Neodent® NeoArch®

Immediate Full-Arch Solution

Surgical and Prosthetic Manual

NEODENT
A Straumann Group Brand

Smile for everyone solution

NeoArch® Solution

Helix® Implant

CONTENTS

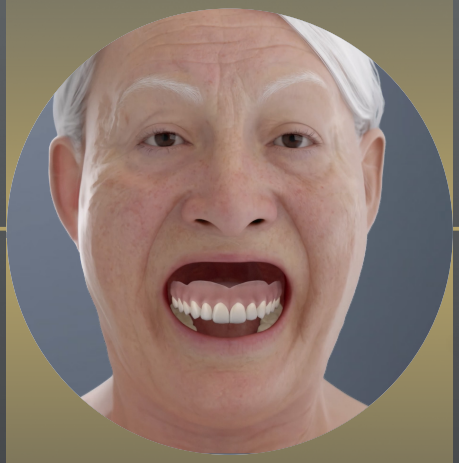
NEODENT® NEOARCH®
IMMEDIATE FULL-ARCH SOLUTION

Increasing expectations for shortened treatment duration represents a significant challenge for dental professionals, especially in patients with anatomical deficiencies. The Neodent® Neoarch® offers an optimized solution for immediate treatment protocols in edentulous patients, offering state-of-the-art resources for digital and conventional workflows. Improve your patient's satisfaction and quality of life by restoring function and esthetics.[1]

COMPREHENSIVE WORKFLOWS FOR IMMEDIATE RESULTS

1

COMMITTED TO THE EDENTULOUS PATIENT JOURNEY



Find the ideal workflow for your edentulous patient with straightforward results and increased patient acceptance.

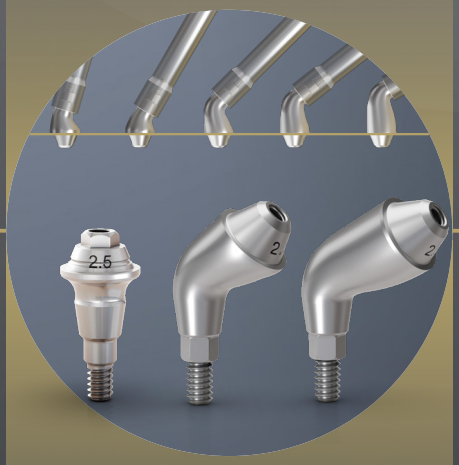
2

ANATOMICALLY DRIVEN SOLUTION

Designed for predictable immediate treatment in different densities and atrophy levels of the residual alveolar bone.

3

IMMEDIATE NATURAL-LOOKING ESTHETICS



Several gingival heights and angulations combined with an anatomical shape, short cone and wide angle, resulting in an optimized emergence profile.

IMMEDIATE FUNCTION RESULTING IN SHORTER TREATMENT TIMES.

| Different implant techniques to avoid the use of grafting procedure.[2]
| Optimized implant design to achieve high primary stability in all bone types.[3]

IMMEDIATE NATURAL-LOOKING ESTHETICS WITH VERSATILE RESTORATIVE OPTIONS.

| A broad gingival height abutment range to meet patient's needs.
| Options of straight and angled abutments (17°, 30°, 45°, 52 and 60°).

IMMEDIATE PEACE OF MIND THANKS TO A STABLE FOUNDATION.

| One connection regardless of the diameters.
| Unique connection combining platform switching associated with a deep 16° Morse taper including an internal indexation.

WHETHER DIGITAL OR CONVENTIONAL WORKFLOW, YOUR FULL ARCH JOURNEY STARTS HERE

| The first step for immediacy, simple as it should be with NeoConvert™: an optimized technique for denture conversions.
| Deliver the best for your patient through the Centralized Production Center* or In-house workflows.

*Check availability in your region

5

DIGITAL OPTIONS TO STREAMLINE YOUR CLINICAL PRACTICE

Immediate personalized leverage neoarch digital resources for enhanced results in your cases.

6

COMPREHENSIVE RESTORATIVE SOLUTIONS

Meet patient expectations with different possibilities of workflows and materials: customize frameworks for provisional or final restorations.

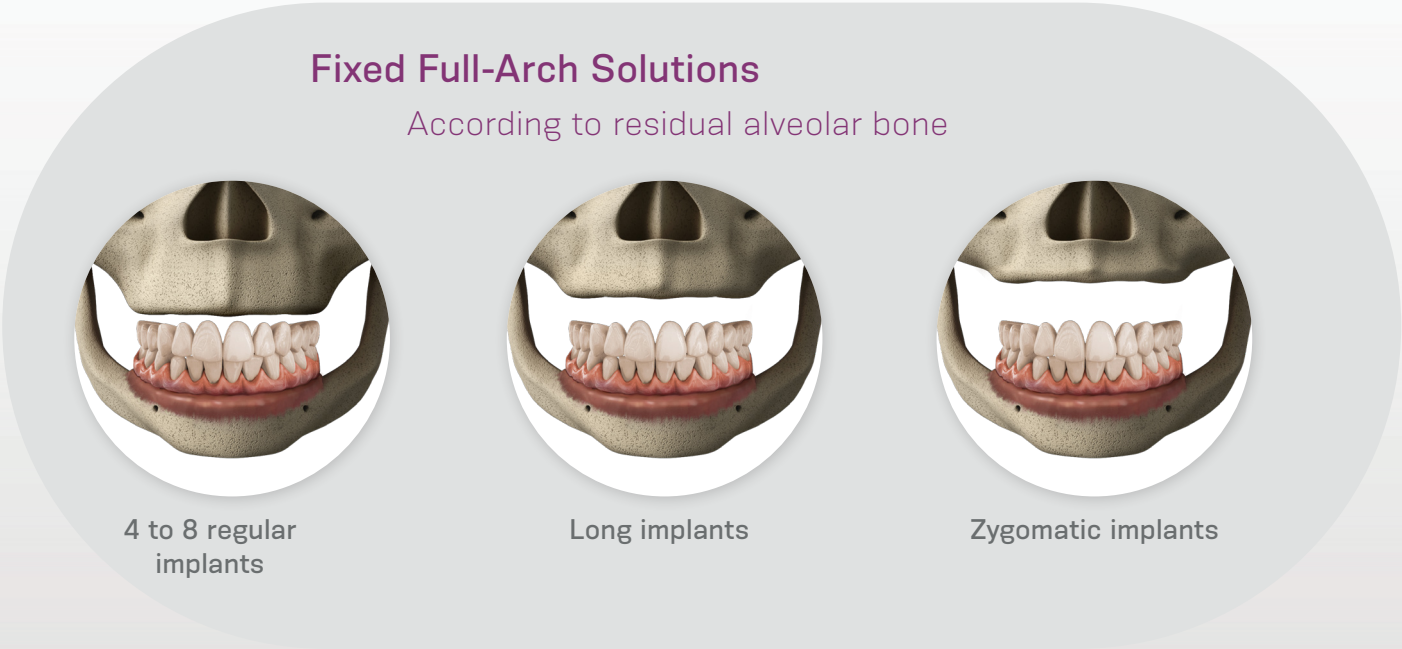
INTRODUCTION

TREATMENT FOR FULL-ARCH REHABILITATION WITH IMPLANTS

The complete loss of natural teeth affects the elderly in particular and is a globally prevalent tissue. Around the world, about 30% of people aged 65–74 have none of their natural teeth[4]. Thus, regardless of any critical anatomical situation, patients expects for a proper functional and esthetical rehabilitation with a high level of comfort.

In order to address the requirements and expectations of patients seeking fast, convenient, and reliable solutions for a full dental replacement, Neodent® NeoArch® are fixed full-arch prosthetic and surgical solutions designed to implants installation according to the remain atrophic alveolar bone structure.

In order to provide proper implant distribution according to different residual bone heights, techniques can be used supporting a fixed full-arch rehabilitation. This manual outlines the Neodent® products for full-arch rehabilitations from 4 to 8 implants, long implants, or even zygomatic implants used in different clinical approaches.



Different residual bone heights *versus* implant techniques.

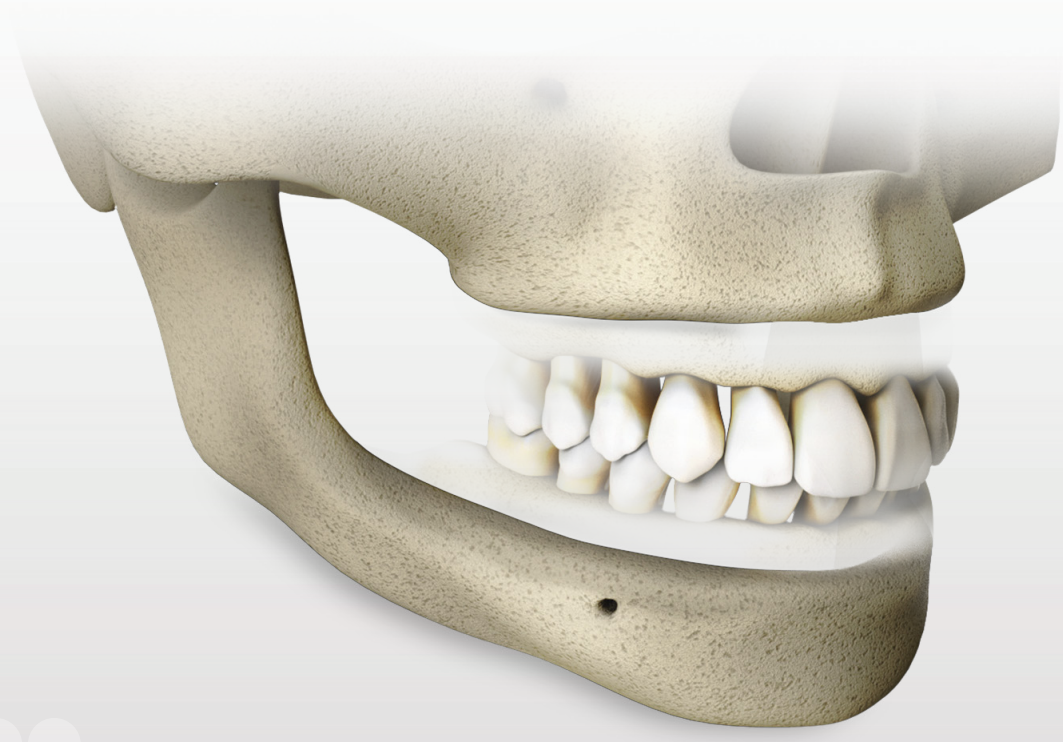
PRE-OPERATIVE PLANNING

ANATOMICAL CONSIDERATIONS

High success rates have in recent years been reported with the use of four implants in the rehabilitation of edentulous patients[1, 3, 5, 6]. However, certain technical aspects have to be considered before surgery in order to help ensure treatment success[7,8]. All full-arch reconstruction starts with a clear and previously-defined prosthetic plan, developed according to the patient's remaining structures, including residual alveolar bone and smile line.

Residual Alveolar Bone

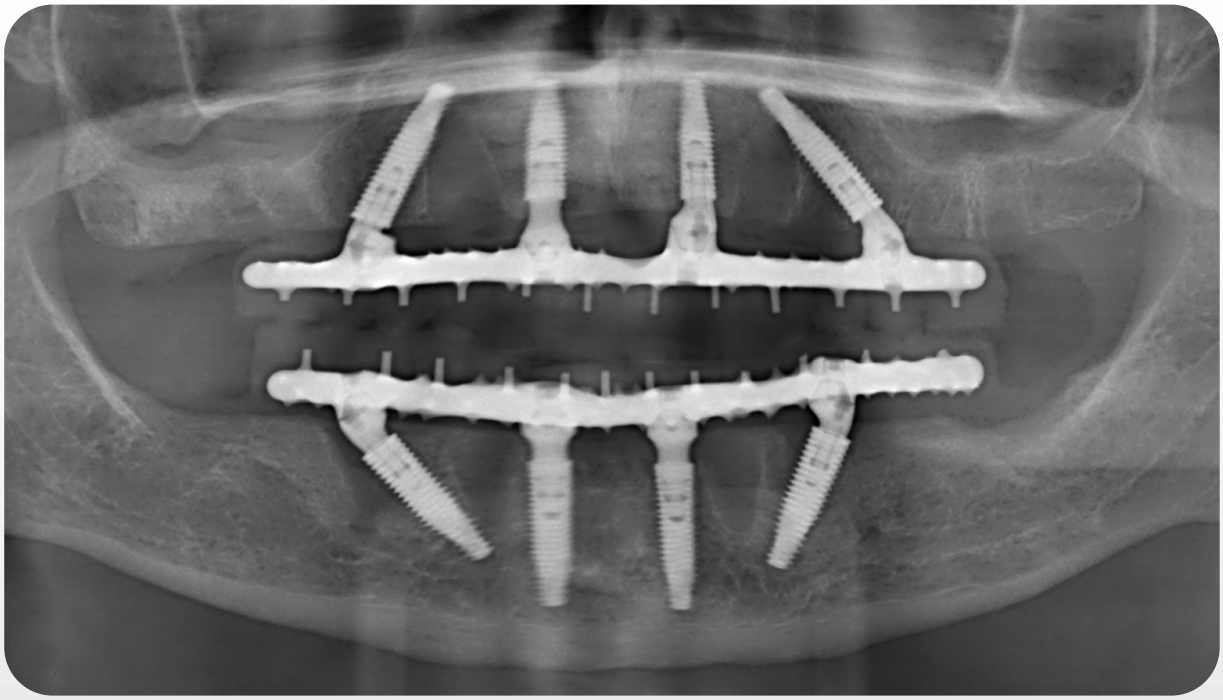
The residual alveolar ridge undergoes physiological resorption after complete tooth loss. This resorption can be located in different zones in the arch. Patients presenting atrophic conditions are indicated to receive fixed full-arch rehabilitations. Therefore, the use of implants became important to retention and stability of the entire system.



Mandible and maxilla bone resorption after complete tooth loss.

ANATOMICAL CONSIDERATIONS

The maxilla has a lower bone density than the mandible, especially when compared at the anterior mandible region between the mental foramen region. Therefore, bicorticalization is a good method for achieve high primary stability of implants in maxilla. In addition, tilted distal implants, zygomatic, or long implants are an effective strategy to enhance contact area with remaining bone avoiding anatomical challenging structures and allowing bicorticalization. At the same time, anterior implants are limited by the nasal cavity and sometimes can be placed in a tilted fashion, also with the apex distally angled, which results in the same benefits, and is known as the M-4 treatment[9]. Thus, if there is sufficient residual bone structure at the anterior region, it may be used long implants to achieve bicorticalization further then the alveolar ridge.



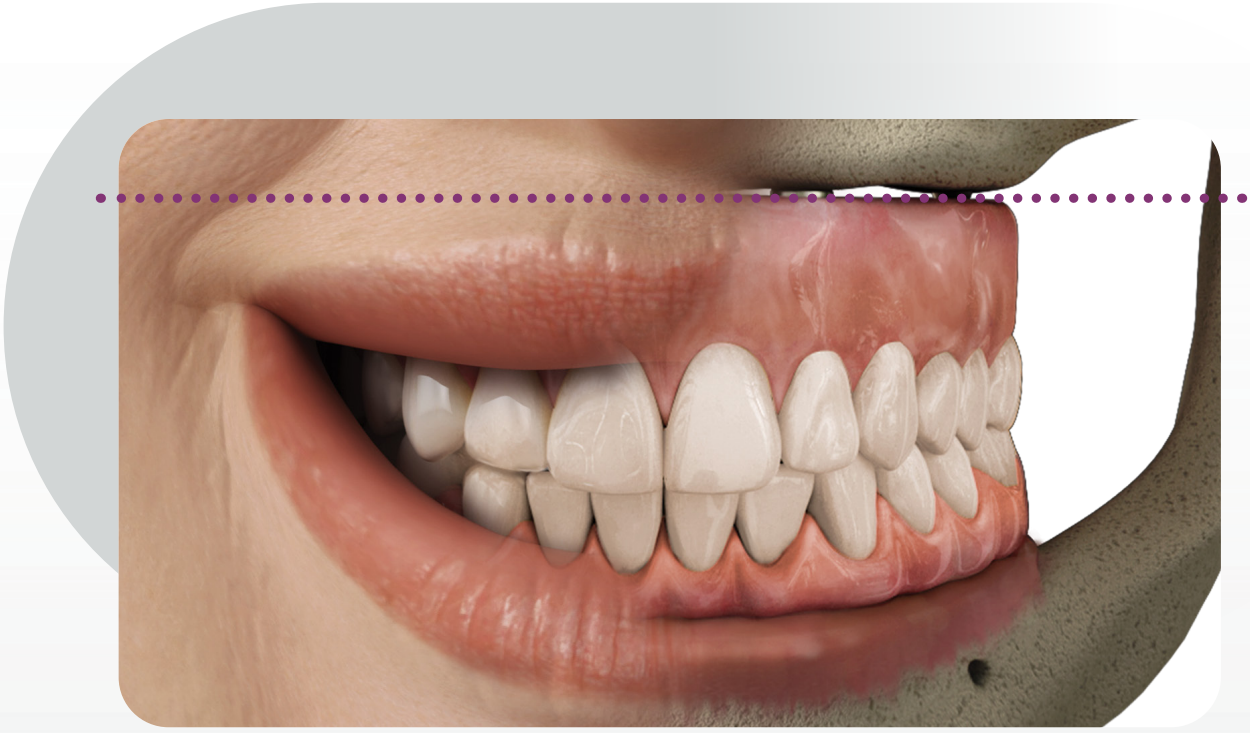
* Patient treatment data authorized for publish.

Higher bone density for positioning implants on sinus and nasal cavity walls.

ANATOMICAL CONSIDERATIONS

Smile Line

The patient's smile line determines the esthetic challenges that will drive important surgical and prosthetic procedures when the aim is a natural looking solution. Both characteristics, the smile line combined with the residual alveolar ridge height, dictate bone horizontal osteotomy, implant positioning and prosthetic extension (with or without "pink esthetic") based on esthetics space for the restoration, and hygiene of the final prosthesis.



Rehabilitation extension according to patient's structures.

The upper lip defines the patient's smile line and the contact between bridge and remaining mucosa should never be exposed, otherwise there will be esthetical problems in the final restoration. The upper lip must cover the transition line between bridge and remaining mucosa independent of the residual bone structure.

ANATOMICAL CONSIDERATIONS

During the planning stage, it is important to evaluate the volume of patient's residual alveolar bone.

VOLUME OF RESIDUAL ALVEOLAR BONE

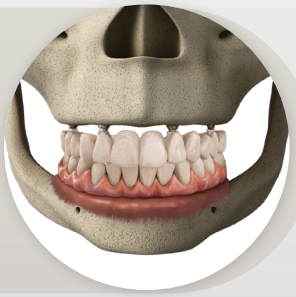
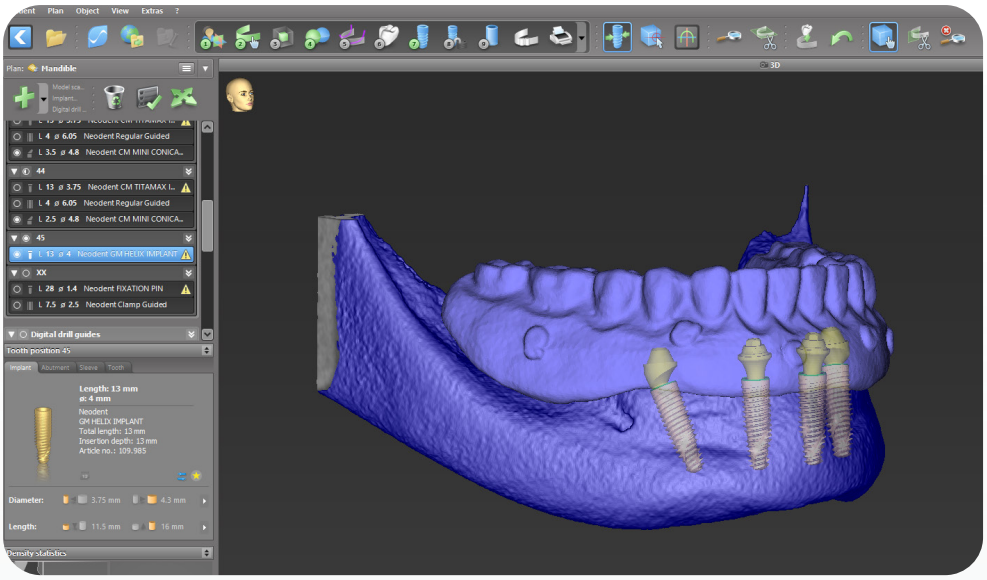
	small	mid	high
BEFORE			
Indication for horizontal osteotomy	Not indicated if the bone is in harmony with the upper lip and even.	Indicated to flat the bone to avoid esthetics and functional problems.	Not indicated if the bone is in harmony with the upper lip and there is prosthetic space for the restoration (see also smile line).
Smile Line High	No osteotomy if the remaining bone is parallel to the upper lip, even and covered by the upper lip.	No osteotomy if the remaining bone is parallel to the upper lip, even and covered by the upper lip.	No osteotomy if the remaining bone is parallel to the upper lip and even. Osteotomy is only indicated if the remaining bone isn't in harmony with the upper lip.
Smile Line Low	No osteotomy if the remaining bone is even.	No osteotomy if the remaining bone is even.	No osteotomy if the remaining bone is covered under the upper lip, even and there is space for the prosthesis.
AFTER			
Type of restoration	Large amount of pink esthetic in the restoration.	Small amount of pink esthetic in the restoration.	No pink esthetic.

Table 1. Previously uneven smile line between crowns and mucosa due to bone extrusion and smile line after osteotomy for fixed full-arch rehabilitation.

DIGITAL 3D PLANNING

For a successful full-arch rehabilitation, the initial prosthetic planning constructed with the aid of a tomography guide according to proper occlusion using Cone Bean Computed Tomography (CBCT) images will define the proper position of implants, and takes into consideration anatomical structures, especially for complex rehabilitation. If the patient presents a well-established conventional complete denture, it also can be used as a guide and as an immediate provisional implant-supported prosthesis. In addition, specific planning software can be used to determine implant positions.



*Data extracted from coDiagnostiX® software.
*Patient treatment data authorized for publish.

Implant distribution according to bone availability and prosthetic planning.

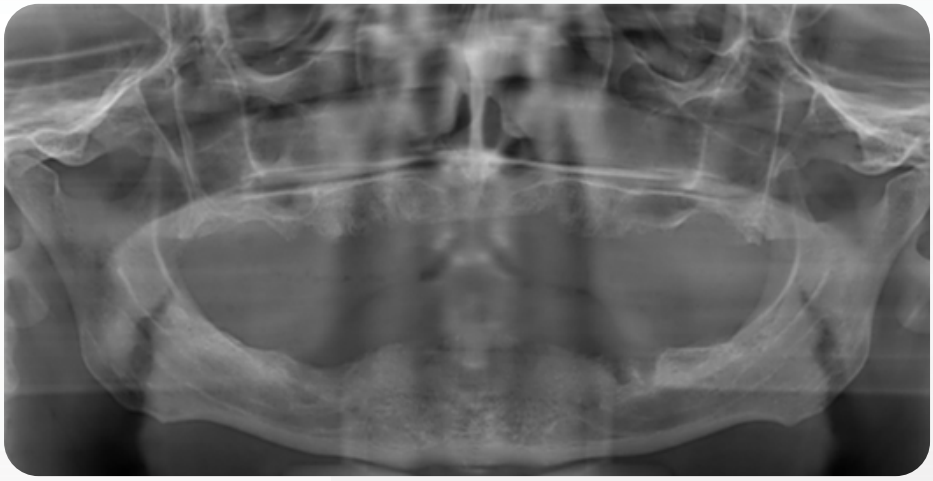
IMPLANT DISTRIBUTION AND PROSTHESIS DEFINITION

Implant distribution is an important factor to be considered in full-arch bridges as it supplies mechanical result on the system. Anteroposterior implants placement and occlusion should be balanced to avoid stress concentrations[9,10]. Bone condition, such as density, thickness, and anatomical structures are responsible for the implant distribution planning. Therefore, the posterior maxilla is considered the most difficult and problematic intraoral area for treatment with osseointegrated implants, presenting deficient bone quality and quantity, surgical access, and biomechanics (greater masticatory forces)[11,12].

There are many options for rehabilitating a fixed full-arch, and according to remaining structures and the professional preferences, from 4 to 8 regular straight or tilted implants, long implants, or the addition of zygomatic implants can be used to provide a fixed solution and enhance patient masticatory performance and quality of life. The use of only four regular implants with the distals tilted allows more options for the final position and anteroposterior distribution when planning the rehabilitation[9,10] and is normally used when facing a high residual alveolar ridge. For extremely atrophic ridges in maxillary bone, implant placement on denser cortical bone such as pterigomaxillary

and zygomatic regions can provide adequate implant support and eliminate procedures such as sinus augmentation, supplementals bone block grafts, and the use of a large number of implants[13,14].

Clinicians can define implant distribution based on the size of the cantilever where distal implants are initially determined. The medial implants can then be placed as far anterior as possible to spread the implants along the arch and distribute forces equally across the entire arch and implants. The use of only four implants allows more options for the final position and anteroposterior distribution when planning the rehabilitation[9,10] and is normally used when facing a high residual alveolar ridge.



*Patient treatment data authorized for publish.

Panoramic radiography of an edentulous patient.

Note: Anterior/posterior implant distribution on the arch should be carefully evaluated because this determines stress distribution of the system. For more information see **Cantilever planning** topic, further in this manual.

Distal implants should be placed before anterior implants as they determine the posterior limits of implant distribution and are closer to key anatomical structures that must be avoided, such as the mental foramen in the mandible, nasal cavity and sinus for the maxilla. Because the posterior tilted implants installation occurs around the 1st and 2nd pre-molar region, a short cantilever is indicated to extend until the 1st molar, which decreases stress on the peri-implant cortical bone and increases the rehabilitation's longevity. Therefore, the prosthesis should extend to a maximum of 12 teeth.

In addition, with immediately loaded full-arch implant restorations, a fully balanced occlusal scheme is recommended to achieve a physiological occlusion. It is suggested that the cusps are flattened, and the articulation is balanced. This spreads the load on all implants and reduces risks of technical fractures. Balanced occlusion implies bilateral simultaneous anterior and posterior contact in centric and eccentric positions, in which the loading forces are distributed over a large area. If the full arch opposes natural teeth, it is recommended that the natural teeth are adjusted to obtain group function and not canine guidance." [15]

REHABILITATION POSSIBILITIES

NeoArch® full-arch solutions brings from planning phase through final restoration a clear and complete portfolio workflow to aid the clinician in different bone availability and surgical techniques. Find a proposition of workflow for all treatments options:

1 4 TO 8 REGULAR IMPLANTS

- *Helix GM® implants - designed to achieve immediacy*
- *Surgical procedures and implant placement*
- *Abutment selection*

2 LONG IMPLANTS

- *Helix GM® Long implants Techniques*
- *Surgical procedures and implant placement*
- *Abutment selection*

3 ZYGOMATIC IMPLANTS

- *Zygoma GM™ Implants*
- *Zygoma S GM™ Implants*
- *Surgical procedures and techniques*
- *Abutment selection*

4 PROSTHETIC PROCEDURES

- *Immediate provisionalization*
- *Digital and Conventional Workflow*
- *Final restoration*

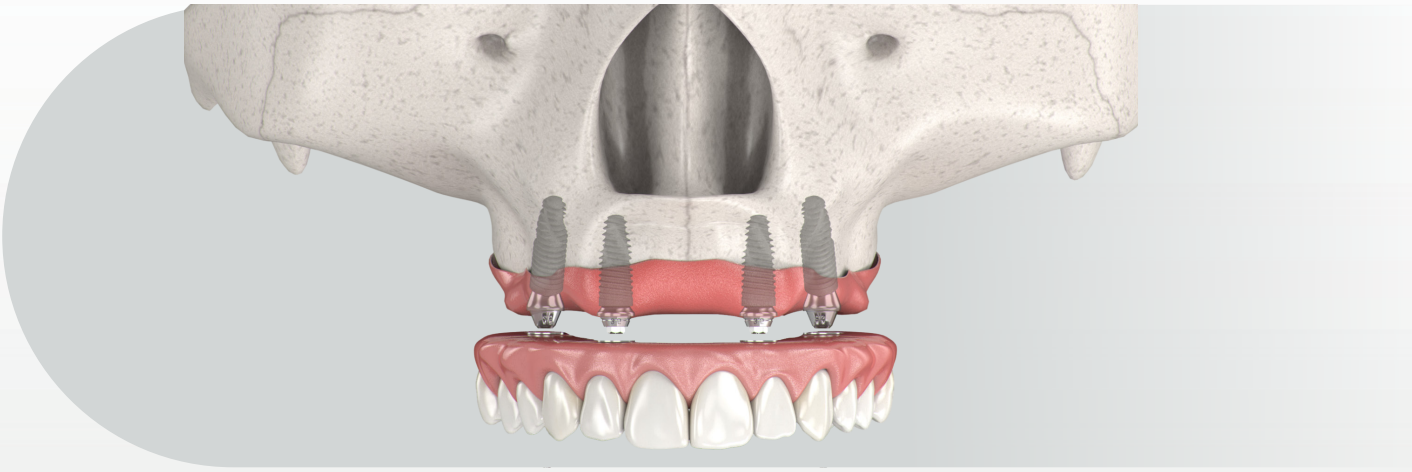
1 4 TO 8 REGULAR IMPLANTS

Helix GM®

DESIGN TO ACHIEVE IMMEDIACY

Ideally, a full arch procedure should optimize an immediate loading with a minimum torque implant placement[14, 16, 17, 18, 19], and a final prosthesis with proper occlusion. Helix GM® implants have a dual tapered outer shape with compressive threads in the coronal area and cutting threads at the apex designed to achieve high stability even in areas of poor bone density.

Additionally, implant selection based on the principle of bicorticalization can achieve a higher torque[20,21], and therefore, more options of lengths and diameters are available for surgeons using this technique.

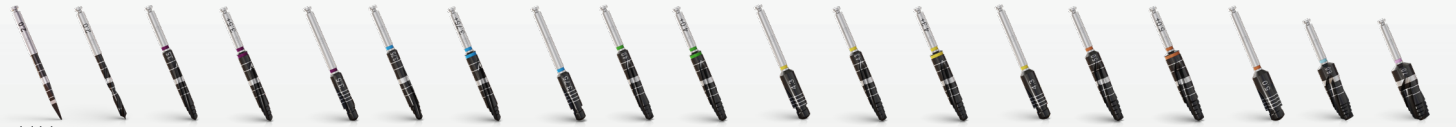


Implant positioning on a full-arch rehabilitation with 4 regular implants.

- *GM prosthetic connection;*
- *Diameters from Ø3.5 to Ø7.0;*
- *Lengths from 8.0 to 18.0 mm*
- *Dynamic progressive thread design: designed to achieve high primary stability in all bone types.*
- *Neoporos and Acqua surface.*

		8.0mm	10.0mm	11.5mm	13.0mm	16.0mm	18.0mm
Ø 3.5	Acqua	140.943	140.944	140.945	140.946	140.947	140.988
	NeoPoros	109.943	109.944	109.945	109.946	109.947	109.988
Ø 3.75	Acqua	140.976	140.977	140.978	140.979	140.980	140.981
	NeoPoros	109.976	109.977	109.978	109.979	109.980	109.981
Ø 4.0	Acqua	140.982	140.983	140.984	140.985	140.986	140.987
	NeoPoros	109.982	109.983	109.984	109.985	109.986	109.987
Ø 4.3	Acqua	140.948	140.949	140.950	140.951	140.952	140.989
	NeoPoros	109.948	109.949	109.950	109.951	109.952	109.989
Ø 5.0	Acqua	140.953	140.954	140.955	140.956	140.957	140.990
	NeoPoros	109.953	109.954	109.955	109.956	109.957	109.990
Ø 6.0	Acqua	140.1009	140.1010	140.1011	140.1012		
	NeoPoros	109.1009	109.1010	109.1011	109.1012		
Ø 7.0	Acqua	140.1059	140.1060	140.1061	140.1062		
	NeoPoros	109.1059	109.1060	109.1061	109.1062		

Table 2. Helix GM® implant lengths and diameters.



	Initial 103.170	Ø 2.0 103.425	Ø 3.5 103.561	Ø 3.5+ 103.578	Ø 2.8/3.5 103.513	Ø 3.75 103.564	Ø 3.75+ 103.579	Ø 3.0/3.75 103.514	Ø 4.0 103.567	Ø 4.0+ 103.580	Ø 3.3/4.0 103.515	Ø 4.3 103.570	Ø 4.3+ 103.581	Ø 3.6/4.3 103.516	Ø 5.0 103.573	Ø 5.0+ 103.582	Ø 4.3/5.0 103.517	Ø 6.0 103.576	Ø 7.0 103.577
Ø 3.5	Optional	✓		✓	✓														
Ø 3.75	Optional	✓	✓				✓	✓											
Ø 4.0	Optional	✓	✓			✓				✓	✓								
Ø 4.3	Optional	✓	✓			✓			✓				✓	✓					
Ø 5.0	Optional	✓	✓			✓			Optional			✓				✓	✓		

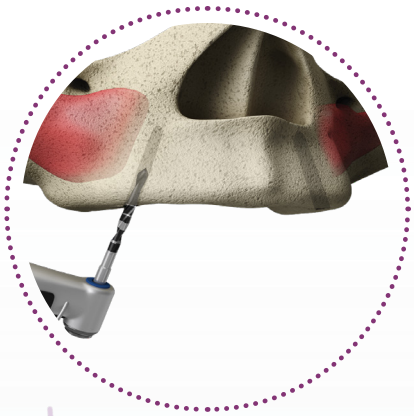
Bone types I and II

Ø 3.5	Optional	✓	✓																
Ø 3.75	Optional	✓	✓			Optional													
Ø 4.0	Optional	✓	✓						Optional										
Ø 4.3	Optional	✓	✓			✓						Optional							
Ø 5.0	Optional	✓	✓									✓			Optional				
Ø 6.0	Optional	✓	✓			✓						✓			✓			✓	
Ø 7.0	Optional	✓	✓									✓			✓			✓	Optional

Bone types III and IV

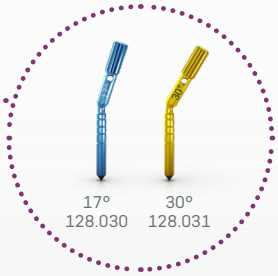
Table 3. Helix GM® drill sequence.

Once the prosthetic and surgical planning are both completed, a flap technique can be used after osteotomy, if necessary for implant placement. According to bone availability, the surgeon can use the quantity of implants that proper will fit for the rehabilitation stress distribution. The following steps are indicated for 4 implants placement:

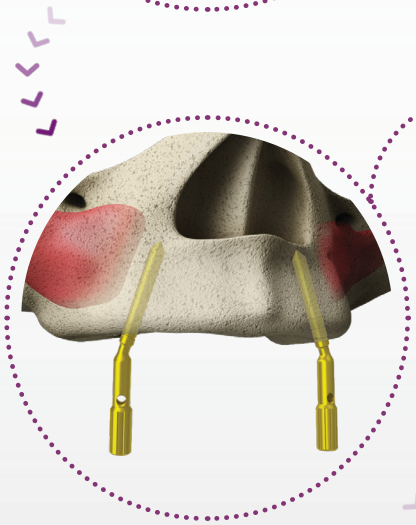


Maxilla instrumentation

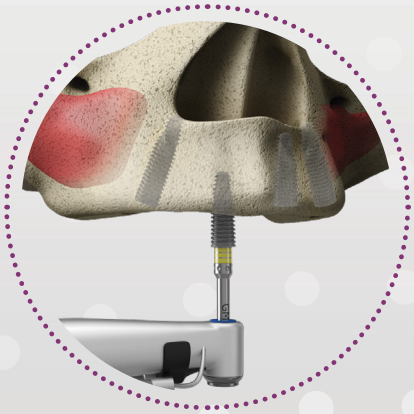
1. Locate important anatomical structures such as maxillary sinus and nasal cavity to place properly tilted implants. Distal implants are placed in the 2nd premolar or 1st molar region and anterior implants in the lateral incisors region. Implant site is prepared by drilling to the appropriate depth and diameter according to previous planning and the instructions for use (www.ifu.neodent.com.br).



GM Angle Measurers for Drill 2.0



2. After 2.0 drilling, position the GM Angle Measurer for Drill 17° or 30° to analyze if tilted preparation is in accordance with the patient residual ridge arch line and the future prosthetic alignment.

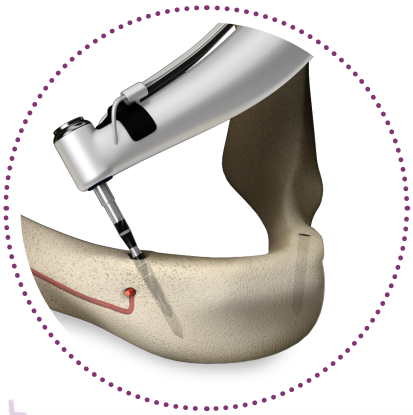


3. Place distal tilted implants first, and then the straight anterior implants in the prepared bone site beginning with handpiece at a rotational speed of 30 rpm and a torque of 32 N.cm. The handpiece driver has metal tweezers in the active apex to keep the implant stable during transport. Finalize implant placement with the torque wrench connection by positioning the implant with the Exact dimple facing to the mesial site and acccording to the patient residual ridge arch line for tilted implants, and buccal site for straight anterior implants placement, providing prosthetic orientation.

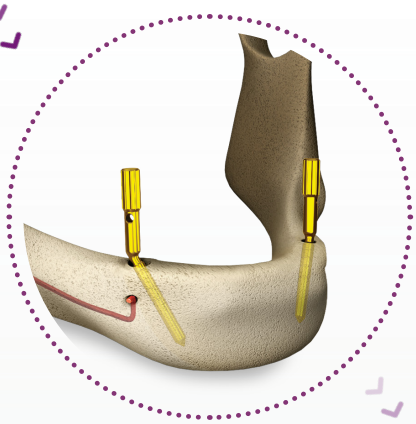
Note: the line markings on torque wrench connections are designed to set the bone level implant positioning. To install anterior implants, prepare anterior sites as far apart from each other as possible and with a safety distance from tilted posterior implants.

Mandible instrumentation

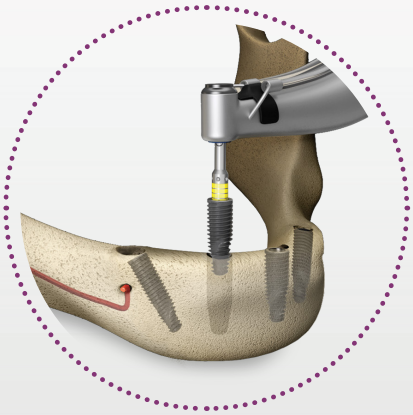
1. Locate important anatomical structures such as the inferior alveolar nerve and place tilted implant avoiding such structures. Distal implants should be positioned in the 1st premolar region and anterior implants in the lateral incisors region.



2. Implant site is prepared by drilling to the appropriate depth and diameter according to previous planning and the instructions for use (www.ifu.neodent.com.br). After 2.0 drilling, position the GM Angle Measurer for Drill 17° or 30° to analyze if tilted preparation is in accordance to the patient residual ridge arch line and the future prosthetic alignment. Continue the drilling sequence until reach the proper alveolar site diameter.

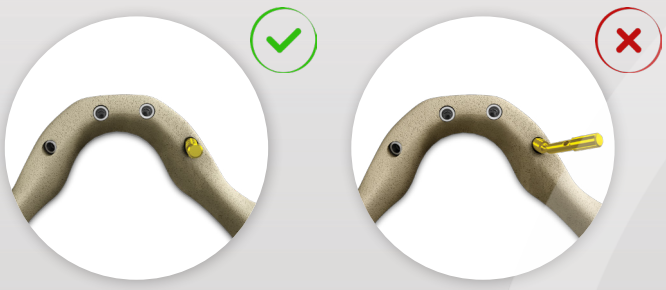


3. Place distal tilted implants first, and then the straight anterior implants in the prepared bone site beginning with handpiece speed of 30 rpm and a torque of 32 N.cm. The handpiece driver has metal tweezers in the active apex to keep the implant stable during transport. Finalize installation with the torque wrench connection by positioning the implant with the Exact dimple facing to the mesial site and acccording to the patient residual ridge arch line for tilted implants, and buccal site for straight anterior implants placement, to provide prosthetic orientation.



Note: the line markings on torque wrench connections are designed to set the bone level implant positioning. To place anterior implants, prepare anterior sites as far apart from each other as possible and with a safety distance from tilted posterior implants.

GM Angle Measurers



After implant placement make sure that the angle measurer is aligned with the patient residual ridge arch line.

BONE PROFILE USE - HELIX GM®

Bone Profile Drill is used to remove bone, if necessary, around the implant platform in the following situations:

- Tilted implants for abutment emergence profile;
- Subcrestal implants positioning;
- Uneven residual alveolar ridge.

The following sequence is indicated:

1. Install the Bone Profile Drill Guide into the implant with the Manual Neo Screwdriver.
2. Fit the Bone Profile Drill into the handpiece and place it over the Guide.
3. Drill into the coronal bone around the implant in cases where the bone interferes with the abutment's emergence profile. Use an intermittent drilling technique with abundant irrigation.

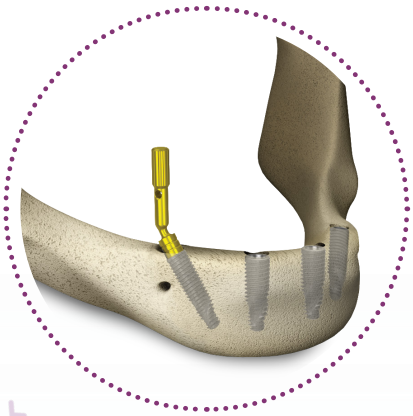
Drilling sequence when using Bone Profile.

Note: When drilling, keep the bone profile and the guide aligned. Do not apply bending forces and be aware that abundant irrigation is necessary.

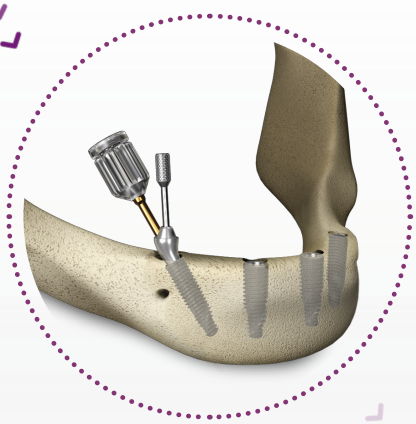
ABUTMENT SELECTION - HELIX GM®

After the implants placement, the following steps for abutment installation are indicated:

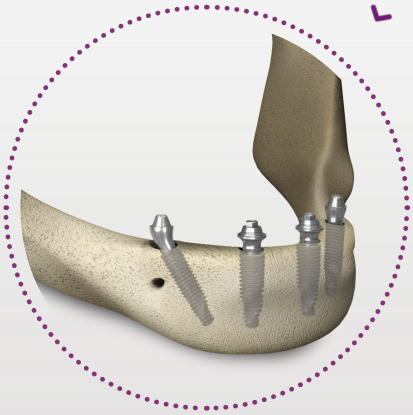
1. For tilted posterior implants, the use of angled abutments is recommended. For abutment selection use the GM Angle Measurer intraorally to determine the final angulation and positioning of Abutment and gingiva height. If the angle measurer is not pointing to the patient residual ridge arch line, the implant still can be rotated for a proper prosthetic future alignment.



2. Install the angled GM Exact Mini Conical Abutment 17°/30° with Neo Screwdriver at a torque of 20 N.cm.



3. There are two options for anterior straight abutments: Micro or Mini Conical Abutment. The difference is that the Micro Conical abutment is recommended for patients that present reduced interocclusal space, providing wider space for a bar construction and/or prosthetic material. For both abutments, use the hexagonal driver with a torque of 32 N.cm. Install the final abutments.



Note: Angled abutments are delivered pre-assembled, which simplifies abutment placement in the posterior region. Furthermore, the pre-assembled driver indicates the orientation of the occlusal screw channel. Additionally, angled abutments are presented in 17° or 30° degrees and 1.5, 2.5, or 3.5 mm gingiva height.

ABUTMENT SELECTION - HELIX GM®

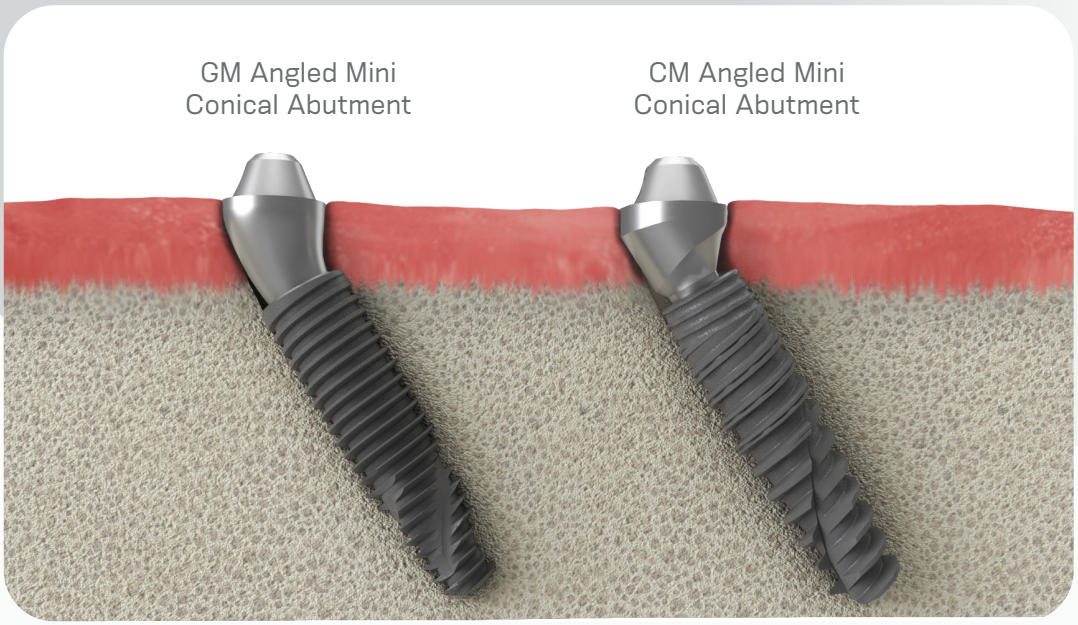


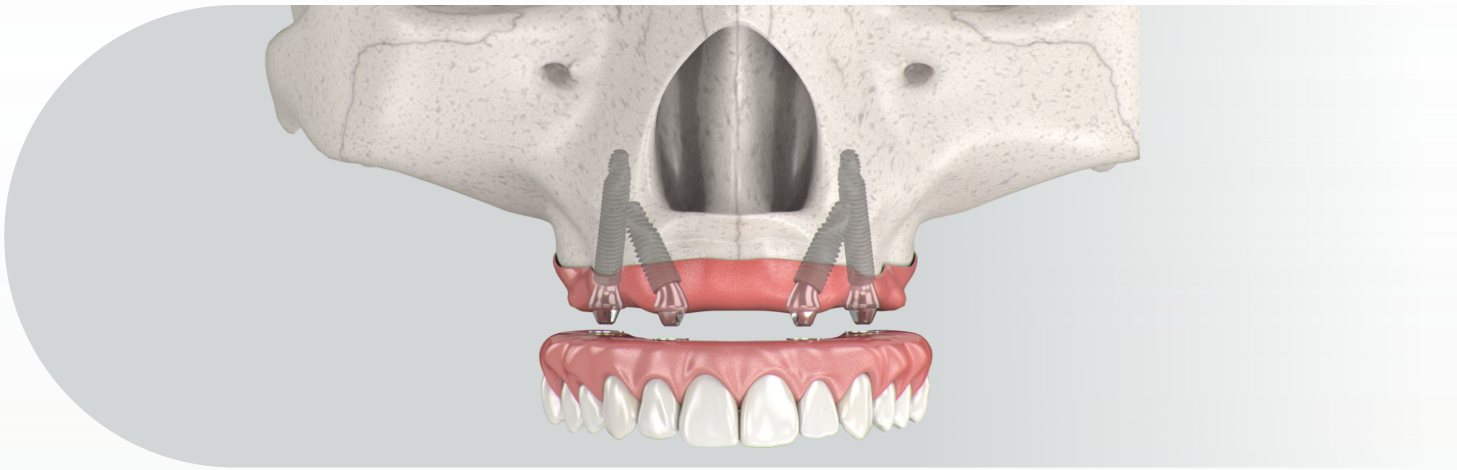
Figure above shows the optimized emergence profile that the new GM Mini Conical Abutment can produce, since is anatomically curved shape. This feature is also designed to facilitate patient daily cleaning procedures.

2 LONG IMPLANTS

The Neodent® Long implants are intended to be surgically placed in the maxilla bone providing support for prosthetic rehabilitations, restoring patient chewing function. They may be used with single-stage or two-stage procedures, for multiple unit restorations, and may be loaded immediately when proper primary stability is achieved and with appropriate occlusal loading. They are indicated for rehabilitation of patients with atrophic maxilla.

Helix GM® Long

SOLUTION FOR BICORTICALIZATION



Implant positioning on a full-arch rehabilitation with 2 long implants and 2 regular implants.

- *GM prosthetic connection;*
- *Diameters of 3.75 and 4.0 mm;*
- *Lengths of 20.0; 22.5 and 25 mm;*
- *Interface aligned to the implant longitudinal axis;*
- *Neoporos surface.*

	20.0 mm	22.5 mm	25.0 mm
Ø 3.75	109.1043	109.1044	109.1045
Ø 4.0	109.1046	109.1047	109.1048

Table 4. Helix GM® Long implant lengths and diameters.

SURGICAL PROCEDURES AND IMPLANT PLACEMENT - HELIX GM® LONG

The technical approach for long implants placement is similar to regular sizes implants. The awareness of anatomical structures and corticalization of such implants, on lateral bone tables of nasal cavity, maxillary sinus, or pterygomaxillary plates region turn to be extremely important, once the extension of such implants is higher. Additionally, the use of longer drills and instruments is required.

The drills of Helix GM® Long are used surgically in the perforation of bone tissue during bed preparation in cases of atrophic maxilla. The set for implant placement is formed by seven drills. Among them, there are three for guided surgical procedure and four for the conventional procedure.

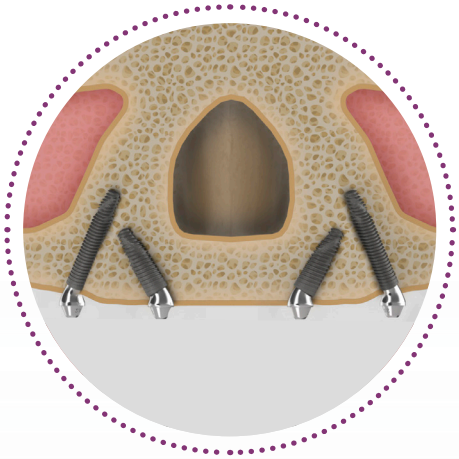
	Initial	Ø 2.35*	Ø 3.75*	Ø 4.0*
	103.453	103.462	103.463	103.464
Ø 3.75 mm	Optional	✓	✓	
Ø 4.0 mm	Optional	✓	✓	✓

For bone types III and IV

* Drills available for both conventional and Guided Surgery procedures.

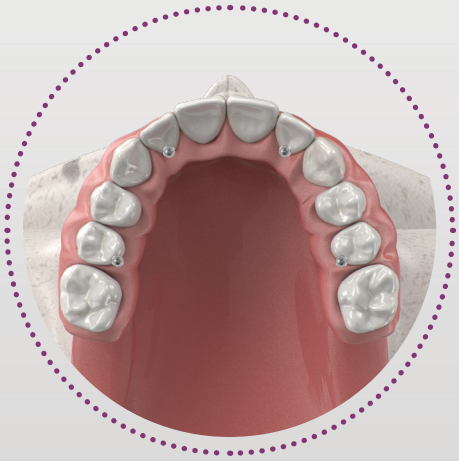
Table 5. Helix GM® Long drill sequence.

M Technique



Four implants are used, two posteriors and two anteriors. The two posteriors are installed in the pre-molar position, in a direction that is inclined up to 45° in a mesial direction tangent to the anterior wall of the maxillary sinus, with the prosthetic platform appearing at the position of the 2nd premolar or 1st molar. The two anteriors implants are tilted posteriorly to also cover the lateral border of the pyriform[9, 22].

M Point is the maximum bone mass at the lateral pyriform rim above the nasal fossa, where the implant apices can engage cortical bone for primary stability[9, 22]. Usually an area that does not suffer with the maxilla bone resorption on the long run.



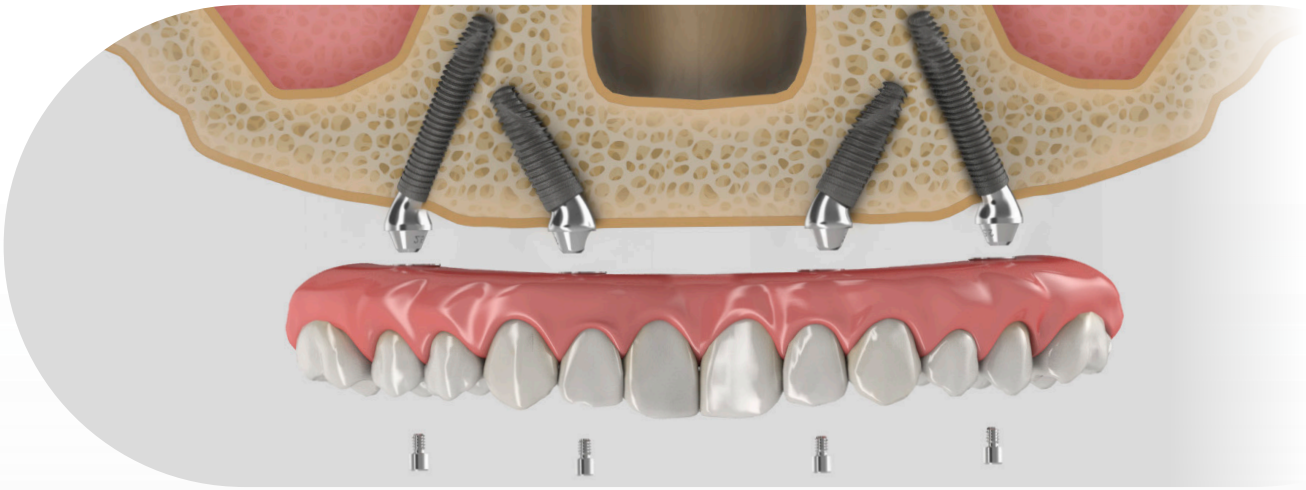
According to Jensen et al. (2014) the most favorable implant angulation, surgically and prosthetically, is 30 degrees, based on the following 3 points:

1. Length of the implant in bone increasing by 50%;
2. It increases occlusal load resistance form;
3. Leading to sub-osseous conformation is splinted configurations, increasing the resistance to shear force.

For extreme angled positions the 45º GM Mini Conical Abutment can be used. The use of angle measures helps to select the proper abutment angle according to the alveolar ridge conformity.

ABUTMENT SELECTION - HELIX GM® LONG

After the Helix GM® Long implants placement, prosecuting abutment selection, provisional temporary prosthetic rehabilitation, and the final restoration confection, present similar steps for regular size implants technique.



According to the implant placement position and the residual alveolar ridge arch, the straight or angled abutments are selected.

GM Exact Mini Conical Abutment

	17°	30°	45°*
1.5 mm	115.275	115.278	115.281
2.5 mm	115.276	115.279	115.282
3.5 mm	115.277	115.280	

*The 45º Mini Conical Abutment is indicated for use only with Helix GM® Long and Zygoma GM™.
Table 6. GM Angled Mini Conical Abutment.

GM Angle Measurer

17°	30°	45°
128.032	128.033	128.034

Table 7. GM Angle Measurers.

3 ZYGOMATIC IMPLANTS

In a clinical scenario of severe maxillary osteomalacia, atrophy, surgical resection, or trauma, conventional implant placement may require different approaches. The resorption of the maxilla in a posterior/superior direction results in a smaller osseous base that necessitates a larger volumetric replacement of the dentoalveolar complex, added to the fact that the complications of sinus disease and enlarged pneumatized sinuses may create the need for multiple grafting procedures to develop suitable osseous tissue and may not present the most desirable pathway for patients.

The use of zygomatic implants avoid the need of bone block grafts, reducing healing period and consequently clinical time for final fixed restoration. The installation protocol , for the Zygoma GM, implies in the placement of two zygomatic implants and additional regular or long implants in the anterior maxilla splinted together, to support a screw-retained fixed dental prosthesis.

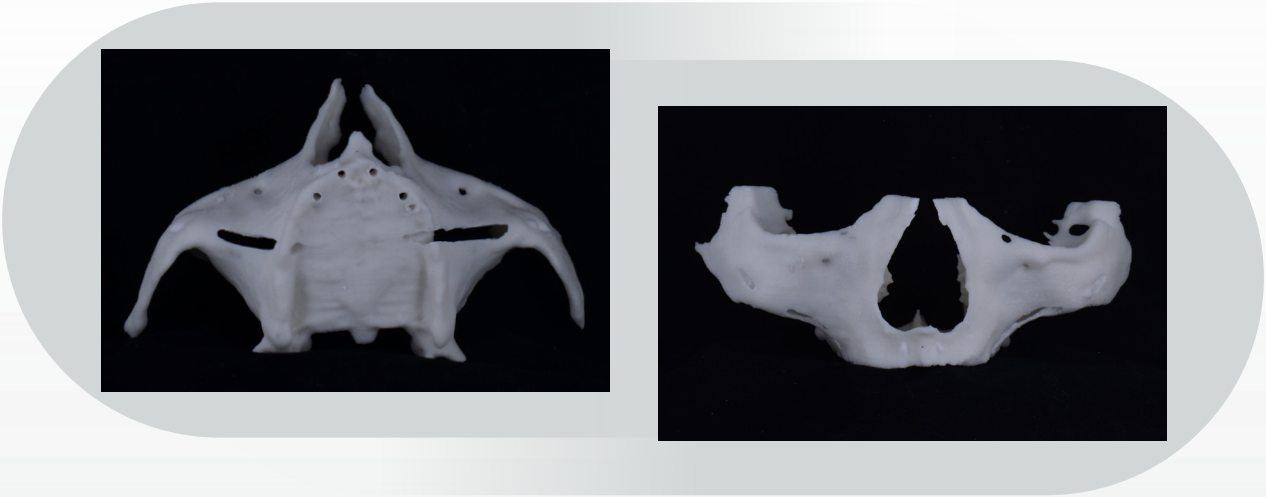
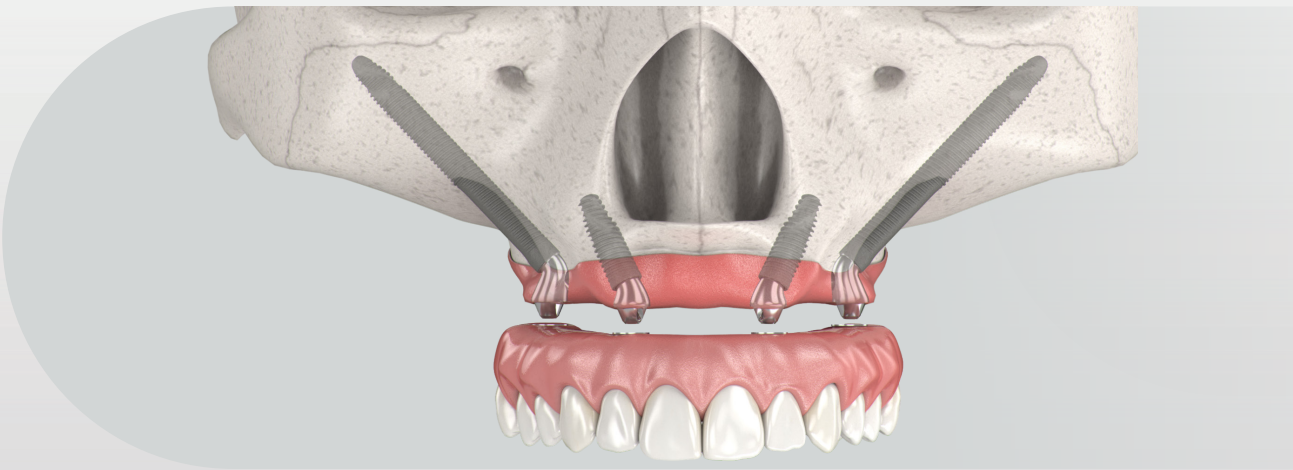


Illustration of anatomical structures.



Implant positioning on a full-arch rehabilitation with 2 Zygoma GM™ implants and 2 regular implants.

ZYGOMATIC IMPLANTS

For the Zygoma-S implants, the installation protocol could be with placement of two zygomatic implants and additional regular or long implants in the anterior maxilla splinted together, or with the placement of 4 zygomatic implants, without the use of regular implants, to support a screw-retained fixed dental prosthesis.

Implant positioning on a full-arch rehabilitation with 2 GM Zygoma-S implants and 2 regular implants.

Implant positioning on a full-arch rehabilitation with 4 GM Zygoma-S implants.

Zygoma GM™

IMPLANT FOR ZYGOMATIC ANCHORAGE

Indicated for surgical placement in the zygoma region, in cases of severe bone jaw resorption, in order to restore patient esthetics and chewing function. Zygomatic Implants are recommended for the posterior maxilla region. Neodent® Zygoma GM™ Implants may be loaded immediately when good primary stability is achieved and with appropriate occlusal loading.

- *GM prosthetic connection;*
- *Diameter of 4.0 mm;*
- *Lengths from 30.0 to 55.0 mm;*
- *Tissue protect portion without threads near to the cervical region, for a friendly contact with the mucosa;*
- *Special Lateral direction drill designed to avoid soft tissue damaging;*
- *Neoporos Surface;*

	30.0 mm	35.0 mm	37.5 mm	40.0 mm	42.5 mm	45.0 mm	47.5 mm	50.0 mm	52.5 mm	55.0mm
Ø 4.0 mm	109.1049	109.1050	109.1051	109.1052	109.1053	109.1054	109.1055	109.1056	109.1057	109.1058

Table 8. Zygoma GM™ implant lengths.

There are specific techniques used in order to promote zygomatic implants installations on the atrophic maxilla. From conventional through the full exterior implant position, or even Stella Sinus Slot technique[23], the surgical approach is considered advanced and requires a specific dental training program.

Due to the long drilling distance to the zygomatic bone and in order to protect critical adjacent anatomical structures, placement of zygomatic implants requires considerable surgical training and experience diagnostic planning. To receive an adequate overview over the anatomical structures, presurgical 3D planning with Cone Bean Computer Tomography scans and a biomodel is strongly recommended.

The drills have a longer lengths when compared to drills for conventional implants. The set of drills for implants placement is composed of six drills; one for guided surgical procedure, one for the exteriorized technique and the others to complete the procedure.

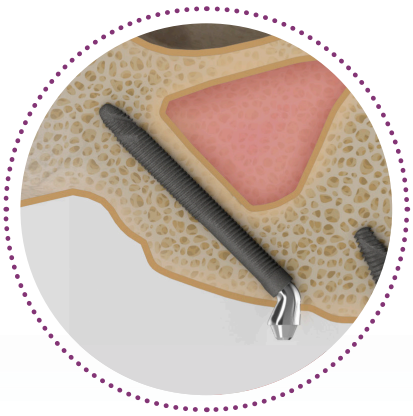
	Ø 2.35*	Lateral directional Ø 4.0	Pilot Ø 2.3/3.2	Ø 3.75	Ø 4.0
	103.455	103.458	103.465	103.456	103.457
Ø 4.0 mm	✓	Optional	Optional	✓	✓

* Drill available for both conventional and Guided Surgery procedures.

Table 9. Zygoma GM™ drill sequence.

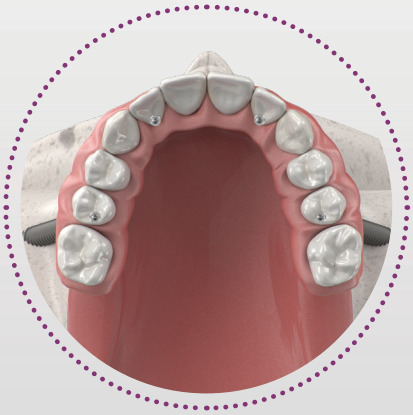
Surgical technique

When performing the technique of implantation in the extra-sinus zygomatic[24], the implant insertion should be guided by the local anatomical conditions, respecting the integrity of the infraorbital nerve, the orbit and the infraorbital fossa. The osteotomy should be performed as posteriorly as possible, maintaining a safe distance of 3 mm from the posterior vertical border of the zygomatic bone. When the trajectory of the zygomatic implant is visualized, surgical drills should be used to create a canal from the residual ridge and continue on the buccal surface of the maxillary body.



Once the sinus membrane is exposed, manual instruments should be used to push it inward in order to preserve its integrity and create space for the drills. Zygomatic implants should be placed in a space created between the membrane and the zygomatic bone, with its body located in the sinus cavity. Neodent® developed The Lateral Direction Drill specially to respect soft tissue, avoiding tissue damage.

The position of the platform regarding the residual ridge should be determined by the surgeon according to prosthetic needs. With this technique, posterior implants usually emerge at the level of the second premolar, while the anterior ones lie on the level of the lateral incisor.



GM Zygoma-S

IMPLANT FOR ZYGOMATIC ANCHORAGE

The Neodent® GM Zygoma-S Implant is indicated for surgical intraoral installation and must be inserted in the posterior maxilla region and in the zygoma. It is indicated for multiple prostheses in cases of severe maxilla re-absorption and total edentulism and could be paced associated with conventional implants or only with zygomatic implants.
The Neodent® GM Zygoma-S Implants may be loaded immediately when good primary stability is achieved with appropriate occlusal loading.

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- *GM prosthetic connection;*
- *Coronal diameter of 4.3 mm;*
- *Body diameters of 3.5 and 3.75 mm;*
- *Lengths from 30.0 to 55.0 mm*
- *Smooth Machined Surface at the implant body, developed to promote a friendly soft tissue interaction to long-term treatment success and preservation [25];*
- *Apex with Neoporos surface, potentializing the osseointegration to enhance the zygomatic anchorage;*
- *A new initial lateral cutting drill: More precision for the initial osteotomy*

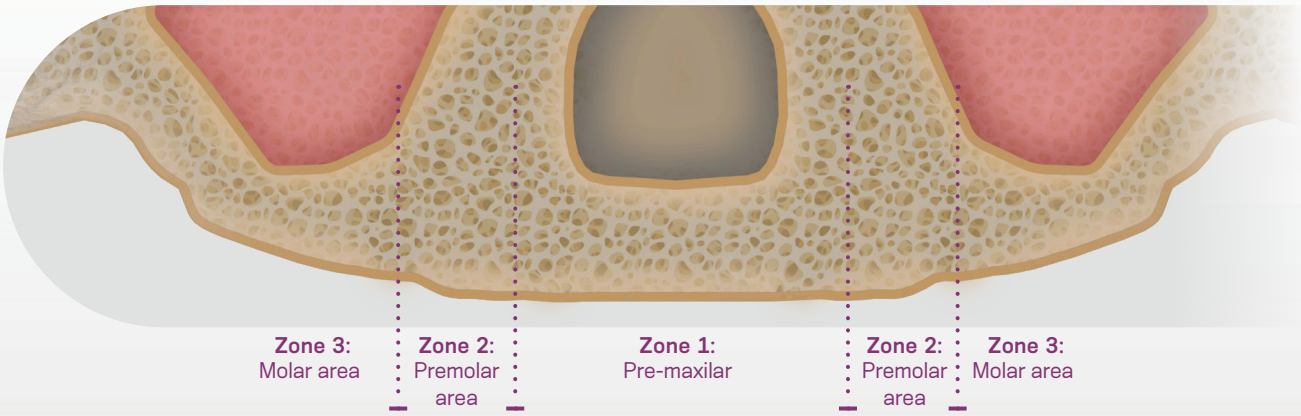
	30.0 mm	35.0 mm	37.5 mm	40.0 mm	42.5 mm	45.0 mm	47.5 mm	50.0 mm	52.5 mm	55.0mm
Ø 3.5 mm	109.1086	109.1087	109.1088	109.1089	109.1090	109.1091	109.1092	109.1093	109.1094	109.1095
Ø 3.75 mm	109.1096	109.1097	109.1098	109.1099	109.1100	109.1101	109.1102	109.1103	109.1104	109.1105

Table 8. Zygoma-S implant lengths.

According to Aparicio et al [26], there are specific techniques used in order to promote zygomatic implants installations on the atrophic maxilla. From conventional through the full exterior implant position, or even Stella Sinus Slot technique[27]. They could be placed together with conventional implants or with the use of multiple zygomatic implants (e.g. two to three in each side) to support a prosthesis as suggested by Bothur et al.[27], the surgical approach is considered advanced and requires a specific dental training program.

Due to the long drilling distance to the zygomatic bone and in order to protect critical adjacent anatomical structures, placement of zygomatic implants requires considerable surgical training and experience diagnostic planning. To receive an adequate overview over the anatomical structures, presurgical 3D planning with Cone Bean Computer Tomography scans and a biomodel is strongly recommended to verify adequate zygomatic dimension and contour to permit placement of the threaded length of the implant entirely in bone. Preoperative medical assessment is also strongly recommended.

According to Bedrossian et al. [28] the maxilla can be divided into three zones: zone 1, the premaxilla; zone 2, the premolar area; and zone 3, the molar area.



The general guidelines for zygomatic implants[29] are as follows:

- Adequate bone in zone 1 for two to four axial implants, and bilateral lack of bone in zones 2 and 3. Typically, two to four routine implants are distributed in the anterior maxilla plus one zygomatic implant on each premolar/molar side.
- Adequate bone in zone 1 and lack of bone in zones 2 and 3 on only one side. One single zygomatic implant is placed, and routine implants are placed on the anterior maxilla and on the side opposite the zygomatic implant.
- Inadequate bone in zone 1 and adequate pristine bone in zones 2 and 3. An anterior zygomatic implant, together with posterior regular implants, can solve the problem.
- Lack of bone in all three zones of the maxilla. Four zygomatic implants can be used for rehabilitation.
- A rescue solution for patients in whom either regular implants and/or the maxillary bone-aumentation procedure have failed.

SURGICAL PROCEDURES AND IMPLANT PLACEMENT - GM ZYGOMA-S

The drills have a longer lengths when compared to drills for conventional implants. The set of drills for Zygoma-S implants placement and the drilling sequence is shown in the image below:

	Initial Drill	Initial lateral cutting drill	Ø 2.35	Lateral cutting drill Ø 4.0	Ø 3.5	Ø 3.75	Pilot drill Ø 4.0
			103.454 □ guided		103.615 ○ 71 mm	103.617 ○ 71 mm	
	103.453	103.613	103.455 ○ 71 mm	103.619	103.616 △ 100 mm	103.618 △ 100 mm	103.620
			103.614 △ 100 mm				
Ø 3.5 mm	Optional	Optional	✓	Optional	✓	----	Optional
Ø 3.75 mm	Optional	Optional	✓	Optional	✓	✓	Optional

Scan the QR or visit the link below and learn more about this unique feature:

neodent.com/zygoma-s_drills

Surgical technique

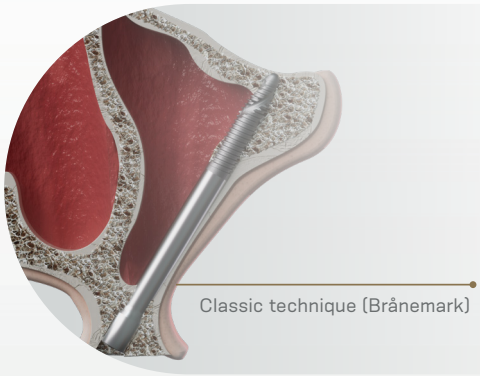
In the original technique, the path of the zygomatic implant was inside the maxillary sinus. The emergence of the head of the implant in the alveolar crest (typically in the palatal aspect of the second premolar region) is dependent on the spatial relationship of the zygomatic bone, the maxillary sinus, and the alveolar crest.[26]

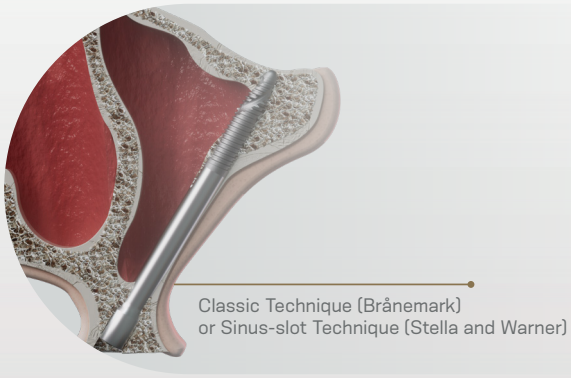
In patients with pronounced buccal concavities on the lateral aspect of the maxillary sinus, the use of the original technique with an intra-sinus path results in excessive palatal emergence of the implant head. This commonly results in a bulky dental bridge at the palatal aspect, which sometimes leads to discomfort and problems with oral hygiene and speech [30 - 33].

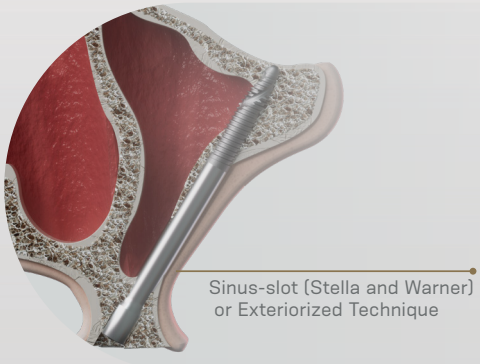
According to Aparicio et al, in order to use an anatomically and more prosthetically driven approach, the original technique has been modified by allowing an extra-sinus path for zygomatic implants. The preparation of the implant site is now guided by the anatomy of the area, and no initial window or slot is opened at the lateral wall of the maxillary sinus. Thus, depending on the relationship between the zygomatic buttress and the intra-oral starting point of the zygomatic implant, the path of the implant body will vary from being totally intra-sinus to being totally extra-sinus (images below). In other words, the new approach mentioned for the placement of the zygomatic implant is neither 'internal' nor 'external' to the sinus wall but, instead, promotes the placement of the zygomatic implant according to the anatomy of the patient. The Neodent® GM Zygoma-S was designed to achieve better results with exteriorized technique.

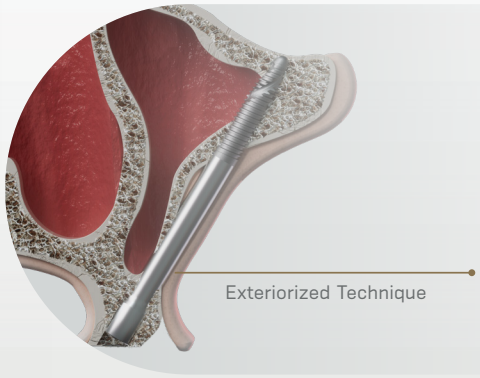
Watch a video of how the smooth surface can optimize clinical results
Scan the QR or visit the link below:

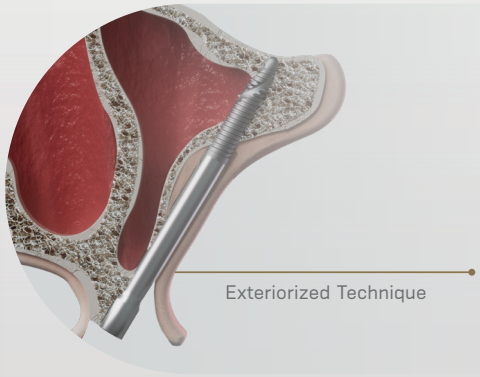
neodent.com/zygoma-s_surface



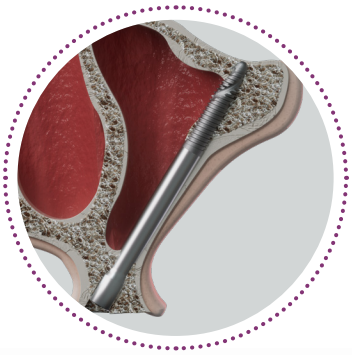






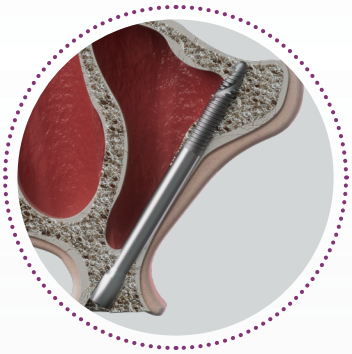


Surgical technique



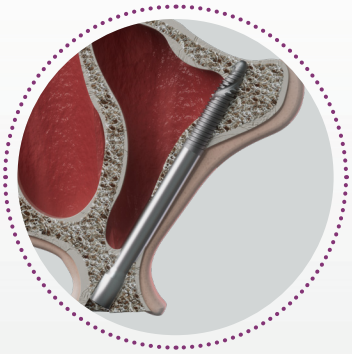
CLASSIC TECHNIQUE (BRÅNEMARK)

The anterior maxillary wall is very flat, with low resorption/ bone loss. The coronal portion of the implant is located on the alveolar crest.The lateral drill is not used. The implant body has an intra-sinus path. The implant has contact with bone at the alveolar crest and zygoma, and sometimes at the internal side of the sinus wall.



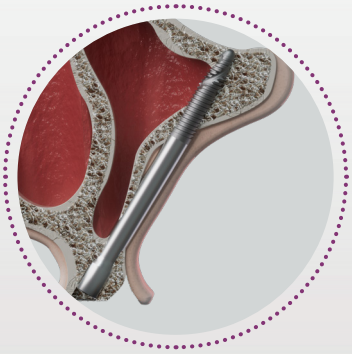
CLASSIC TECHNIQUE (BRÅNEMARK) OR SINUS-SLOT TECHNIQUE (STELLA AND WARNER)

The anterior maxillary wall is slightly concave with an initial bone loss. The coronal portion of the implant is located on the alveolar crest. The drills performed the osteotomy slightly through the wall and the lateral drill is not used. Most of the implant body has an intra-sinus path. The implant has contact with bone at the alveolar crest, lateral sinus wall, and zygoma.



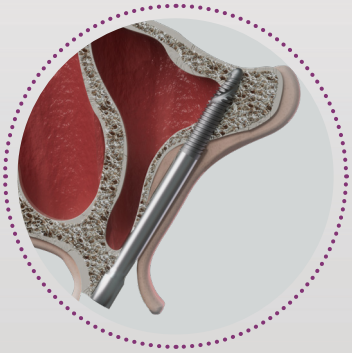
SINUS-SLOT (STELLA AND WARNER) OR EXTERIORIZED TECHNIQUE

The anterior maxillary wall is concave, with medium bone loss. The coronal portion of the implant is located on the alveolar crest. The drill has performed the osteotomy through the wall and most of the implant body has an extra-sinus path. The Lateral drill use is optional. The implant has contact with bone at the alveolar crest, lateral sinus wall and, zygoma.



EXTERIORIZED TECHNIQUE

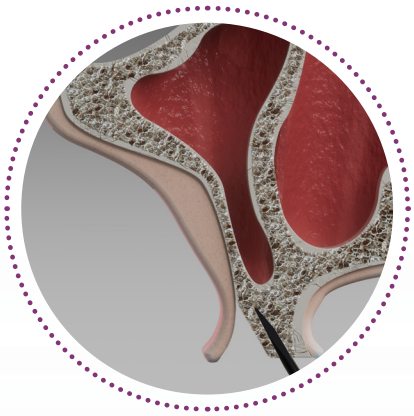
The anterior maxillary wall is very concave, with large bone loss. The coronal portion of the implant is located on the alveolar crest. Most of the body has an extra-sinus path. The lateral drill use is optional. The middle part of the implant body is not touching the most concave part of the wall. The implant has contact with the bone in the coronal alveolar and apical zygoma.



EXTERIORIZED TECHNIQUE (EXTRA-ALVEOLAR)

The maxilla and alveolar bone show extreme vertical and horizontal atrophy. The Coronal portion of the implant is located buccally of the alveolar crest. There is no minimum osteotomy at this level. The drill has arrived at the apical zygomatic entrance following a path outside the sinus wall. The implant contacts bone in the zygoma and part of the lateral sinus wall.

Drilling Sequence – Classic technique



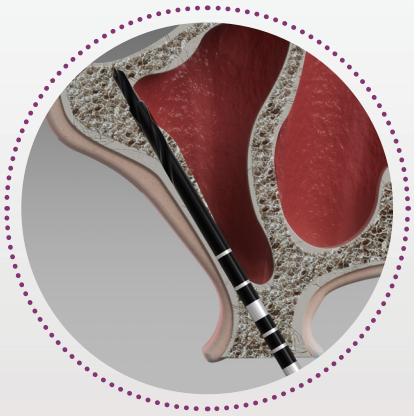
STEP 01 (OPTIONAL) - INITIAL DRILL

The initial drill could be used to start the de bone bed preparation, at the alveolar crest.

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 800 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



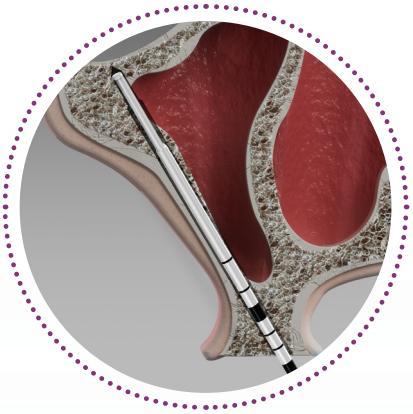
STEP 02 – Ø 2.35 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

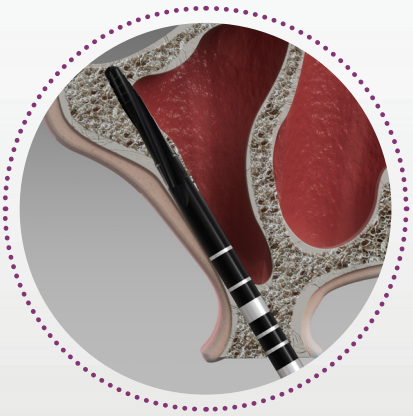
Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.

Drilling Sequence – Classic technique



STEP 03 - DEPTH PROBE 2.35

After the initial drilling at the planned location with the 2.35 drill, insert the metallic rod of the 2.35 Probe for Zygoma-S into the cavity and use the L-shaped end to measure the implant length using the laser markings indicated on the rod.



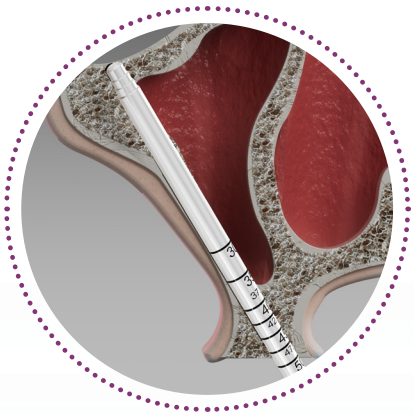
STEP 04 – Ø 3.5 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.

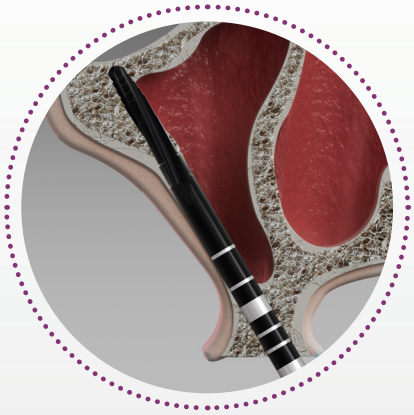
Drilling Sequence – Classic technique



STEP 05 - DEPTH PROBE 3.5

After the drilling at the planned location with the Ø 3.5 drill, insert the metallic rod of the Ø 3.5 Probe for Zygoma-S GM into the cavity. Check the deep of the perforation using the laser markings indicated on the rod.

For Ø 3.5 implant placement move forward direct to the pilot drill.

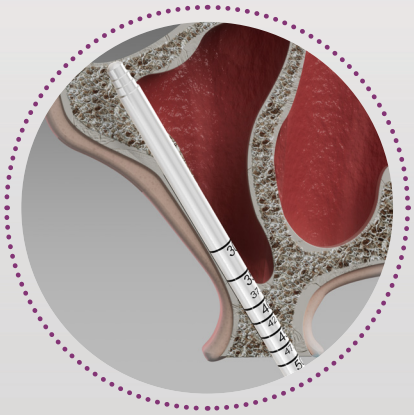


STEP 06 – Ø 3.75 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

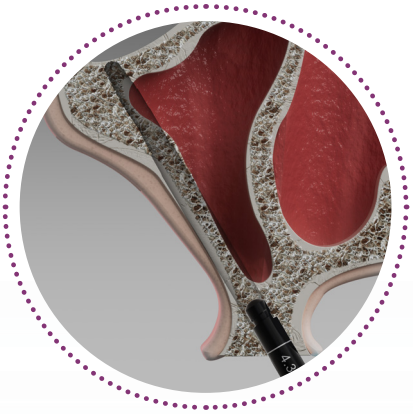
Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 07 - DEPTH PROBE 3.75

After the drilling at the planned location with the Ø 3.75 drill, insert the metallic rod of the Ø 3.75 Probe for Zygoma-S GM into the cavity. Check the deep of the perforation using the laser markings indicated on the rod.

Drilling Sequence – Classic technique



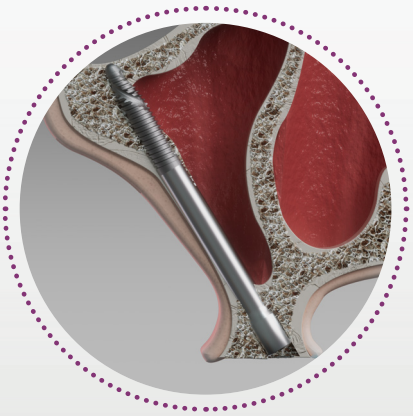
STEP 08 – PILOT DRILL Ø 4.3

Use the Pilot Drill Ø 4.3 for the osteotomy in the alveolar crest for the cervical region of the implant.

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant until the laser mark.

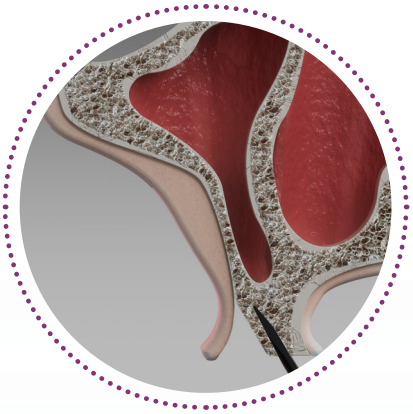
Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 09 - IMPLANT PLACEMENT

Capture the implant with the GM Implant Driver - Contra-angle, maintaining the driver still and gently spinning the internal support. Look for the perfect fit between the driver and the implant.
Transport the implant to the surgical cavity. Use a maximum torque of 35 N.cm and 30 rpm rotation in the surgical motor. Use the torque wrench connected to the GM Implant Driver Torque Wrench to finish the installation of the dental implant. Apply torque until the implant reaches its final position. All torque wrenches show torque levels. A value above 60 N.cm is contraindicated

Drilling Sequence – Exteriorized Technique - Extra-alveolar



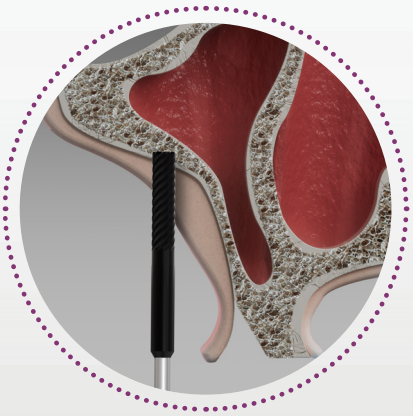
STEP 01 (OPTIONAL) – INITIAL DRILL

The initial drill could be used to start the de bone bed preparation, at the alveolar crest.

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 02 (OPTIONAL) – INITIAL LATERAL CUTTING DRILL

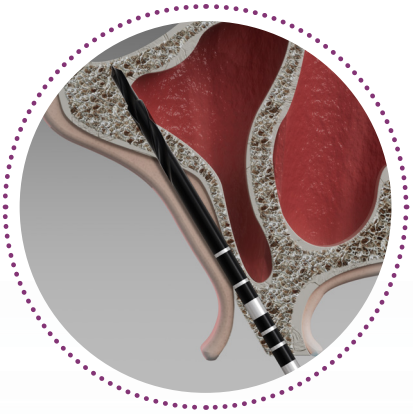
The Initial Lateral Cutting Drill is used for initiating the drilling on the zygomatic bone during surgeries with the extra sinus technique. During osteotomy, the drill reaches the zygomatic bone through the outer part of the sinus wall. They are indicated for facilitating the entry and for preventing slides from the following drill thanks to their inclined plane in relation to the drill axis.

Attach the Drill to the Straight Piece and set the surgical motor to a speed of 20000 **rpm.**

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.

Drilling Sequence – Exteriorized Technique - Extra-alveolar

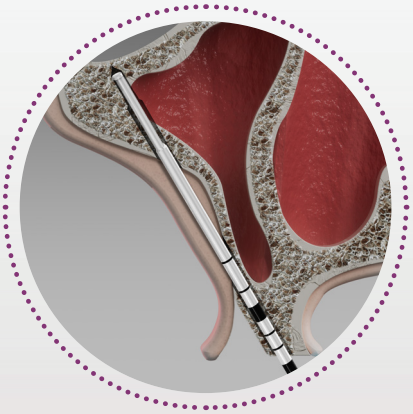


STEP 03 – Ø 2.35 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

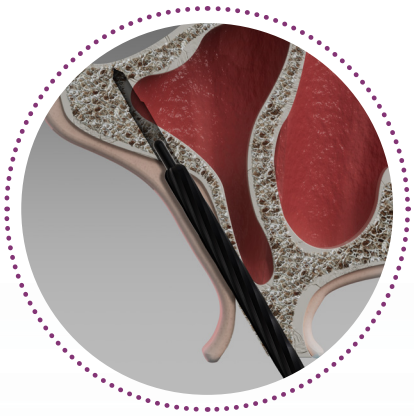
Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 04 - DEPTH PROBE 2.35

After the initial drilling at the planned location with the 2.35 drill, insert the metallic rod of the 2.35 Probe for Zygoma-S into the cavity and use the L-shaped end to measure the implant length using the laser markings indicated on the rod.

Drilling Sequence – Exteriorized Technique - Extra-alveolar

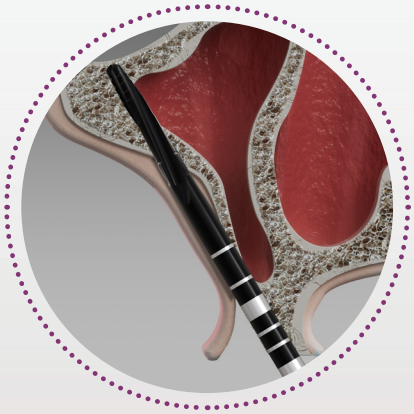


STEP 05 (OPTIONAL)– LATERAL CUTTING DRILL Ø 4.0

Is used to create a cavity in the external sinus wall and/or maxilla to correctly accommodate the medium and/or cervical parts of the implant. Attach the Drill to the Contra-Angle and set the surgical motor to a speed between **600 and 800 rpm.**

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



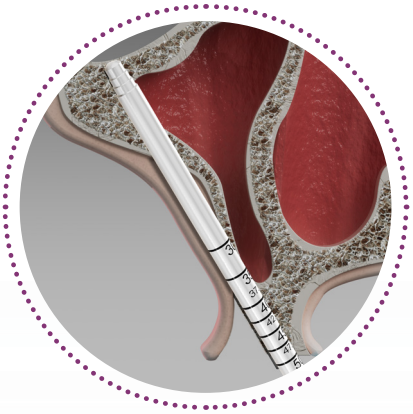
STEP 06 – Ø 3.5 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.

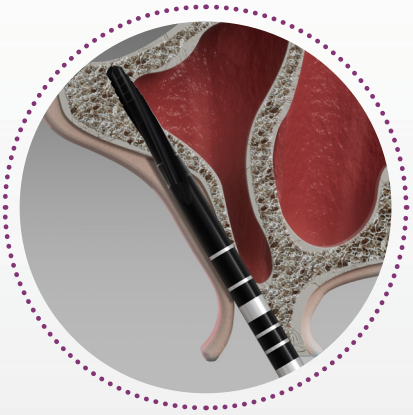
Drilling Sequence – Exteriorized Technique - Extra-alveolar



STEP 07 - DEPTH PROBE 3.5

After the drilling at the planned location with the Ø 3.5 drill, insert the metallic rod of the Ø 3.5 Probe for Zygoma-S GM into the cavity. Check the deep of the perforation using the laser markings indicated on the rod.

For Ø 3.5 implant placement move forward direct to the pilot drill is necessary.



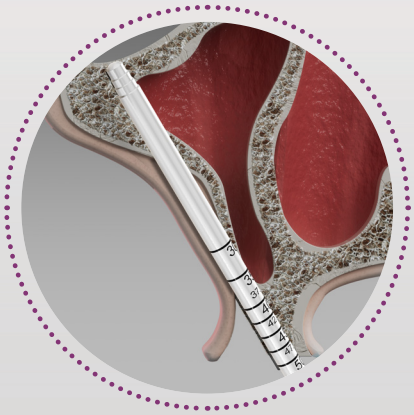
STEP 08 – Ø 3.75 DRILL

Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation.

This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant.

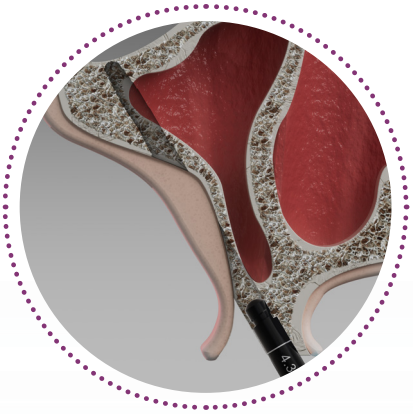
Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 09 - DEPTH PROBE 3.75

After the drilling at the planned location with the Ø 3.75 drill, insert the metallic rod of the Ø 3.75 Probe for Zygoma-S GM into the cavity. Check the deep of the perforation using the laser markings indicated on the rod.

Drilling Sequence – Exteriorized Technique - Extra-alveolar

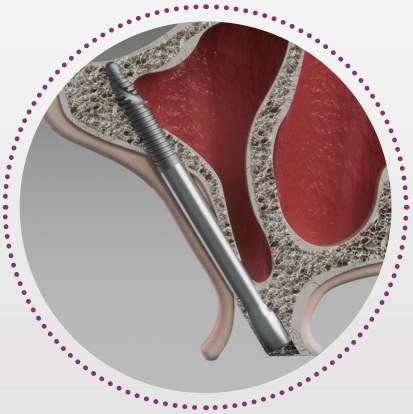


STEP 10 - PILOT DRILL 4.3 (OPTIONAL)

Use the Pilot Drill Ø 4.3 for the osteotomy in the alveolar crest for the cervical region of the implant.
Attach the Drill to the Contra-Angle and set the surgical motor to a speed between 600 and 1200 rpm.

Start the motor and perform bone bed drilling with continuous movements of insertion and removal, under abundant irrigation. This irrigation can be either manual or combined with the irrigation from the motor. During drilling, pressure cannot be excessive. The insertion depth must be in accordance with the planning for the final position of the implant until the laser mark.

Do not interrupt the rotation of the motor while the drill is inside the surgical cavity, as this may impede its removal or cause it to break.



STEP 11 – IMPLANT PLACEMENT

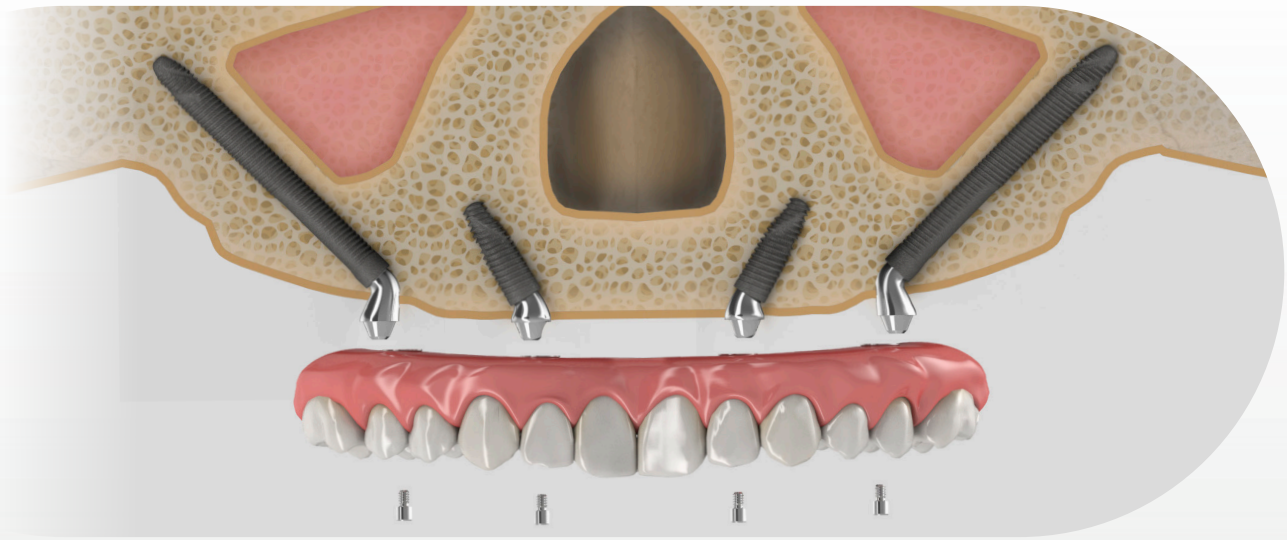
Capture the implant with the GM Implant Driver - Contra-angle, maintaining the driver still and gently spinning the internal support. Look for the perfect fit between the driver and the implant.

Transport the implant to the surgical cavity. Use a maximum torque of 35 N.cm and 30 rpm rotation in the surgical motor. Use the torque wrench connected to the GM Implant Driver Torque Wrench to finish the installation of the dental implant. Apply torque until the implant reaches its final position. All torque wrenches show torque levels. A value above 60 N.cm is contraindicated.

ABUTMENT SELECTION - ZYGOMATIC IMPLANTS

Zygomatic implants placement over the crest ridge allows traditional prosthetic reconstruction, in contrast to the challenge of palatally positioned implants. Thus, the use of angle measures helps to select the proper abutment angle according to the alveolar ridge conformity.

For extreme angled positions, the prosthetic portfolio offers the GM Mini Conical Abutment with 45º, 52º and 60º of inclination. They are available with gingival heights of 1.5 or 2.5 mm.
The GM Mini Conical Abutment with 45º, 52º or 60º has a anti-rotational fitting with GM implant interface while a rotational fitting format for the upper prosthetic interface. They are indicated and developed to receive screw-retained multi-unit prosthesis, in immediate or conventional rehabilitation procedure.



GM Exact Mini Conical Abutment

Scan the QR or visit the link below and learn more about this **unique feature:**

neodent.com/zygoma-s_prosthetic

	17°	30°	45° Slim**	45°*	52°**	60°**
1.5 mm	115.275	115.278	115.302	115.281	115.300	115.285
2.5 mm	115.276	115.279	115.303	115.282	115.301	115.286
3.5 mm	115.277	115.280				

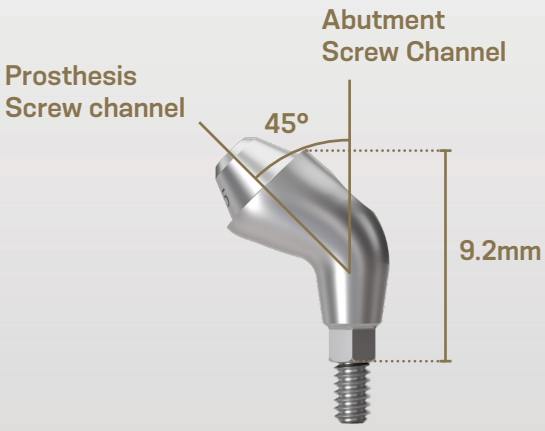
*The 45º Mini Conical Abutment is indicated for use only with Helix GM® Long, Zygoma GM™, and Zygoma-S.

**The 45º Mini Conical Abutment Slim, the 52º Mini Conical Abutment and 60º Mini Conical Abutment are indicated for use only with Zygoma GM™ and Zygoma-S.

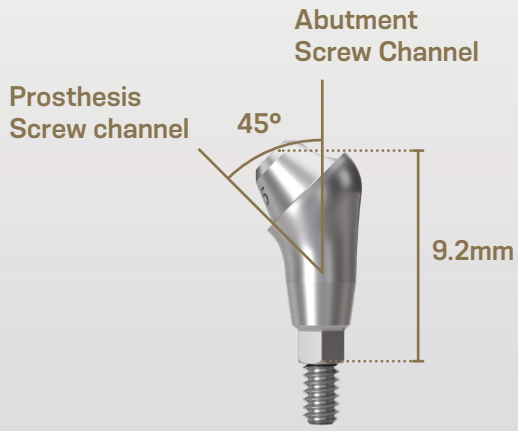
Table 10. GM Angled Mini Conical Abutment.

Diffrences between Mini Conical Abutment 45º and Mini Conical Abutment 45º Slim

45º

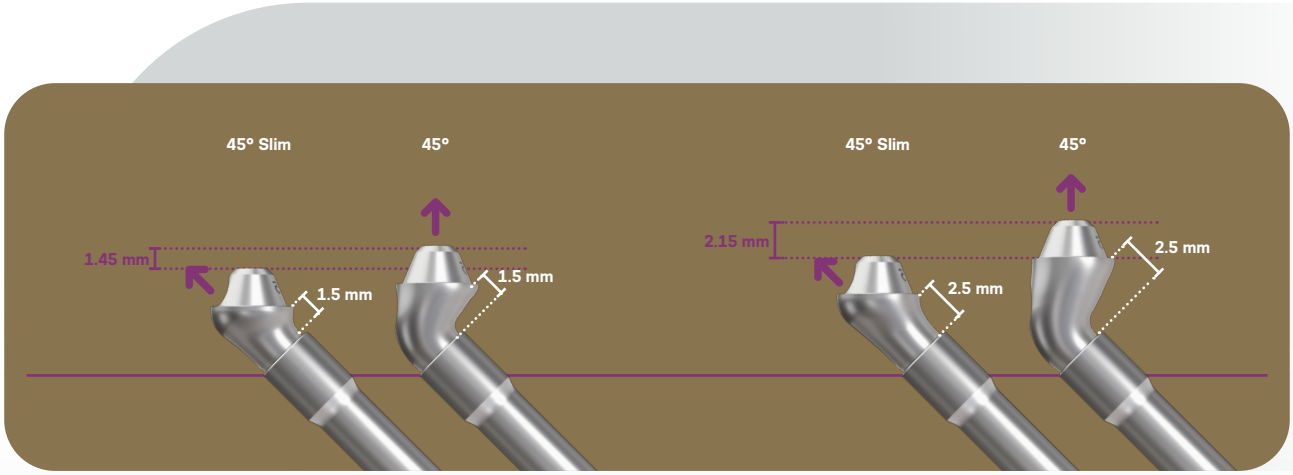


45º Slim



The Abutment and the prosthesis screw channel are both on the prosthetic platform of the abutment, making the access easier in cases of rework and maintenance.

Diffrences between Mini Conical Abutment 45° and Mini Conical Abutment 45° Slim



There is a difference between the final horizontal position of the mini conical prosthetic platform and on the transmucosal final height.

That happens because the Transmucosal Height of the mini conical 45° slim is measured related to the long axis of the implant, while the mini conical 45°transmucosal height is measured related to the occlusal screw, as indicated with the arrow above.

GM Angle Measurer

17° 30° 45° 60°

128.032	128.033	128.034	128.035

Table 11. GM Angle Measurers.

PROVISIONAL RESTORATION

PROTECTION CYLINDER

For use of the Mini Abutment in two-stage procedures, a prior preparation can be done on the soft tissues with the use of a healing abutment. The abutment must be selected according to the planning and placed on the implant according to the recommended torque and connection. The proper fit should be ensured and the compatible Neo Mini Conical Abutment Protection Cylinder can be installed.

Neo Mini Conical Abutment Protection Cylinder.

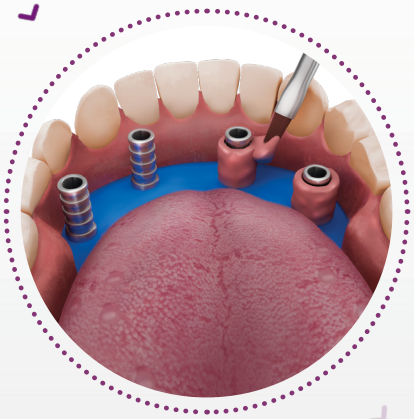
The new Wide Abutment Protection Cylinder is indicated to protect the Mini Conical Abutment (regular platform) during the prosthesis development and prepares the gingiva for the prosthetic workflow. The protective cylinder maintains free space around the mini abutment platform, facilitating the prosthetic working flow.

Neo Wide Abutment Protection Cylinder.

Immediate provisionalization

In the 48 hours after the surgical procedure, clinicians can provisionally restore the patient's oral function and aesthetics. The restorative portfolio contains the Neo Distal Bar to strengthen the provisional transition from complete denture to fixed full-arch. The following steps for an IMMEDIATE TEMPORALIZATION are indicated:

1. Promote lingual wear on the conventional complete denture preserving the buccal and posterior region integrity.



2. Place non-engaging Titanium Copings on the anterior and posterior abutments. Proof the alignment and relation between implant components and prosthesis. Once the position is ensured, make sure the occlusal set up fits with the prepared prosthesis and place a rubber sheet over the copings to protect and avoid acrylic resin contact with soft tissue. Apply pink acrylic resin around the copings. Patient should be in occlusion to stablish a proper central relation between arches until resin polymer.

3. Finalize and polish the temporary restoration. Place the temporary restoration in the patient's mouth and tighten the occlusal screws to 10 N.cm using the Neo Screwdriver.

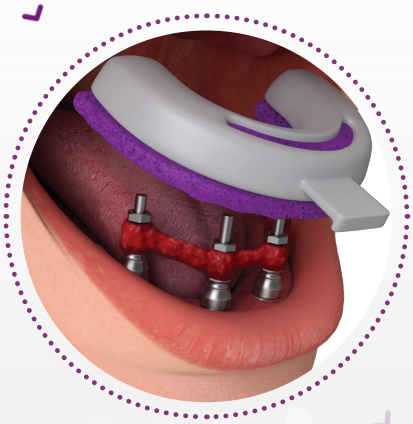
PROSTHETIC OPTIONS AND PROCEDURES

IMPRESSION TAKING ON ABUTMENT LEVEL

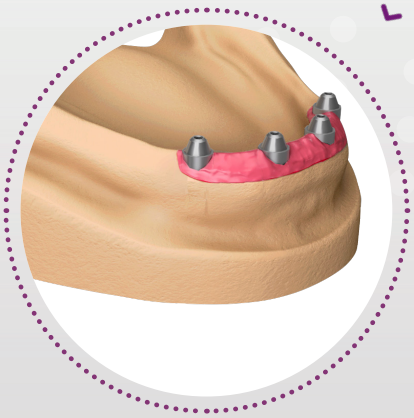
Once the surgical procedures and abutment placement are completed, an impression is taken to cast the final abutment positions in the plaster model. The following steps for an OPEN TRAY IMPRESSION are indicated:

1. Place the Slim Mini Conical Abutment Open Tray Impression Coping accurately into the abutment and only rotate the screw, manually or with the aid of Neo torque Connection. Make perforations in the custommade impression tray (light-cured resin) according to the individual situation and check if the Screw of Impression Coping protrudes visibly.

2. Splint the Impression Copings using a low shrinkage polymerization acrylic resin according to manufacturer recommendation. It is recommended to take the impression using a standard elastomeric impression material (e.g. polyvinyl siloxane). Uncover the screws before the material is set. Once the material is set, loosen the Copings Screws with the Neo Torque Connection and remove the tray. For easy abutment identification, include the analogs when you send the dental impression to your dental lab partner.



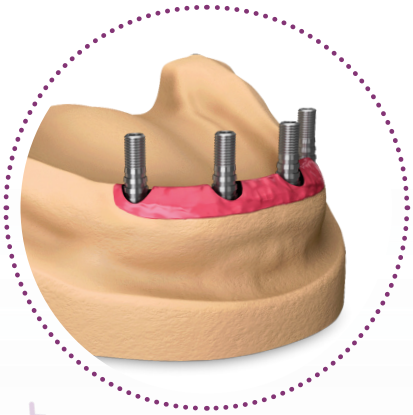
3. Fabricate the master cast with stone type IV or proceed with a digital scanning process creating a 3D printed model. For conventional workflow, a gingival mask should always be used to ensure that the emergence profile is optimally contoured. This final plaster model will be used in the next steps of restoration process.



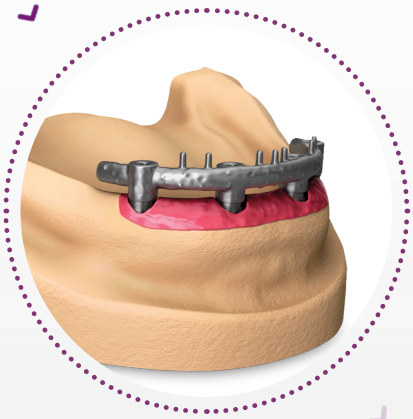
FINAL RESTORATION – CONVENTIONAL

After the final plaster model is produced, the bar can be made at the laboratory center by conventional cast.

1. Place the castable copings (One step hybrid set or conventional copings, for more information about the one step hybrid technique, further in this manual) on the top of the analogs with a 10 N.cm torque. Wax-up the bar-framework according to the availability of patient interocclusal space.



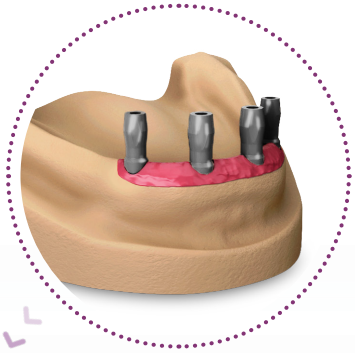
2. Cast the bar and check its alignment over the model. For conventional casting, a clinical section is required to ensure passive fit of the bar. If not, perform a cross-section on the bar and reconnect intraorally with low shrinkage polymerization acrylic resin, reestablishing the bar fit. For One step hybrid technique, cement the structure over titanium copings.



3. Produce the final restoration based on the custom-milled framework. Install final complete fixed restoration on the patient's mouth.

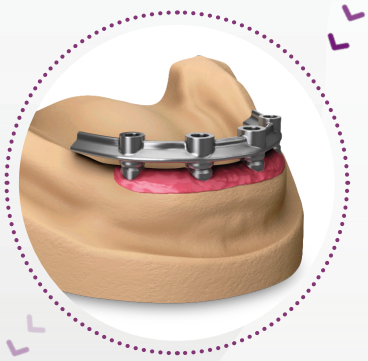
FINAL RESTORATION – DIGITAL

If you decide to work with a custom-milled digital framework, please proceed as follows:



1. Fabricate a master cast based on a dental impression or proceed with digital scanning process to create a 3D printed model. Place the Mini Conical Abutment Scanbodies onto the analogs on the dental model using the 1.2 Manual Screwdriver.

2. Scan the plaster model set with the help of a scanner and design the framework in CAD software.



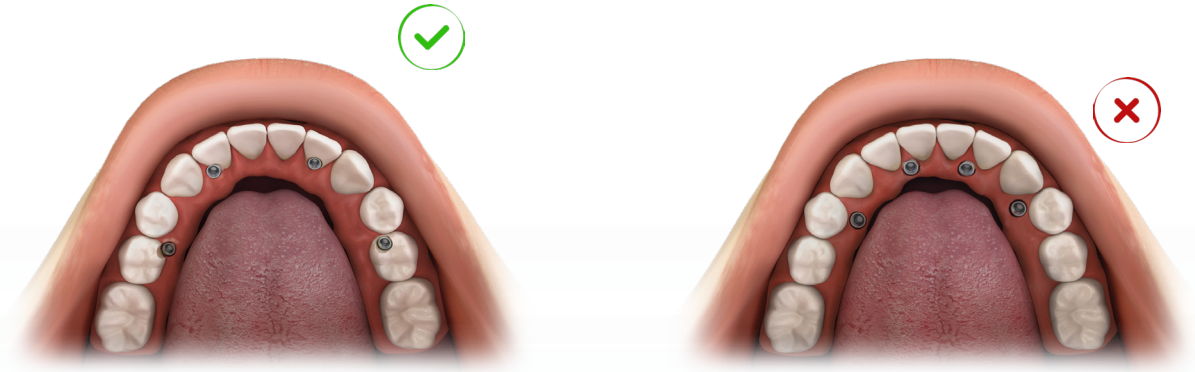
3. Produce the final restoration based on the custom-milled framework.

4. In the dental office, place the final restoration into the patient's mouth.

Visit http://en.neodent.com.br/libraries-cadcam to download the digital Neodent® files. Libraries are available for the following softwares: CARES Visual, Dental Wings and 3Shape.

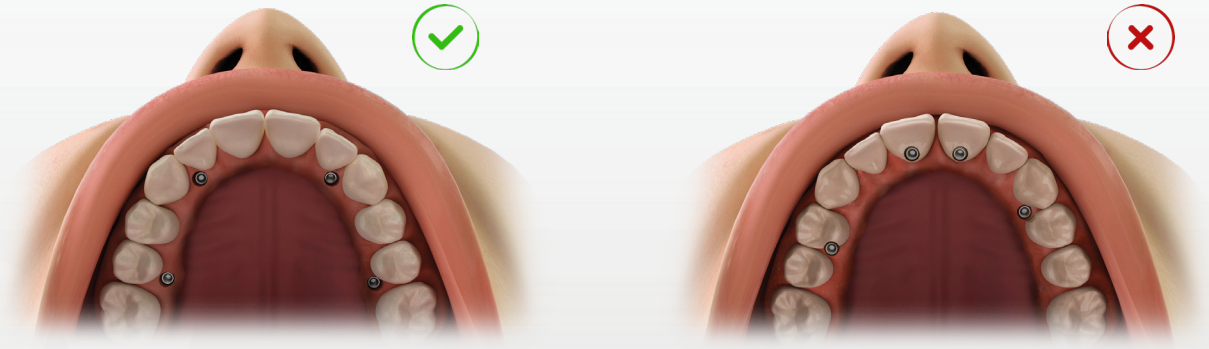
CANTILEVER PLANNING

For mandible rehabilitations, cantilever size is indicated up to 2 teeth (2nd pre molar and 1st molar) and anterior implants are ideally placed in the lateral incisor region[9,10].



Force distribution and resistance proportions on full-arch rehabilitations with four implants.

In maxilla planning, the cantilever should extend only for the 1st molar. Anterior implants can be located at the lateral incisor or canine region[9,10].



Proportion and relation of implants positioning and size of cantilever.

For a better stress distribution, the outlined shape between the implants should be the biggest square format as possible.

ONE STEP HYBRID TECHNIQUE

FINAL RESTORATION USING ONE STEP HYBRID TECHNIQUE

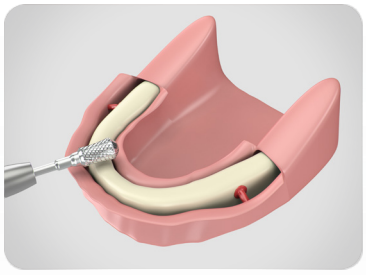
The process follows with the impression technique: fit the corresponding Impression Coping onto the abutment, ensure the proper fit and perform the impression. Once the plaster model is ready, the prosthesis can be produced, using the Cylinders of the Mini Conical Abutment according to appropriate laboratory techniques or the one step hybrid solution, for more information regarding this technique see next page. Tests must be carried out on passivity and the fit of the prosthesis's structure.

For installation of the prosthesis, remove the Protection Cylinder and install it with the indicated torque over the prosthetic abutment. To conclude the process, protect the access of the screw.

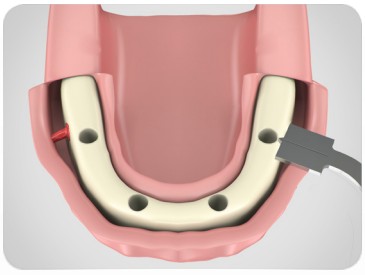
Neo Mini Conical Abutment Titanium Coping and Neo Mini Conical Abutment Coping Base.

ONE STEP HYBRID TECHNIQUE

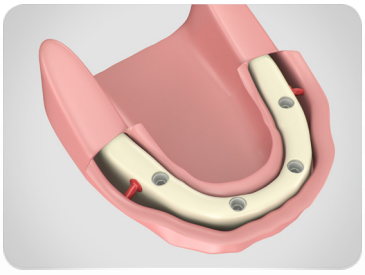
The One Step Hybrid technique allows the passive fitting of prosthesis, without the need for weld procedure, by cementing the neo micro/mini titanium abutment coping base into the metal structure. This technique allows as well through a digital workflow, milled dental structure to be cemented on top of this titanium abutment coping. It is indicated for multi-unit screw-retained prosthesis and results in reduced laboratory work times. It can be performed over GM Mini Conical Abutments or GM Micro Abutments. The sequence to perform the One Step Hybrid technique is described in the following pictures:



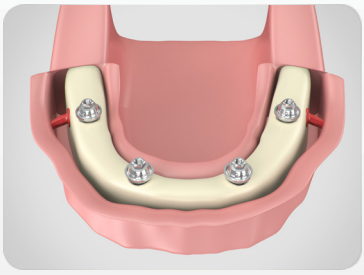
1) Regularize the alveolar ridge.



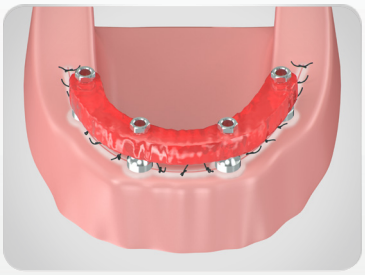
2) Surgical drilling completed, obtaining adequate distance from distal implant in relation to the mental foramen with 7 mm Space Planning Instrument.



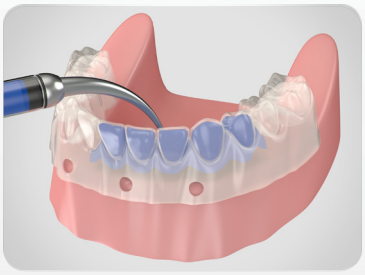
3) Placement of 4 Neodent® implants, according to their indication.



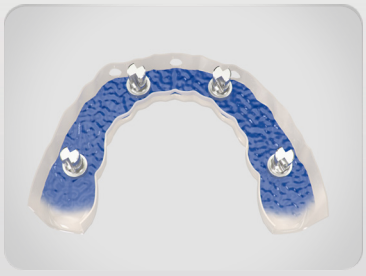
4) Placement of corresponding Neodent® Abutments.



5) Placement of Impression Copings, splinted with acrylic resin.



6) Positioning of Multifunctional Guide to obtain intermaxillary correlation. Soft silicone is injected to take the soft tissue impression.



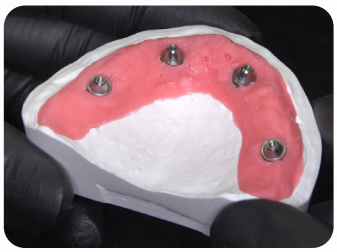
7) Removal of Multi-Funcional Guide and placement of Analogs to the impression copings.

8) Working model with artificial gum.

Option 1 -Conventional Workflow for cast framework

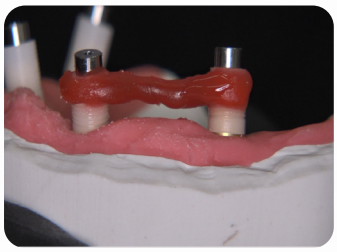
Neo Mini Abutments Copings
One Step Hybrid Technique

Burn-out	Brass	Titanium
118.340	118.331	118.382



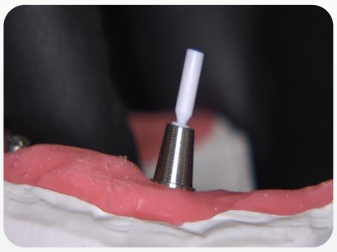
1) Working model with artificial gum.

2) Brass Copings are placed over analogs, then Burn-out Copings are fixed by working screws.

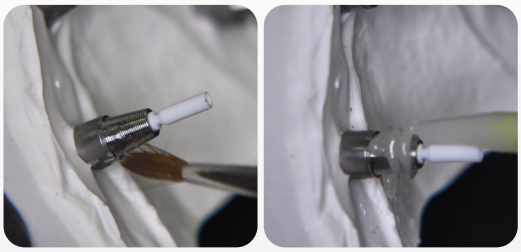


3) Wax-up the framework.

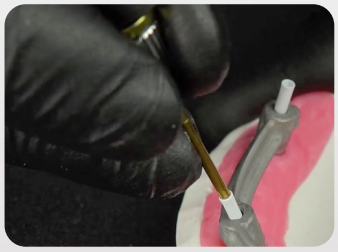
4) Cast framework. If necessary, provide internal wear in the regions corresponding to the castable copings.

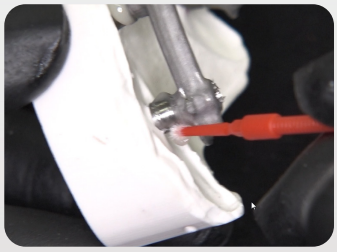


5) Placement of both the Neo Mini Conical Abutment Coping Base and the sealing pin on top of the analog.



6) Apply a specific primer and proceed with the cementation according to the cement manufacturer.





7) Press the infrastructure over the coping base and immediately remove any overflown cement excess as well as the sealing pin.

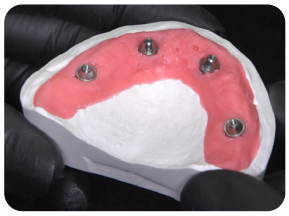
8) Unscrew the infrastructure from the model. Final framework with ensured passivity.

Option 2- Digital Workflow for milled Zirconia Bar

Neo Mini Conical Coping Base

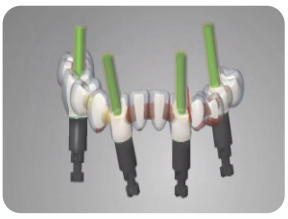
Titanium

118.382



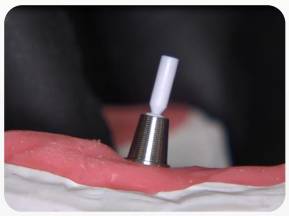
1) Working model with artificial gum.

2) Install the GM Mini Conical Abutment Scanbody on the model and proceed with the scanning.

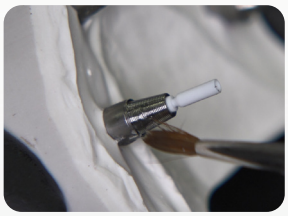


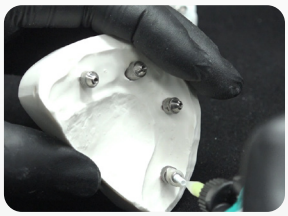
3) Design the zirconia bar in the CAD/CAM software.

4) Mill the zirconia bar.



5) Placement of both the Neo Mini Conical Abutment Coping Base and the sealing pin on top of the analog.





6) Apply a specific primer and proceed with the cementation according to the cement manufacturer.

7) Press the infrastructure over the coping base and immediately remove any overflown cement excess as well as the sealing pin.

8) Unscrew the infrastructure from the model. Final framework with ensured passivity.

9) Final framework.

REMOVABLE RESTORATION

GM NOVALOC

The GM Novaloc abutments are recommended for removable prosthesis retained by attachments, known as overdentures. The Neodent® system of overdenture over attachment is contraindicated in cases which the angulation between the implants exceeds 30º or between abutments exceeds 40º.

Follow these steps to use the GM Novaloc abutments with overdenture:

- Place the GM Novaloc abutments using the Neo Screwdriver Torque Connection with 20 N.cm;
- Place the Impression Coping on the GM Novaloc Abutment;
- Use the mucodynamic technique for impression taking (vinyl polysiloxane or polyether rubber). Send the impression to the dental lab;
- Insert the Attachment Model Analogs into the Impression Coping;
- Pour a master model using standard methods and type-4 dental stone. Note: the master model can also be created with an implant-level impression;
- Place white Processing Collars on all Model Analogs;
- Place the Matrix Housing incl. preassembled processing insert onto the GM Novaloc Abutments. Note: for a chairside polymerization of the matrix housing use the processing spacer to create the space needed;
- Process the overdenture according to standard procedures;
- The dental lab will return the finalized overdenture to the dental office including the processing inserts in place;
- Remove all processing inserts from the matrix housing using the blue Processing Insert Removal Instrument;
- Select the appropriate retention insert. Insert the retention inserts to the matrix housing using the brown Retention Insert Instrument;
- Seat the finished overdenture and check the occlusion.

GM Novaloc

GM Novaloc 15º (with removable screw)

Accessories

Equipment Box
2010.101-NOV

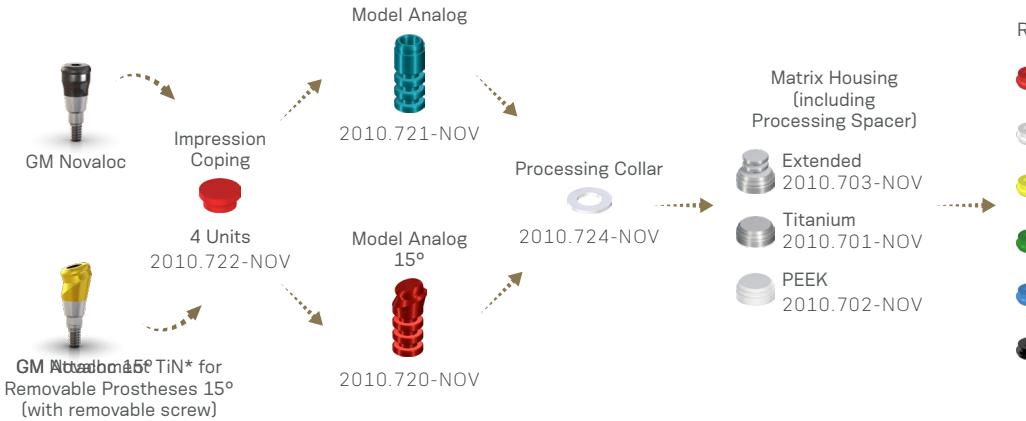
Block Out Spacer
2010.723-NOV

Processing Insert
2010.725-NOV

Matrix Housing Extraction Instrument
2010.751-NOV

Processing Insert Removal Instrument
2010.731-NOV

Retention Insert Instrument
2010.741-NOV



COMPREHENSIVE RESTORATIVE SOLUTIONS

Meet patient expectations with different possibilities of workflows and materials: customize frameworks for provisional or final restorations.

Centralized Production Center*

Provisional fixed prosthesis

Final fixed prosthesis
Straumann® CARES®/Createch Medical

*Check availability in your region

In-house CAD/CAM Solutions

Provisional fixed prosthesis

Final fixed prosthesis
Straumann® M series/ Zirkonzahn M4
For library downloads, please go to:
www.neodent.com/cadcam

Conventional Manufacturing Solutions

Provisional fixed prosthesis
Mini Conical temporary coping
Mini Conical distal bar coping

Final fixed prosthesis
One Step Hybrid

ZYGOMA GM™, ZYGOMA-S AND HELIX GM® LONG IMPLANT PACKAGING

Neodent® packaging has been specially updated for easy handling and safe surgical procedures, providing safety from implant stocking to the capture and transport to implant bed. The implant's features, such as type, diameter and length, are identifiable on the outside of the packaging.

Three self-adhesive labels are provided for recording in the patient's medical records and for reporting to the prosthesis team. They also allows traceability for all articles.

After opening the blister, note that the implant will remain attached at the lid. In order to break the base holder of the implant, hold the lid and apply a contra-torque with the GM Connection for contra-angle (a maximum torque of 20 N.cm). Or for manual installation, use the Zygoma GM™ Implant Driver with the Neo Screwdriver Torque Connection. Finish the implant placement with the aid of the Torque Wrench.

Instructions for opening and carring the implant packaging.

Note: The holder is integrated to the implant body, but is designed to be removed from the blister without any apical burr.

FOLLOW-UP

CLEANING AND CARE

For long-term success and proper fit of the fixed bridge, comprehensive patient instruction and periodic check-ups (at least once a year) are recommended. During these visits, you should carefully examine the:

1. Condition of the peri-implant tissues with regard to oral diseases such as plaque and calculus, bleeding, recession, and bone loss, by taking regular periapical radiographs.

2. Superstructure and prostheses occlusion, proper fit of the fixed bridge, wear of occlusal surface, retention, screw loosening, and abutment status.

3. Function of the prostheses.

Provide professional cleaning with the aid of ultrasonic or periodontal curettes, removing the prosthesis if necessary, and use cleaner prostheses agents. If a proper maintenance of the fixed restoration is provided, it is not necessary to exchange the occlusal screws at each check-up visit.

A full-arch prosthesis requires spaces for the framework and the esthetical veneering (can be either ceramic or acrylic). Also, from a functional point of view, full-arch bridges should allow for the patient's future hygiene and should never cover the remaining tissue, which will facilitate the patient's cleaning of the bridge.

For proper care at home, instruct the patient to clean the space between gingiva and fixed bridges, especially around the implants on a regular basis. Dental floss or interdental brushes are recommended.

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