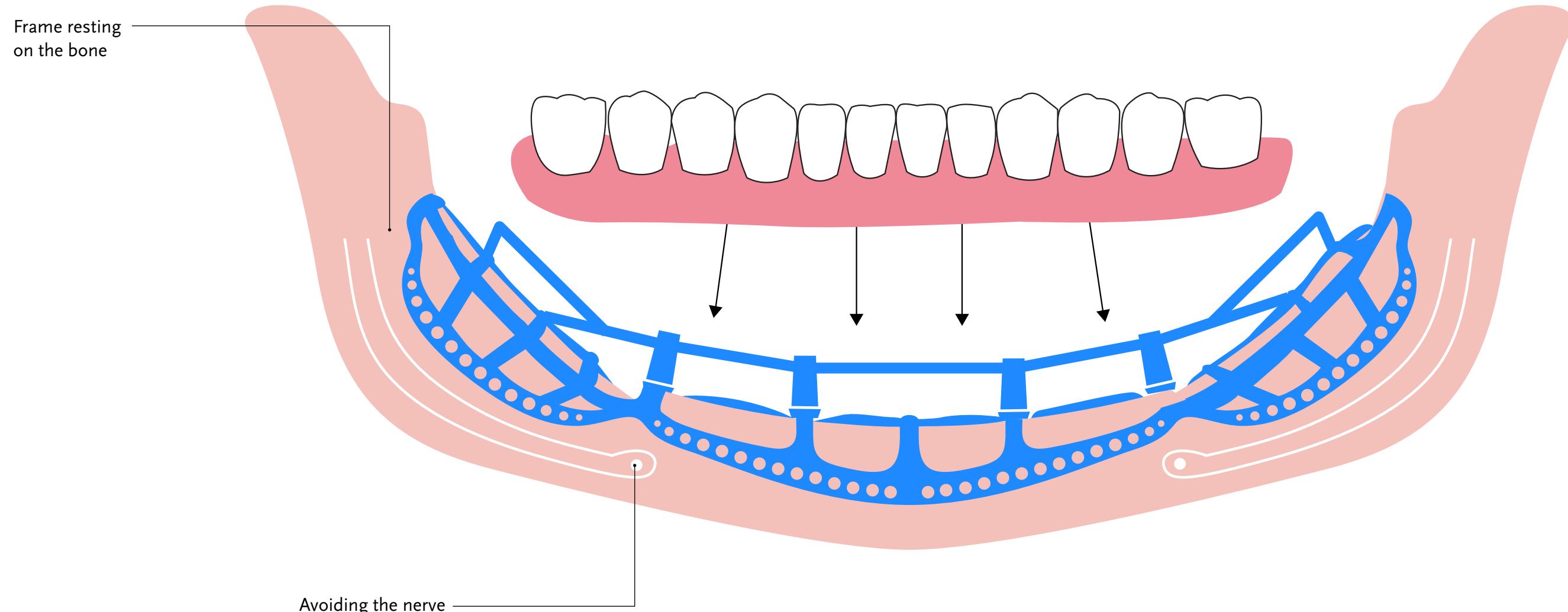
Implant and Root

1. Root Remnant (Shield)
2. Implant

Subperiosteal Implant

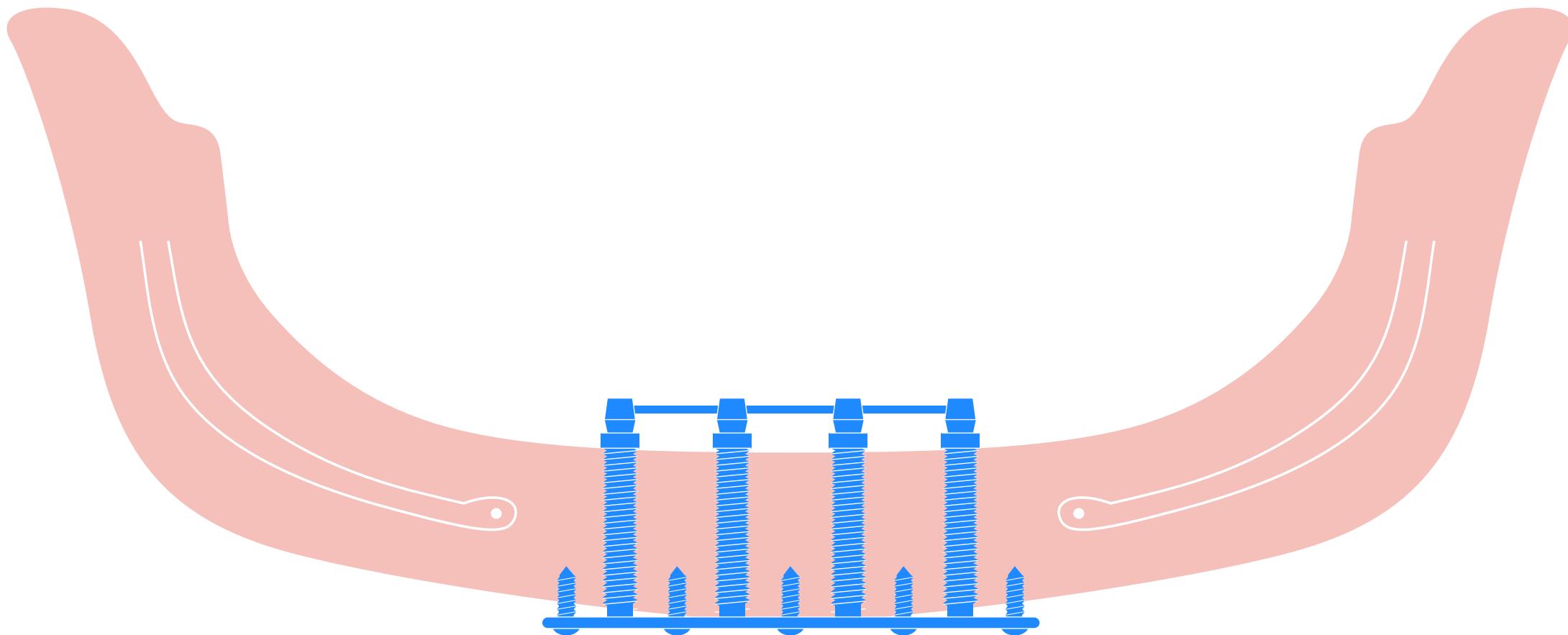
Custom-fabricated implant, designed to rest on the surface of the bone, consisting of permucosal abutments, posts, and intra-oral bars to retain the prosthesis.

See: [Subperiosteal implant](#), [Complete subperiosteal implant](#).



Transosseous or Staple Implant

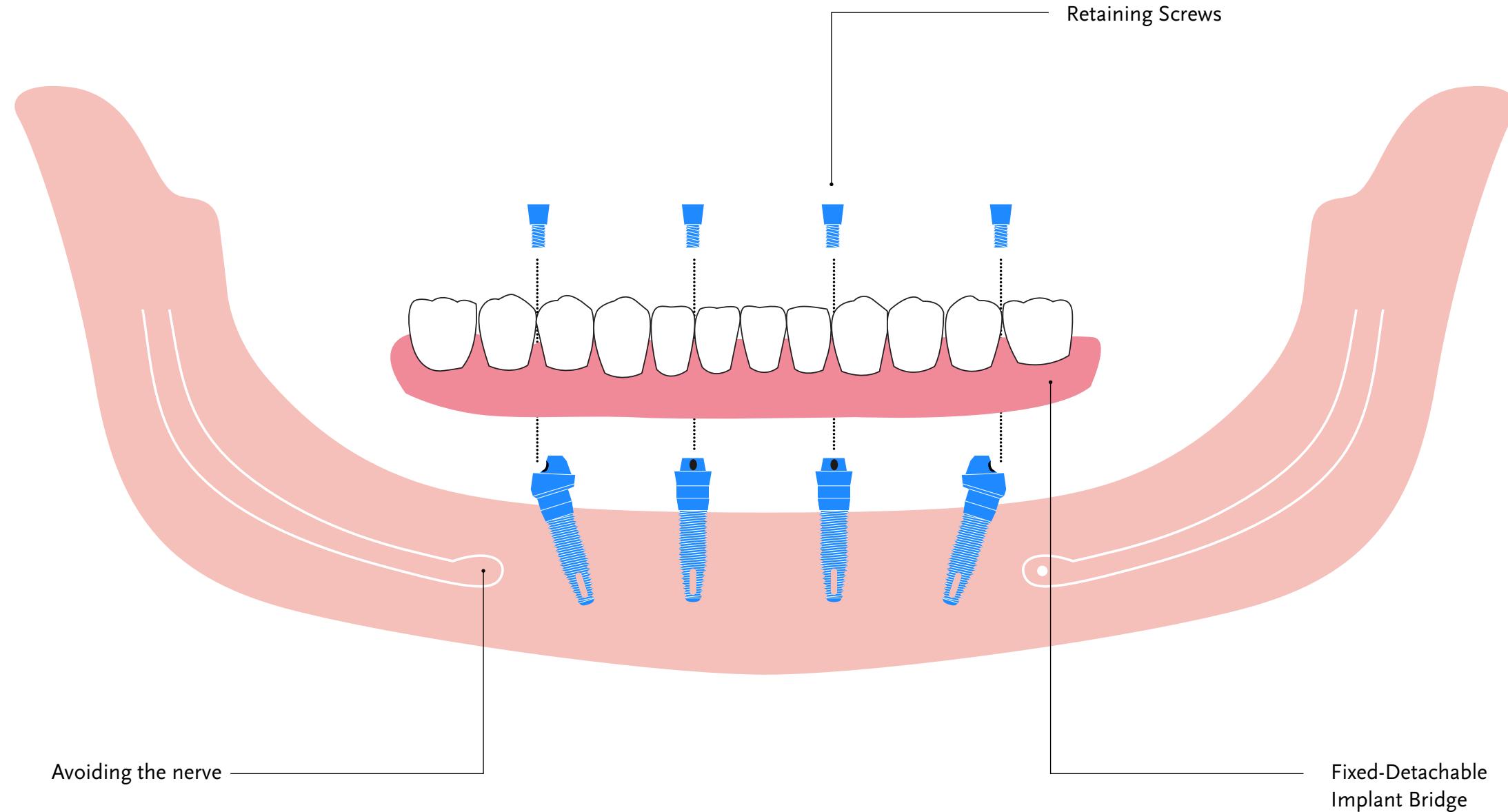
See: [Staple implant](#), [Mandibular staple implant](#).



"All-on-Four" Implant Reconstruction

The fixed-detachable restoration is fabricated and attached to the four implants with four retaining screws, only removable by the dentist.

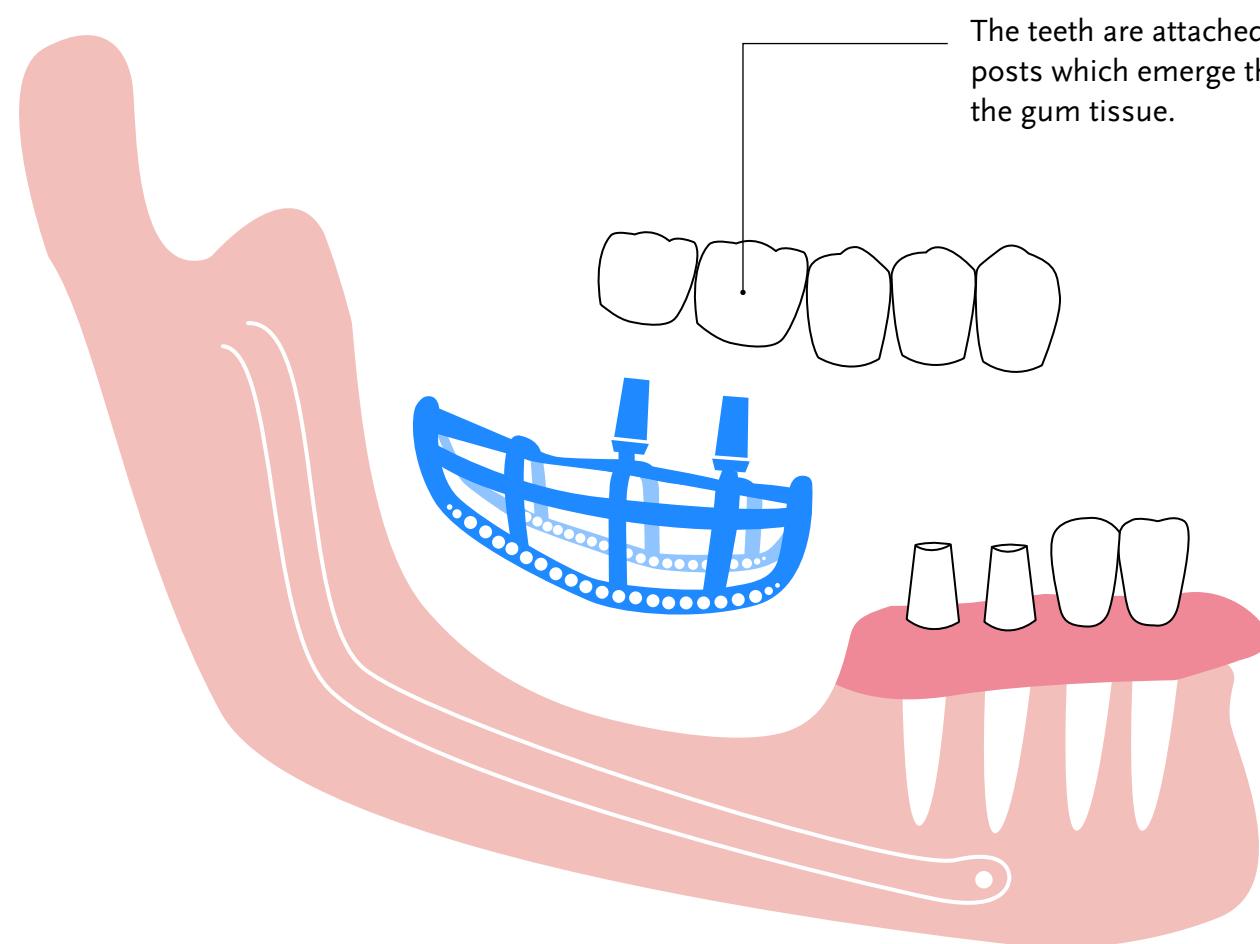
See: ["All-On-4"](#).



Unilateral Subperiosteal Implant

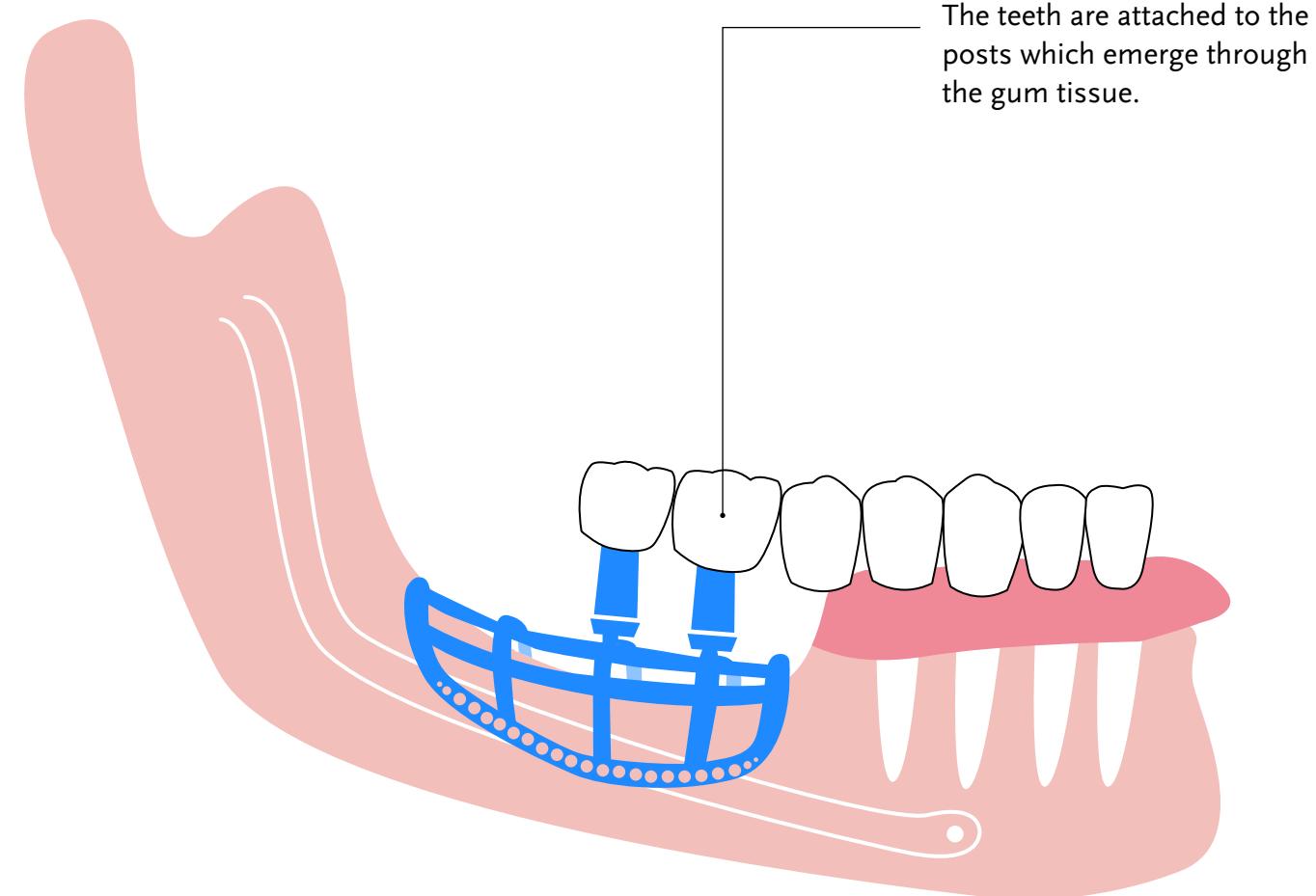
Not Finally Seated Implant.

See: [Unilateral subperiosteal implant](#).



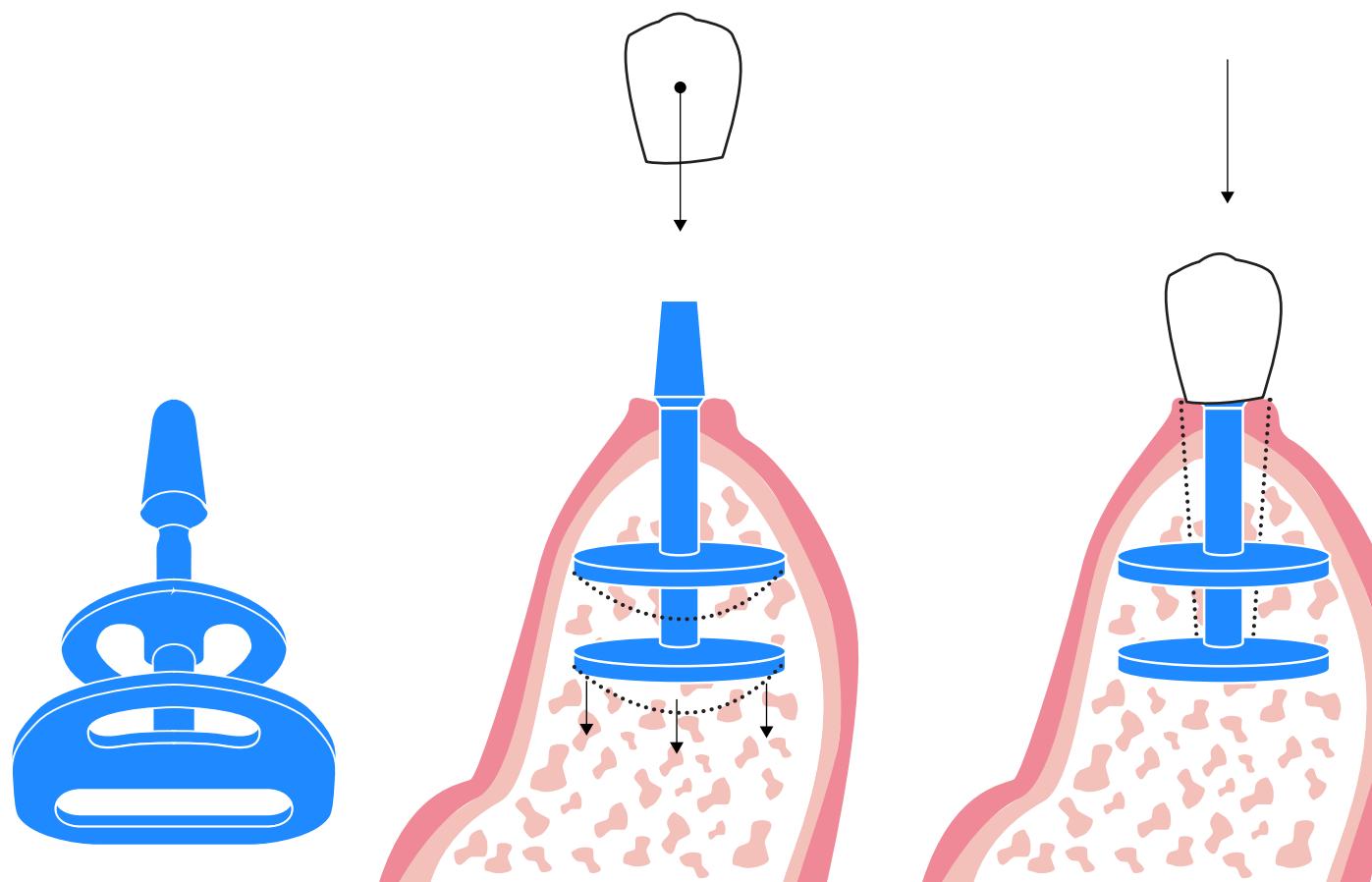
Unilateral Subperiosteal Implant

Finally Seated Implant with teeth.



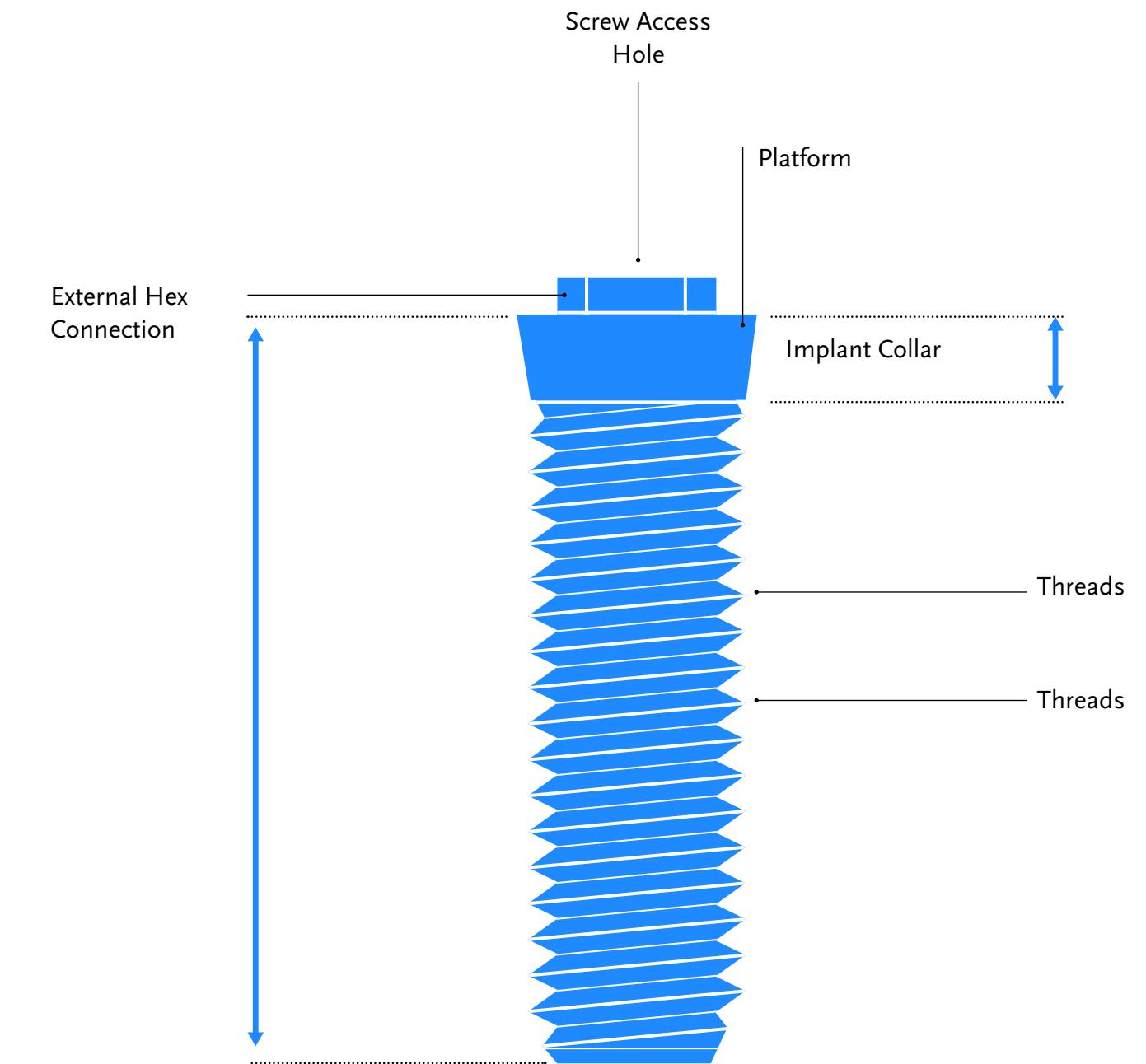
Disc Implant

See: [Disc implant](#).



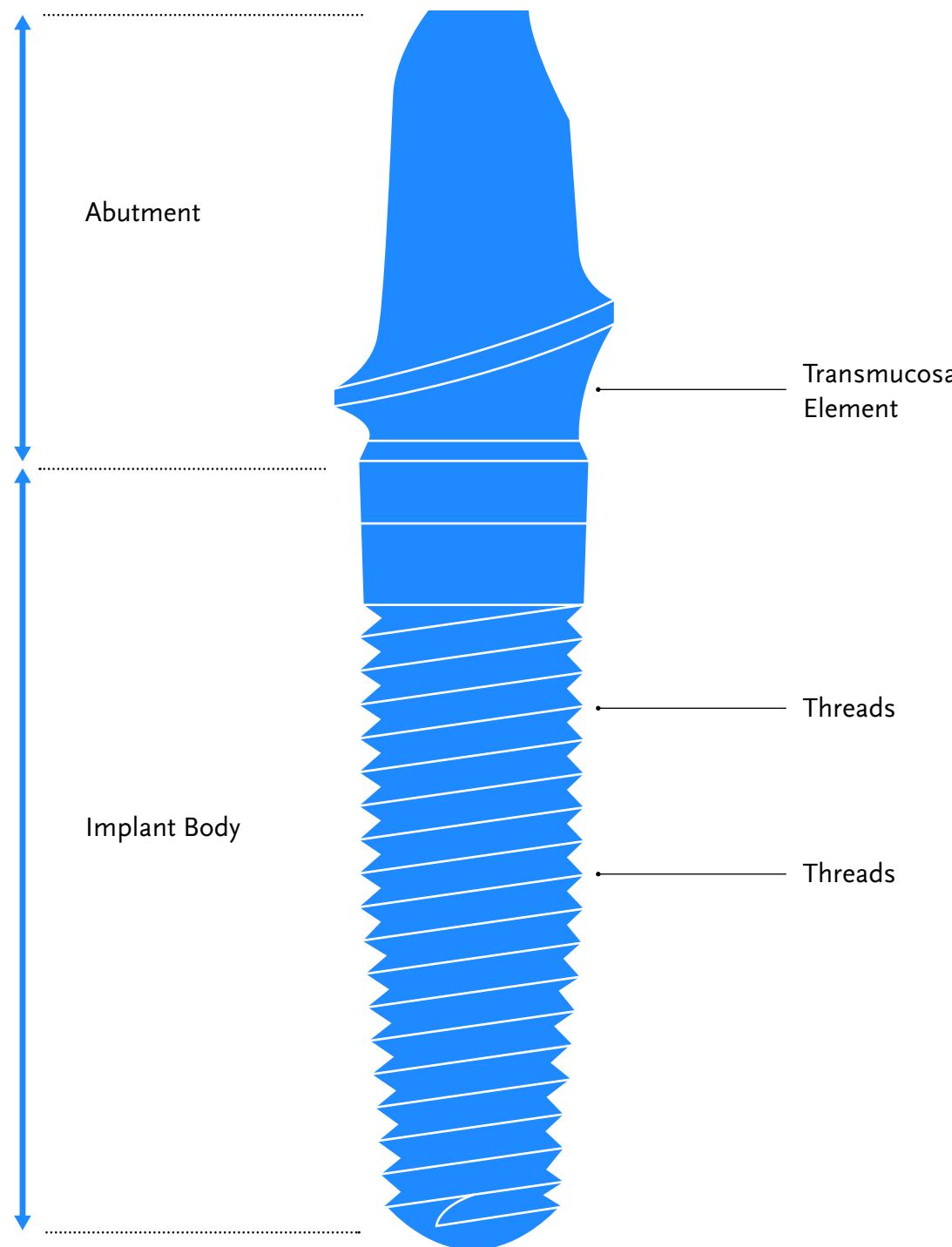
Generic External Hexagon Implant

See: [Cylindrical implant](#), [Endosseous implant](#).



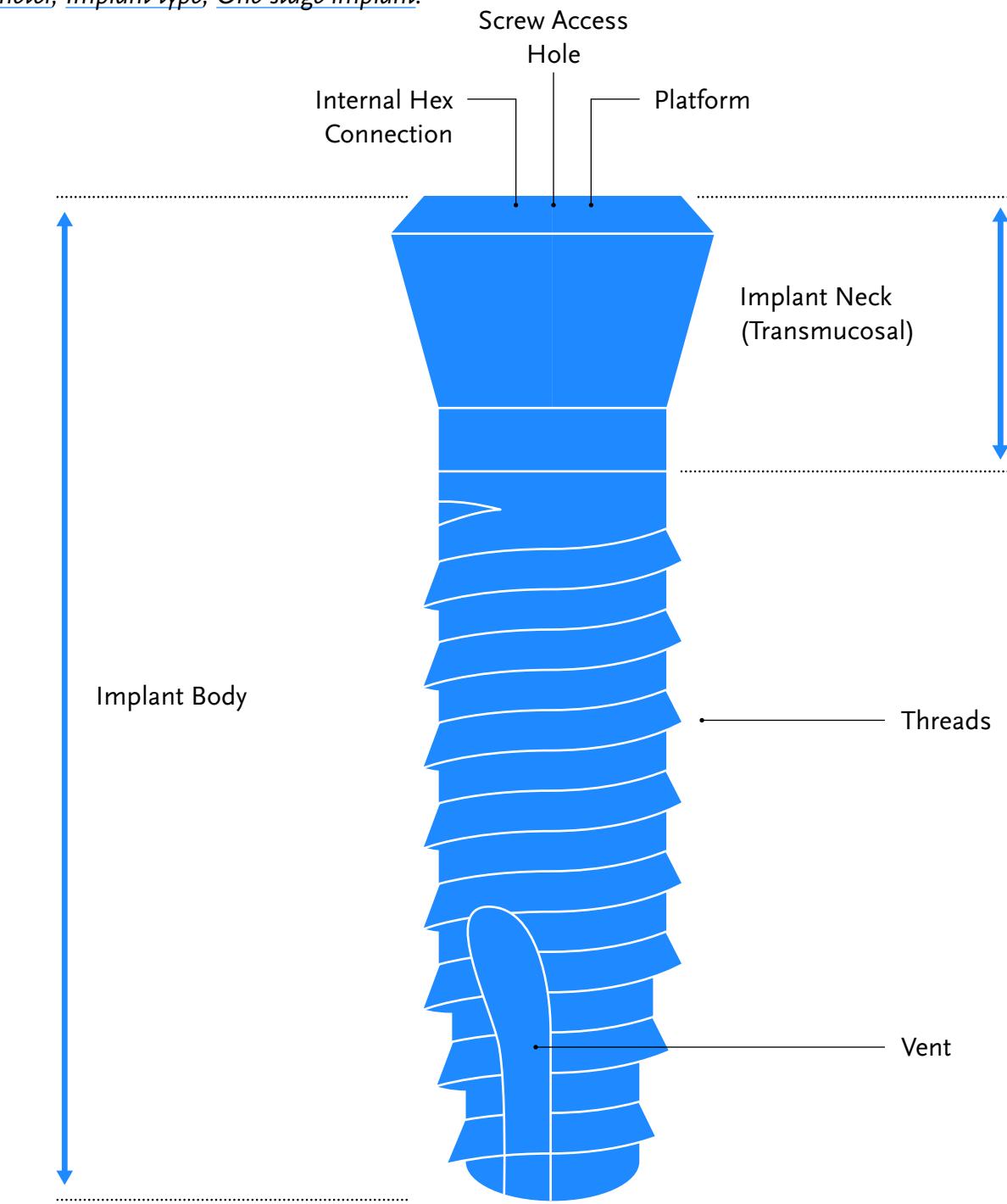
Generic one-Piece Implant

See: [Implant type](#).



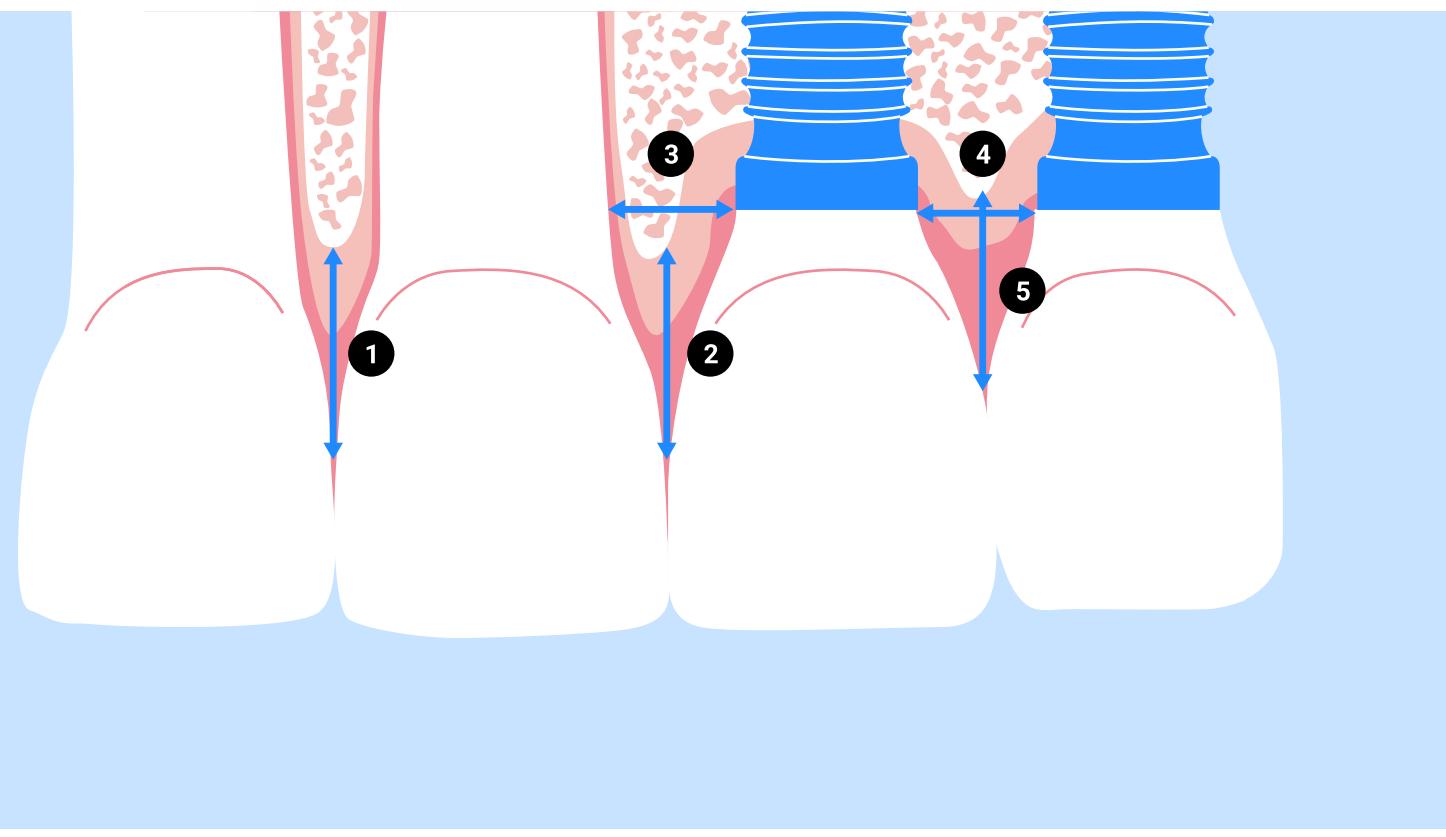
Generic Two-Piece Implant

See: [Implant apex](#), [Implant neck](#), [Major \(thread\) diameter](#), [Implant type](#), [One-stage implant](#).



Papilla

See: Papilla, Interdental papilla, Interimplant papilla.



Legend

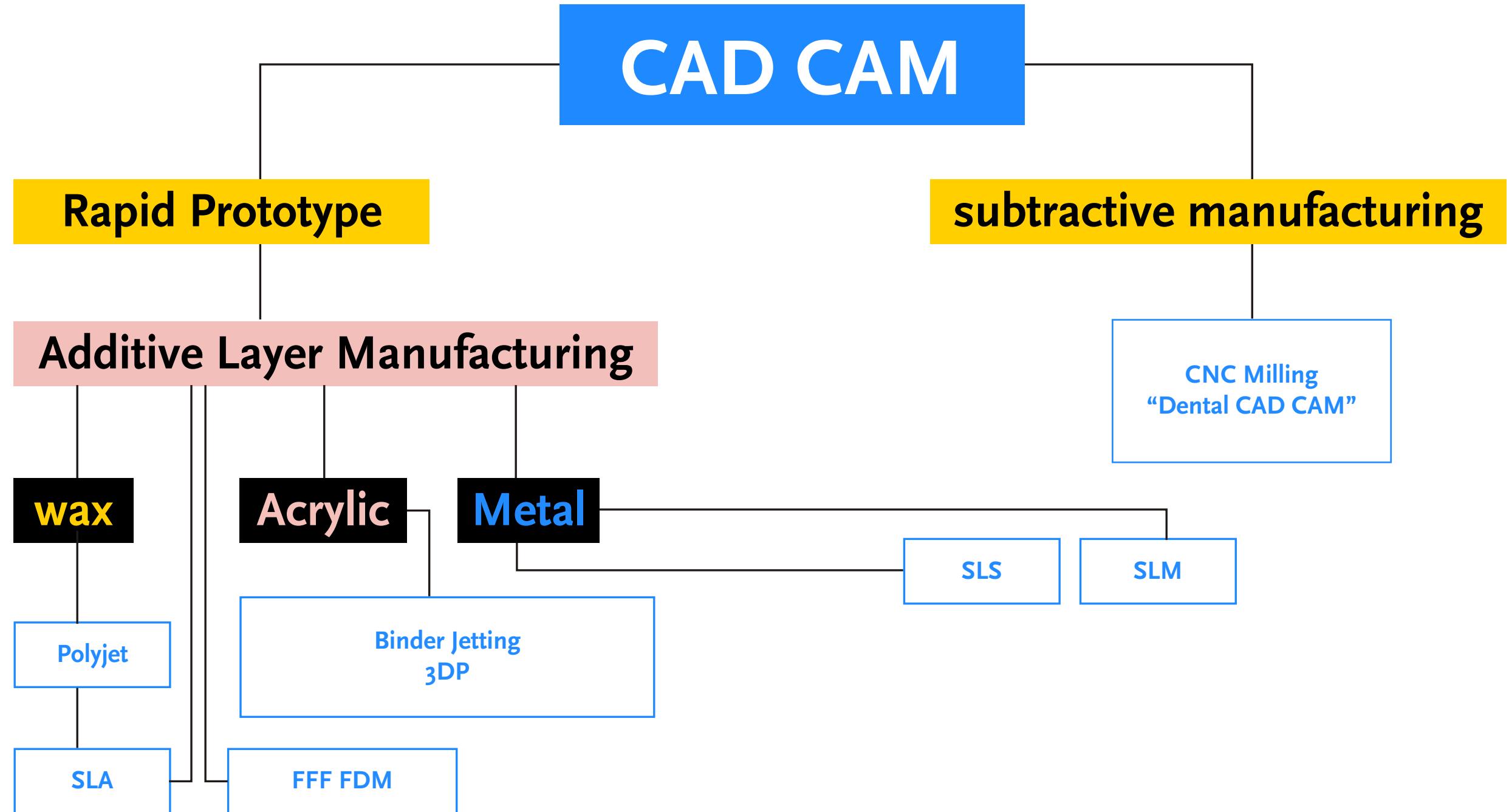
1. The vertical distance from the crest of bone to the contact point between two teeth.
When this distance was 5 mm or less, the papilla completely filled the interdental space almost 100% of the time. When the distance was 6 mm, the interdental space was filled about 55% of the time; and at 7 mm, the interdental space was completely filled about 25% of the time.¹
2. The vertical distance on the tooth side from the crest of bone to the height of the papilla between a tooth and an implant.
 - When the papilla completely filled the interproximal space, this distance was on average 4.5 mm (range: 3.0 to 5.0 mm).²*
 - The interdental papilla was present (at least half the papilla present) when this distance was 4 mm or less.³*
3. The horizontal distance from the implant to the adjacent tooth.
A strong correlation was found between bone loss at adjacent teeth and the horizontal distance implant to tooth. Bone loss at tooth surface was most severe for a horizontal distance of less than 2 mm.⁴
4. The horizontal distance between two adjacent implants.
This distance should be more than 3 mm in order to minimize the vertical loss of the interimplant bone crest. The lateral distance D from the implant to the crest of the ridge was 1.34 mm ($SD = 0.36$ mm) and 1.40 mm ($SD = 0.60$).⁵
5. The vertical distance from the crest of bone to the height of the interproximal papilla between adjacent implants.
Only 2, 3, or 4 mm of soft tissue height (average 3.4 mm) can be expected to form over the interimplant crest of bone.^{6,7}

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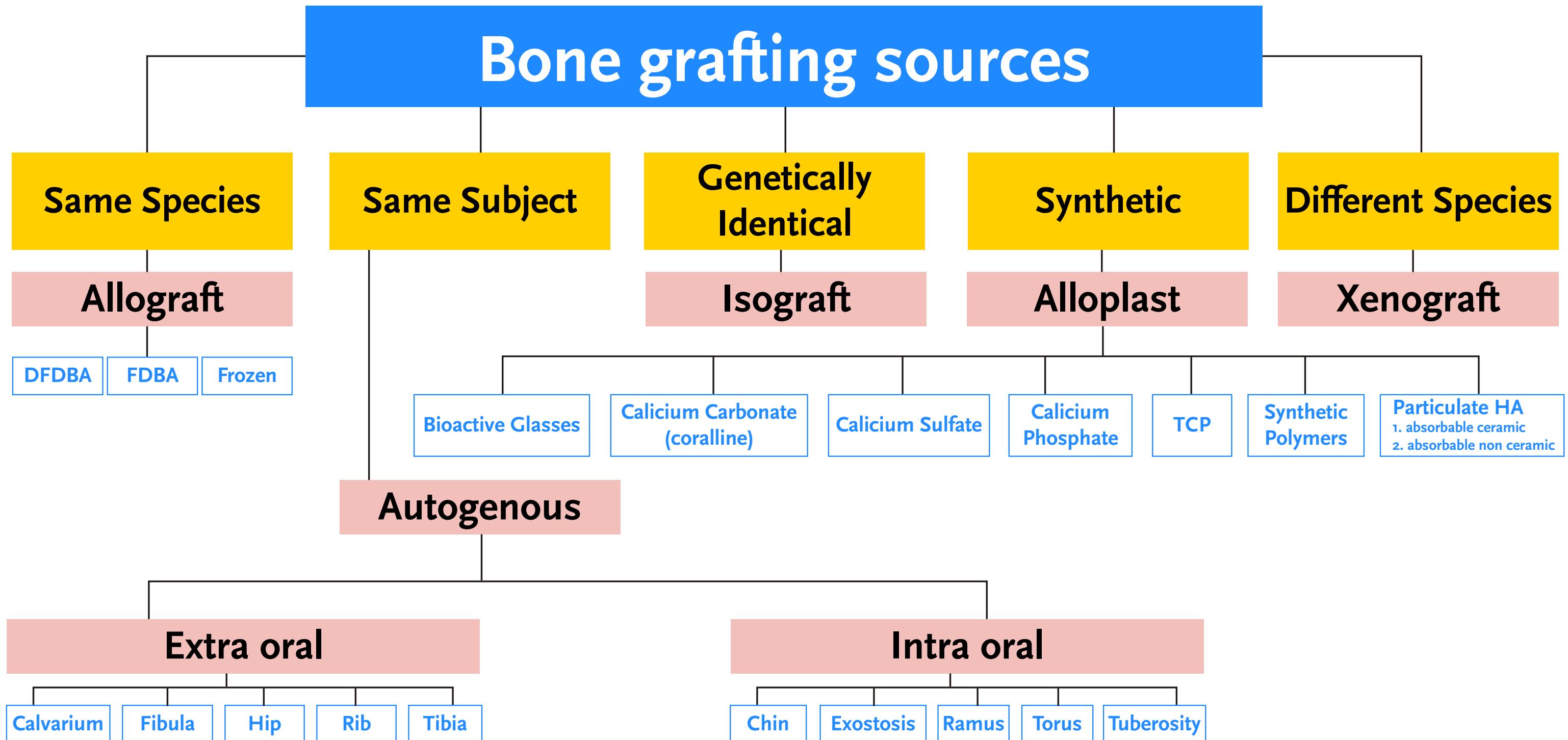
CAD CAM

See: [CAD/CAM, 3-D printing](#).



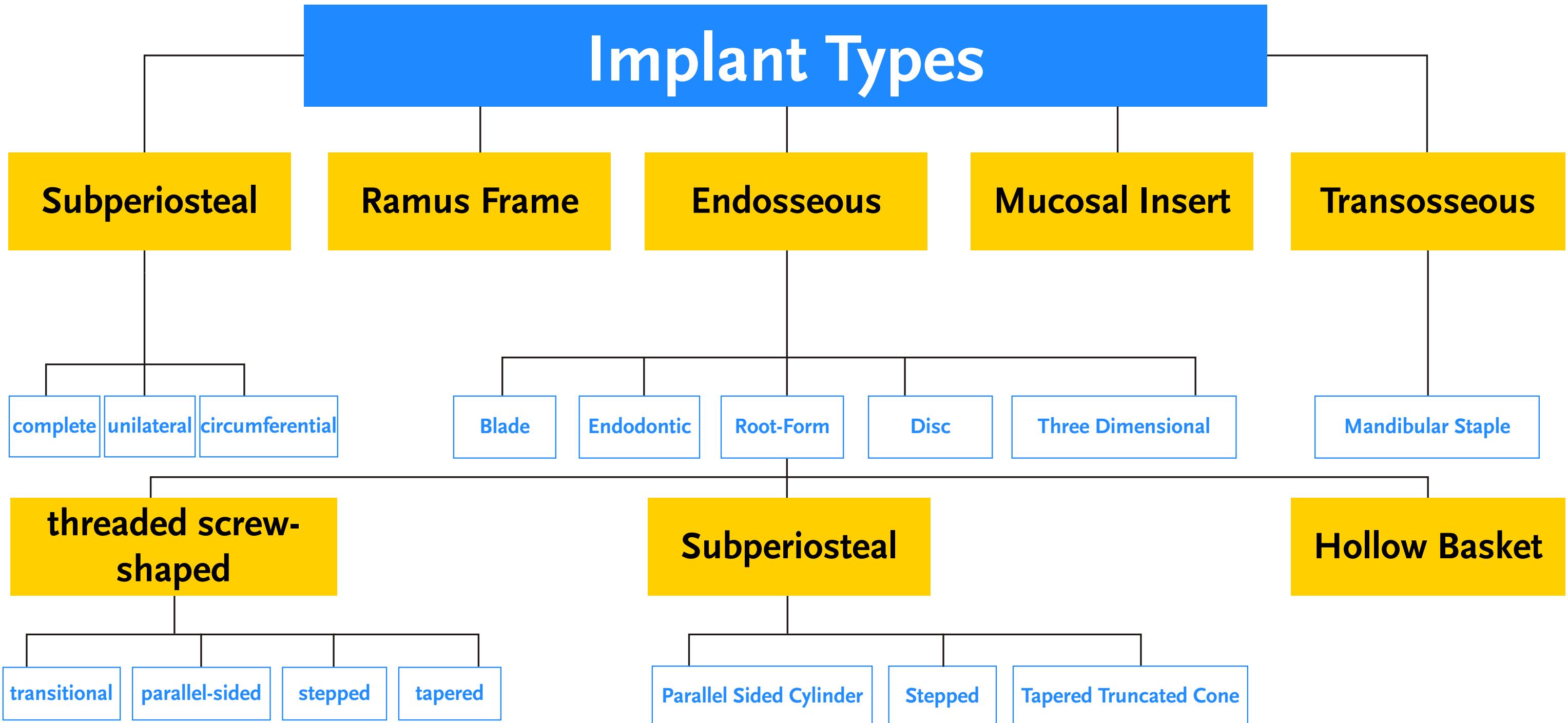
Bone Grafting Sources

See: [Bone grafting](#).



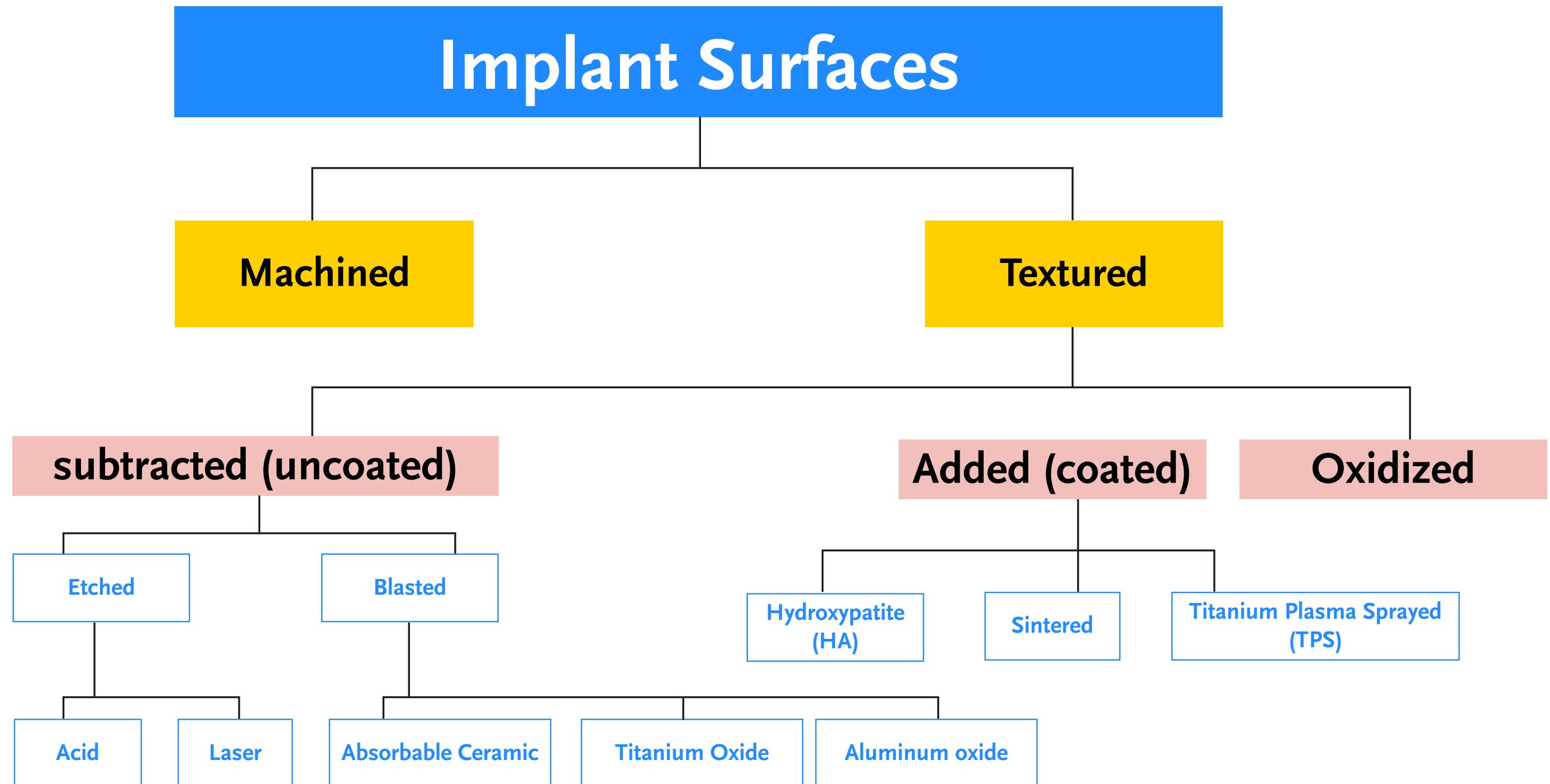
Implant Types

See: [Implant type](#).



Implant Surfaces

See: [Implant surface](#), [Blasted implant surface](#).



Biologic Width

See: [Biologic width](#).

Teeth		Implant							
		Submerged Protocol					Nonsubmerged Protocol		
SD JE CT IAJ-B	Gargiulo et al.1960	Berglundh et al.1991	Berglundh et al.1991	Abrahmsson et al. 1997		Hermann et al.2000		cocharn et al.1997	
			No abutment disconnection reconnection		Abutment disconnection reconnection			N/A	
			Crestal placement iaj at the bone crest			Supracrestal placement iaj 1 mm above the bone crest	Supracrestal placement iaj 1 mm above the bone crest	Unloaded	Loaded 2 months
	0.41-1.09 Average 0.69								
0.44-1.56 Average 0.97	2.05 ± 0.06*	2.14 ± 0.47**	2.04 ± 0.22***	1.65 ± 0.24***				0.49 ± 0.32	0.50 ± 0.30
0.69-1.49 Average 1.07	1.12 ± 0.03	1.66 ± 0.23	1.28 ± 0.11	0.85 ± 0.26				1.16 ± 0.47	1.44 ± 0.41
N/A	N/A		0.78 ± 0.17	1.49 ± 0.19	1.57 ± 0.22	2.64 ± 0.24	1.25 ± 0.40	2.90 ± 0.52	2.91 ± 0.49
									2.95 ± 0.68

Comparison of Tooth and Implant Support Structures

Misch CE. Contemporary Implant Dentistry. 3rd ed. St. Louis: Mosby; 2008.

Structure	Tooth	Implant
Connection	Cementum, bone, periodontium	Osseointegration
Junctional epithelium	Hemideosmosomes and basal lamina	Hemideosmosomes and basal lamina
Connective tissue	Thirteen groups: perpendicular to tooth surfaces ↑ Collagen ↓ Fibroblasts	Only two groups: parallel and circular fibers No attachment to implant surface and bone ↑ Collagen ↓ Fibroblasts
Biological width	2.04 to 2.91mm	3.08mm
Vascularity	Greater, supraperiosteal and periodontal ligament	Less, periosteal
Probing depth	3mm in health	2.5 to 5.0mm (depending on soft tissue depth)
Bleeding on probing	More reliable	Less reliable

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