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1.0 BASIC INFORMATION ABOUT CONE MORSE IMPLANTS

The modern implantology era, which is based on the clinical results of the concept of osseointegration, began with the first internationally published journals in 1977. Since then, Dentistry has had important changes and, today, a patient’s treatment plan usually offers implant retained and/or supported prosthesis as an affordable and reliable solution. The number of oral implants placed is rapidly increasing and this treatment concept requires specific skills and knowledge, as the surgeon’s learning curve, that are relevant for a successful result. Based on these facts, the present guide aims to provide to dental practitioners and specialists basic information and steps regarding the planning, surgical procedures and options of treatment. This guide does not replace the instructions for use (IFU) of each product, which can be found in our website: www.neodent.com.br. It is the surgeon’s responsibility to analyze the patient’s general health condition, the viability of the surgical and prosthetic procedures and the most appropriate products to each clinical situation.

Implants with internal connections have begun to produce excellent clinical results and have become widely accepted by dental surgeons, thanks to their practicality. Internal connections rapidly became popular soon after their introduction. They were seen to give improved biological and mechanical results. Originally described by Stephen A. Morse in 1864, the Morse taper connection is intended to provide a more stable and reliable connection between two parts. Tapering interface adjustments then began to be commonly used in engineering practices as Morse tapers, used to connect parts of lathes. In the dental field, internal connections were adapted for use with dental implants, where the characteristics of this fitting, such as the forces for removal, insertion and stress distribution of the parts depend on:

1. the angle of the taper;
2. the length of the contact area;
3. the internal and external diameter of the parts;
4. the depth of insertion;
5. material properties;
6. the coefficient of friction;
7. the size and mass of the male connector.

The Cone Morse (CM) Neodent implant system offers 6 different types of implant designs, threads, apex and two types of surface treatment. Neodent’s philosophy is to offer one implant solution adapted to a proper indication, which is density and amount of bone available and surgical technique. (Figure 1).
All Cone Morse (CM) implants present a Morse taper connection. The CM implants (Drive, Alvim, Titamax EX and Titamax) have an internal total angle of 11.5° and the same prosthetic connection dimension, regardless of the implant diameter (figure 2).

The platform switch concept in Neodent CM Implants has proven biological stability of the peri-implant tissue, especially when the implants are placed 1-2 mm sub crestally. The subcrestal positioning of CM Implants also reduces the stress levels in the superior bone crest. Besides that, this connection is designed to prevent bacterial migration to the implant core. The main indications of the CM Implants are:

- Drive CM: for bone type III and IV and postextraction insertion;
- Alvim CM: for bone type III and IV, postextraction insertion and for bone type I and II with the Alvim Bone Tap;
- Titamax CM EX: for bone type III and IV and for narrow bone width;
- Titamax CM: for bone type I and II and areas of block graft.

FIGURE 1. Neodent options of implants according to their indication.

FIGURE 2. Neodent CM implant connection has one width regardless of the implant diameter.
FIGURE 3. Neodent CM has a deep connection inside the implant designed to enhance the contact area between the implant and abutment.

The Neodent CM conical connection features an internal hexagon index in the lower portion called the CM Exact. It is used to surgically position the implant and reposition prosthetic abutments when working at implant level.

FIGURE 4. Internal hexagon index, created to surgically guide the implant and mold the implant during the prosthetic phase.
1.2 Facility Implants

Facility Implants also have a cone Morse connection, but with an internal angle of 5°. They are the narrowest implants offered by Neodent and their abutments are placed through friction. Their use is indicated to the upper lateral incisors’ and lower incisors’ areas.

1.3 WS Implants

WS (short implants) is a complementary line of cone Morse implants, suitable for special areas. WS Implants also feature an internal angle of 11.5°, but different internal diameter and length. Therefore, a special line of abutments is required when working with these implants. They are indicated as an alternative for posterior free ended partially edentulous ridge.

The Neodent cone Morse system has a full portfolio, adapted to the patient’s bone density and quality.
2.0 CLASSIFYING DENTAL IMPLANT PROSTHESES

There are several ways to rehabilitate patients using dental implants. To make this procedure easier, a dental implant prostheses can be classified according to:

- The level of the work: implant or abutment.
- The retention type: cement-retained or screw-retained.
- The number of elements: single [crown] or multiple.

2.1 Level of work for dental implant prostheses: Implant or Abutment Level

Dental implants are restored with the help of prosthetic abutments. These parts are screwed into the implants, acting as an abutment that elevates the position of the implant (next to the bone) to the soft tissue level, facilitating restoration. Prosthetic abutments support the soft tissue during the procedure. Figure 7 is a schematic for restoration at the implant and abutment levels.

In cases where there is little soft tissue due to anatomical limitations, poor implant positioning, or for any another reason, implants should be restored at their platform level. In such cases, abutments are no longer needed. Figures 8 and 9 show the clinical step of an impression at the implant level and impressions at the abutment level [restoration at implant level/restoration at abutment level].
Implant level restorations are carried out when there are procedures that result in customized infrastructure. This customization process can be carried out using either casting or milling (when there are digital solutions). The implant level work results in clinical procedures carried out directly on the implant, as illustrated in Figure 9. As with abutment level restorations, the implant level restorations may be screw-retained or cement-retained. Implant-level cement-retained prosthetics require a customized abutment for each specific clinical case.

Abutment level prosthetics require abutment level procedures, i.e. impressions, clinical tests, temporary restorations, etc., which should always be carried out on the abutments. In this way, this item is not removed regularly, keeping the homeostasis of the peri-implant tissues intact (Figure 8).

There are many reasons to opt for a restoration at either the implant or abutment level, especially now that digital solutions are available. However, abutment level restorations are strongly recommended when there is a minimum amount of mucosa, as they stabilize the soft tissue, provide a biological seal and mechanically protect the system.

FIGURE 8. An open tray impression being taken at the abutment level.

FIGURE 9. An open tray impression being taken at the implant level.
2.2 Type of retention: cement-retained or screw-retained prostheses

A dental implant prosthesis can either be cement-retained or screw-retained, depending on the clinical situation and the preference of the dental surgeon. Screw-retained restorations are reversible and do not present a risk of inflammation of the mucosa resulting from too much cement during placement. On the other hand, screw-retained prostheses require excellent passive connection and seating. They also require an opening on the occlusal side for the fixation screw to exit. The location of this opening must therefore be planned in order to avoid esthetic impairment. Angled abutments are strongly recommended to avoid problems when this exit point faces the oral cavity.

Cement-retained restorations are more easily finished with good esthetics, because there is no concern with the outlet of the fixation screw securing the cylinder, but they are not reversible. At the same time, excess cement should be avoided during the process of cementation of the crown. Figure 10 illustrates the difference between a screw-retained and a cement-retained dental prosthesis. Titanium bases are recommended for cement-retained or screw-retained prostheses, though cementation of the titanium base is carried out outside the mouth, in the laboratory, eliminating the risk of excess cement on peri-implant tissues. Subsequently, the structure is screwed onto the implant. More details are given in Chapter 7.

![FIGURE 10. Examples of screw-retained and cement-retained restorations.](image)

2.3 Number of elements: single (crown) or multiple restorations (bridge)

Dental implants may be used to restore gaps left by single or multiple missing teeth. Depending on the dentist’s treatment plan, they may be joined or placed separately as individual crowns. The design of prosthetic abutments and cylinders is determined by these formats, which may be anti-rotational (for crowns) or rotational (for multiple prostheses).

The selection of anti-rotational or rotational formats of the CM system also depends on whether the lower part of the abutments has the CM Exact, as well as whether there is an adjustment fitting in the copings for laboratory use. The presence or absence of an anti-rotational element on the coping establishes whether it is indicated for crowns or for multiple prostheses (Figure 11).
FIGURE 11. Indication of Abutments. The CM Abutment, Universal or Anatomic Abutments and Titanium Bases are indicated for single-unit prostheses (crowns). Mini Conical and Micro Abutments are indicated for multiple-unit prostheses (bridges). The Equator Attachment is indicated for removable total prostheses, known as overdentures.

### 3.0 GENERAL CARE IN THE SELECTION OF ABUTMENTS

The type of retention used, the level of the work, and the number of units define the selection of the abutment, as can be seen in the table below:

<table>
<thead>
<tr>
<th>Level of Work</th>
<th>Retention Type</th>
<th>Screw-retained</th>
<th>Cement-retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implant</td>
<td></td>
<td></td>
<td>Single-unit</td>
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<td></td>
<td></td>
<td>Single-unit</td>
<td>Single-unit</td>
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<tr>
<td></td>
<td></td>
<td>- CM Exact Titanium Base</td>
<td>- CM Exact Titanium Base</td>
</tr>
<tr>
<td>Abutment</td>
<td></td>
<td>Multiple-unit</td>
<td>Single-unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- CM Micro Abutment</td>
<td>- CM and CM Exact Anatomic Abutments (straight and 17°)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- CM Mini Conical Abutment</td>
<td>- CM and CM Universal Abutments (straight/17°/30°)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 17°/30° CM Exact Mini Conical Abutment</td>
<td>- 2-Piece CM Universal Abutment</td>
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<tr>
<td></td>
<td></td>
<td>- CM Equator Attachment</td>
<td>- Facility Anatomic Abutment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Facility Micro Abutment</td>
<td>- WS Micro Conical Abutment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Facility Equator Attachment</td>
<td>- WS Universal Abutment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- WS Mini Conical Abutment</td>
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</tr>
</tbody>
</table>

Once the abutment is selected, other characteristics also need to be determined, as each abutment has a different transmucosal height, shape and angle. The main characteristics of an abutment are:

A. Diameter;
B. Interocclusal height (from the abutment);
C. Transmucosal height;
D. Angle [the CM line includes straight, 17° and 30° options].
4.0 GENERAL POINTS TO BE NOTED IN THE PLACEMENT OF ABUTMENTS

Abutments are placed during the following stages: (1) in the healed mucosa (after removal of healing abutments or temporary crowns); or (2) during surgery with or without flaps, soon after the positioning of the implant (in the case of immediate loading); or (3) after the removal of the cover screws (when abutments are placed instead of healing abutments).

After the abutment type is selected, the following characteristics should be considered for the determination of your design:

A. Interocclusal space, height, and diameter;
B. Transmucosal height (gingival);
C. Biological space (distance between the abutment and the bone crest);
D. If there is a need for angular correction of the implant with the abutment or if it is parallel to adjacent abutments.

In addition to the relationship between healing abutments and abutments, other important biological aspects are described to facilitate this step.

4.1 Overview of Cone Morse Healing Abutments

The Neodent CM range includes a variety of healing abutments, with different diameters and transmucosal heights, designed to adapt to the final abutments. The correct choice of this element determines adequate healing of soft tissues, controlling pressure while maintaining the biological distance.

There are a number of standard CM healing abutment formats, which can be selected according to the needs of the dental surgeon:
CM Healing Abutments were strategically designed to ensure the correct emergence profile, adapted to all CM Abutaments, as described in the figure below:

**WS Healing Abutment**

- Ø 4.5 mm
- Transmucosal height: 0.8 - 3.5 mm

**Facility Healing Abutment**

- Ø 2.3 mm
- Transmucosal height: 1.5 - 4.5 mm

**Notes:**
- CM and WS Healing Abutments are positioned with the 1.2 Manual Screwdriver. Do not exceed 10 N cm torque.
- Facility Healing Abutments are positioned by one impact (tap) along the axis of the implant with the Abutment Placement Aid.
- 1.5 mm Facility Healing Abutment can also be used as a cover screw.

**FIGURE 12.** Relationship between the design of healing abutments and the dimensions of CM abutments.
### 4.1.1 Overview of Cone Morse Abutments and their corresponding Healing Abutments

#### CM screw-retained options

<table>
<thead>
<tr>
<th>Type</th>
<th>Mini Conical Abutment</th>
<th>17°/30° CM and Exact Mini Conical Abutment</th>
<th>Micro Abutment</th>
<th>Abutment</th>
<th>Equator Attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø Available</td>
<td>4.8 mm</td>
<td>4.8 mm</td>
<td>3.3 mm</td>
<td>4.8 mm</td>
<td>4.8 mm</td>
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<tr>
<td>Transmucosal Heights</td>
<td>0.8 mm</td>
<td>0.8 mm</td>
<td>0.8 mm</td>
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</table>

<table>
<thead>
<tr>
<th>Corresponding Healing Abutment</th>
<th>CM and Exact Anatomic Abutment</th>
<th>CM and Exact Lateral Anatomic Abutment</th>
<th>CM and Exact Universal Abutment</th>
<th>CM and Exact Universal Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø Available</td>
<td>6.0 mm (buccal)/5.0 mm (lateral)</td>
<td>4.7 mm (buccal)/4.3 mm (lateral)</td>
<td>3.3 mm</td>
<td>4.5 mm</td>
</tr>
<tr>
<td>Transmucosal Heights</td>
<td>1.5 mm</td>
<td>1.5 mm</td>
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</table>

#### CM cement-retained options

<table>
<thead>
<tr>
<th>Type</th>
<th>CM and Exact Anatomic Abutment</th>
<th>CM and Exact Lateral Anatomic Abutment</th>
<th>CM and Exact Universal Abutment</th>
<th>CM and Exact Universal Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø Available</td>
<td>4.5 mm</td>
<td>4.5 mm</td>
<td>3.3 mm</td>
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<tr>
<td>Transmucosal Heights</td>
<td>1.5 mm</td>
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</tbody>
</table>
### Facility options

<table>
<thead>
<tr>
<th>Type</th>
<th>Facility Anatomic Abutment</th>
<th>Facility Micro Abutment</th>
<th>Facility Equator Attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abutment</td>
<td>1.5 mm 2.5 mm 3.5 mm</td>
<td>1.5 mm 2.5 mm 3.5 mm</td>
<td>1.5 mm 2.5 mm 3.5 mm 4.5 mm</td>
</tr>
<tr>
<td>Transmucosal Heights</td>
<td></td>
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</tr>
<tr>
<td>Corresponding Healing Abutment</td>
<td>1.5 mm 2.5 mm 3.5 mm</td>
<td>1.5 mm 2.5 mm 3.5 mm</td>
<td>1.5 mm 2.5 mm 3.5 mm 4.5 mm</td>
</tr>
<tr>
<td>Transmucosal Heights</td>
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</tbody>
</table>

Note: the Facility 1.5 Healing Abutment can also be used as cover screw.

### Abutment options

<table>
<thead>
<tr>
<th>Type</th>
<th>WS Mini Conical Abutment</th>
<th>WS Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø Available</td>
<td>4.8 mm 4.5 mm</td>
<td>4.8 mm 4.5 mm</td>
</tr>
<tr>
<td>Transmucosal Heights</td>
<td>0.8 mm 1.5 mm 2.5 mm 3.5 mm</td>
<td>0.8 mm 1.5 mm 2.5 mm 3.5 mm</td>
</tr>
</tbody>
</table>

### Corresponding Healing Abutment options

<table>
<thead>
<tr>
<th>Type</th>
<th>WS Universal Abutment</th>
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<tbody>
<tr>
<td>Ø Available</td>
<td>4.5 mm</td>
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<tr>
<td>Transmucosal Heights</td>
<td></td>
</tr>
<tr>
<td>Corresponding Healing Abutment</td>
<td>0.8 mm 1.5 mm 2.5 mm 3.5 mm</td>
</tr>
</tbody>
</table>

Note: for WS implants, there are specific Cover Screws and Healing Abutments.
4.2 Biological care when placing Cone Morse abutments

Cone Morse implants are usually placed in the intraosseal position. This results in a certain amount of bone tissue on the cervical portion of the implant, which may impact the abutments placed on the implants. For such situations, Neodent provides the CM Bone Profile Drill, which allows the correct adaptation of the surrounding bone, without it pushing up against the abutment. The CM Height Measurer is used to check and select the correct transmucosal height of the abutment, as shown in the image below.

The margin of the abutment should not be closer than 1.5 mm to the bone crest and no more than 2 mm under the mucosa. The images below illustrate different situations using Try-In Abutments available in the CM Try-In Kit.

Example of negative situation, in which the abutment is colliding against the bone crest.

Example of correct situation, in which the abutment respects the biological space of the peri-implant soft tissues.
5.0 TRANSFER OF THE IMPLANT OR ABUTMENT AND MODEL PRODUCTION

The implant can be transferred for laboratory work and production of the prosthesis in different ways, as modern prostheses can be fabricated by conventional casting procedures (conventional flow) or through the use of milling and CADCAM technology. This chapter covers conventional impression techniques and scanning methods (of the model and intraoral).

5.1 Transfer of implants/abutments (open or closed tray impressions)

The procedure for transferring implants or abutments is combined with that of taking conventional dental impressions. It can be carried out using open or closed trays. Individual items, known as impression copings, are screwed or adapted to the abutments or directly onto the implants.

With the closed tray technique, a negative impression of the piece is made on the impression material. The impression coping is then removed from the oral cavity and adapted to the impression material in the tray. Some special closed tray impression copings are made in plastic and captured directly by the impression material. Each abutment has its own impression system and each option should be reviewed in the catalog or working protocol.

In the case of impression copings for Cone Morse implants, there are two options available for the transfer of the impression: open or closed tray. There are also two length options available, depending on the transmucosal height and the final position of the implant. These options are described below.

<table>
<thead>
<tr>
<th>Open tray</th>
<th>Closed tray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>![Image of Conventional Open Tray]</td>
</tr>
<tr>
<td>Long</td>
<td>![Image of Long Open Tray]</td>
</tr>
</tbody>
</table>

Generally, the transfer sequence for abutments follows the same workflow as that set out for the transfer of implants (open or closed), but with the impression copings adapted to each abutment. The characteristics of each abutment should be noted, as only some allow for either an open or closed transfer process to be used.
5.2 Model Production

First, the impression should be checked, mainly to ensure that the impression coping is correctly adjusted and positioned. The following steps should be carried out in the laboratory:

A. Analog (implant or abutment, depending on the technique) is positioned. It should fit exactly as shown in the figure below:

![Image of analog placement](image)

B. Use the preferred artificial gingival material to make a removable and accurate model with 3 to 4mm of depth (follow the manufacturer’s instructions for the material used for making the artificial gum indicated in the respective IFU);

C. Prepare the mixture using Type IV plaster. Mix the powder and the water correctly, following the manufacturer’s instructions;

D. Pour the plaster mixture into the impression. Make sure that the plaster coats all anatomical details and, in particular, that it covers the analog completely;

E. Wait the recommended time for the plaster to set and then carefully remove the template from the impression tray;

F. Check that there are no bubbles and that all the details have been completely copied;

G. Finish the model;

H. It is also important to model the opposing dentition and mount both in an articulator.
6.0 SCANNING AND DIGITAL SOLUTIONS

Modern dentistry is becoming increasingly digital. Scanning solutions range from digitalization of the impression in the impression tray to direct scanning of the patient’s oral cavity (intraoral scanning). When the digital model is ready, specialized technicians begin to design the future prosthesis, which will be milled in a CAM machine.

6.1. Scanbody

The scanbody is used on an implant and/or abutment in order to transfer their positions following scanning for use in the CAD/CAM procedure. This is used to realign the library of implants/abutments with the correct position, according to the reference implant/abutment. There are two types of scanbodies: one is used for plaster model scanning (for analogs) and one for intraoral scanning (for implants and abutments). The Neodent scanbodies are made in Peek, an opaque polymer that eliminates the need for any type of opaquing spray.

FIGURE 13. Samples of scanbodies, crucial pieces for the digitalization of models or patients.
6.2 Digital workflow prostheses (CADCAM)

6.2.1 Scanning a plaster model

Once the plaster model is made (Item 5.1 - Transfer of implants/abutments), it can be scanned. This technique requires a plaster model scanner or a bench scanner. Neodent Digital Solutions recommends the following scanners: Ceramill® Map400, Straumann® CARES® & Dental Wings™ 7Series.

For this step, the appropriate library must be installed in the software (Libraries are available for the following software: exocad GmbH, Amann Girrbach AG Inc, Dental Wings Inc and 3Shape A/S at http://en.neodent.com.br/downloads-available with your local distributor). Make sure that your CAD library is up to date.

The order of the following steps may vary depending on the software and scanner used, but will be basically the same for all:

A. Start the software database/chosen scanner;
B. Select the correct option and material for the case and make sure that the selected library matches the scanbodies that are to be used;
C. The steps set out by the scanner’s manufacturer must be followed, though what is important is to scan the plaster model with and without the removable gum (usually carried out at different steps) and, of course, to scan with the analog of the implant or abutment in position.

Notes:
- The flat surface of the scanbody should be positioned towards the oral cavity;
- Make sure that the scanbody is properly seated;
- Scanbodies where the implant platform is damaged may lead to digitalization problems.

After digitalization, design the prosthesis with the CAD software. The same care should be taken when using an intraoral scanner.
6.2.2 Intraoral Scanning

Dentists will need an Intraoral (IO) scanner available at their practice. The dental laboratory receives an e-mail with the file instead of a package with the physical impression. The intraoral scanning process must follow all the clinical cares and safety instructions that dentists are used to and also follow the step-by-step of the IO scanner manufacturer. Scanners indicated to Neodent Scanbodies are: TRIOS® by 3Shape A/S and DW IO by Dental Wings Inc. In general, scanning procedures are similar for every scanning system.

A. In the software, completely fill in the order form;
B. Use the correct intraoral scanbody, according to the chosen abutment or CM implant;
C. Select the indication, material and specify which implant element is needed;
D. Follow the step by step indicated by the scanner manufacturer;
E. Finalize the scan process following the software instructions;
F. The final scanning files should be sent to the CAD software (Chairside or send to a dental laboratory with CAD/CAM system).

Notes:
- The flat surface of the scanbody should be positioned towards the oral cavity;
- Make sure that the scanbody is properly seated;
- Scanbodies where the implant platform is damaged may lead to digitalization problems.

7.0 ABUTMENT OPTIONS

7.1 The implant level (screw-retained or cement-retained)

7.1.1 CM Pro Peek Abutment (temporary abutment)

The CM Pro Peek Abutment is a temporary abutment composed of two parts: the first is the body made of Peek (a high-performance polymer) in cylindrical shape - which can be customized - and the second is manufactured from titanium, to be seated in the implant using the CM Exact indexer. The CM Pro Peek Abutment should be customized to determine and establish the emergence profile during the period of healing of peri-implant tissues prior to final selection of an abutment. Peek is an easily prepared dental material when compared to other materials, and is biocompatible.

The CM Pro Peek Abutment is available in different diameters and different transmucosal heights, as follows:
The CM Exact Titanium Base allows in-house milling (in the laboratory or labside) with the Neodent Originals Program. It is recommended for single prosthesis; copings and crowns cemented in the laboratory and screwed onto the implant in the mouth.

CM Exact Titanium Base is available with a cementable area of 4 mm and does not permit customization. There is also a line of CM Exact Titanium Bases to be used in CEREC® units, with a cementable area of 4.7 mm. In this case, scanposts and scanbodies may be acquired directly through Dentsply Sirona™. CM Exact Titanium Bases share the following characteristics:

To use the CM Pro Peek Abutment, the following steps should be followed:

A. Select the CM Pro Peek Abutment according to the treatment planning, respecting the biological tissues as previously described and install it (15 N cm with Hex Screwdriver 0.9 Torque Connection);
B. Make sure that the abutment is aligned with the insertion axis of the implant;
C. Ensure that it is perfectly seated on the Implant (using periapical X-ray);
D. Prepare the CM Pro Peek abutment with a high-speed in the patient’s mouth. Make sure there is a minimum minimum of 5mm of Peek remaining;
E. Create and adapt a temporary restoration to condition the emergence profile and soft tissue;
F. Test the adaptation of the prosthetic structure;
G. Cement the restoration using the manufacturer’s instructions:
   - Important to protect the access of the screw;
   - Be aware to keep the mucosa free of cement excess.

7.1.2 CM Exact Titanium Base
After scanning, the following steps should be followed:
A. Launch the CAD software;
B. Carefully select the CM Exact Titanium Base in the CAD software library;
C. Proceed with the normal CAD design;
D. Complete the design and start the milling process (CAM);
E. Mill the coping/crown in-house;
F. As the restoration is in the final phase, test its fit to the titanium base, preferably in the mouth of the patient;
G. The CM Exact Titanium Base should be cemented in the laboratory;
H. Screw the CM Exact Titanium Base onto the analog of the model;
I. Protect the access to the screw;
J. Follow the cement manufacturer’s instructions for use. The CM Exact Titanium Base has been tested with chemically-activated resinous cements (e.g.: Panavia™ – Kuraray America, Inc.);
K. Apply the cement to the CM Exact Titanium Base and apply pressure to the restoration;
L. The restoration should be pressed onto the CM Exact Titanium Base and any excess cement removed immediately;
M. Remove the analog infrastructure after the cement sets and remove any remaining cement surrounding the CM Exact Titanium Base;
N. Before placing the prosthesis in the mouth, give it a final clean:
- Immerse the piece completely in a solution of enzymatic detergent (diluted according to the manufacturer’s instructions);
- Leave in the ultra-sonic cleaning equipment for approximately 10 to 15 minutes;
- Rinse thoroughly with distilled water to completely remove any remaining solution;
- The use of nylon brushes is recommended;
- Dry with a clean, dry cloth or with compressed air;
- Perform a visual inspection, noting possible failures in the cleaning process. If there is any remaining dirt, the part must be immersed again in the enzyme solution and, if necessary, cleaned with the aid of a nylon brush. Repeat the process of rinsing and drying.

O. Proceed with the placement in the mouth (15 N.cm torque with the Hex Screwdriver 0.9 Torque Connection);
P. Make sure that the prosthesis is aligned with the axis of insertion of the implant;
Q. Make sure that the prosthesis is perfectly positioned over the implant and that the estoration is not pressing the peri-implant tissues (with the aid of a periapical X-ray).

Note: Check in the IFU the indication of minimum thickness, maximum angulation and other important information on the CM Exact Titanium Bases.

### 7.2 Abutment level

#### 7.2.1 Over CM Implants

**7.2.1.1 CM Abutment (single-unit screw-retained)**

The CM Abutment is made of titanium alloy, in accordance with ASTM Standard F136, recommended for screw-retained single prostheses (crowns).
Follow these steps to use the CM Abutment:

A. Check that the soft tissue and emergence profile are ready;
B. Select the appropriate CM Abutment according to the treatment plan, respecting the biological tissues, as previously described;
C. Place the CM Abutment with the Hex Screwdriver 1.6 Torque Connection (32 N.cm);
D. Make sure it fits well and it is aligned with the axis of insertion of the implant and follow the transfer sequence, already described in chapter 5.1 (transfer);
E. Produce a provisional crown using the Titanium Coping or insert a Protection Cylinder;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
G. Place the final restoration with the Hex Screwdriver 1.2 Torque Connection (10 N.cm).
H. Make sure that the CM Abutment is perfectly positioned over the implant and that the restoration is not pressing the peri-implant tissues (with the aid of a periapical X-ray).

7.2.1.2 CM Mini Conical Abutment and CM Micro Abutment (multiple screw-retained)

The CM Mini Conical Abutment and the CM Micro Abutment are recommended for use with multiple removable prostheses and prosthesis bars. The main difference between the abutments is the diameter, as shown in the following images.
Note: CM Micro Abutment is used for multiple-unit prostheses and is not available with different angles.

The CM Mini Conical Abutment is available with different angles (straight, 17° and 30°). Angled abutments are available in non-indexed or with CM Exact versions. They permit different transmucosal heights, as shown below:
Follow these steps to use the CM Mini Conical Abutment or the CM Micro Abutment:

A. Check that the soft tissue and emergence profile are ready;
B. Select the appropriate abutment in accordance with the treatment plan, respecting the biological tissues, as previously described;
C. Place the Abutment:
   - the CM Mini Conical Abutment and CM Micro Abutment applying a torque of 32 N.cm, using the Prosthetic Abutment Driver;
   - 17º/30º CM or Exact Mini Conical Abutment applying a torque of 15 N.cm, using the Hex Screwdriver 0.9 Torque Connection;
D. Make sure it fits well and it is aligned with the axis of insertion of the implant and follow the transfer sequence, already described in chapter 5.1 (transfer);
E. Produce a provisional crown using the Titanium Coping or insert a Protection Cylinder;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
G. Place the definitive restoration with the Hex Screwdriver 1.2 Torque Connection (10 N.cm);
H. Ensure that the abutment is perfectly positioned over the implant and that the restoration is not pressing the peri-implant tissues (with the aid of a periapical X-ray);
CM Mini Conical Abutment placement

CM Anatomic Abutment is indicated for single-unit cement-retained prostheses. It has two shapes, one standard, indicated for upper central incisors, and one for upper lateral incisors and lower incisors. It can be worked in two different sequences: the first one is to insert the abutment over the implant and to perform the impression as a dental preparation. In this case, the provisional crown should be made by the dentist. The second sequence is to take the impression from the platform of the implant with the corresponding impression coping, to use the CM Anatomic Abutment over the CM Implant Analog and to perform the prosthesis in the laboratory. The fixture should then be placed in mouth. Each model of the CM Anatomic Abutment is available in a straight or angled version (17°), indexed with Exact or not.

Transmucosal height: 1.5, 2.5, and 3.5 mm

Exacting or non-indexed

Hex Screwdriver 0.9 Torque Connection for insertion
There follow the dimensions of each shape of CM Anatomic Abutment:

**CM Lateral Anatomic Abutment**

- 4.7 mm (Transmucosal)
- 4.3 mm

**CM Anatomic Abutment**

- 6 mm
- 8 mm

---

**CM Lateral Anatomic Abutment**

- 2.8 mm
- 1.5 mm
- 3.8 mm

**CM Anatomic Abutment**

- 2.5 mm
- 4.8 mm
- 3.5 mm

---

**CM Lateral Anatomic Abutment**

- 2.8 mm
- 1.5 mm
- 3.8 mm

**CM Anatomic Abutment**

- 2.5 mm
- 4.8 mm
- 3.5 mm
- 5 mm
Follow these steps to work with CM Anatomic Abutment in the indicated sequence:

A. After placing the CM Anatomic Abutment, with the Hex Screwdriver 0.9 Torque Connection and 15 N.cm torque;
B. Take the impression from the abutment using the same technique as the one for dental preparations;
C. Make a provisional crown over the CM Anatomic Abutment;
D. Send the impression to the lab for the model to be produced;
E. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
F. After temporalization, make sure that the soft tissues and emergence profile are ready;
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the peri-implant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).

For the second optional sequence for the CM Anatomic Abutment, follow these steps:

A. Carefully adapt one of the CM Implant Impression Copings over the implant and take the impression;
B. Place the CM Implant Analog in the Impression Coping, produce the plaster model and send it to the laboratory, along with the CM Anatomic Abutment;
C. Use another CM Abutment for temporalization, or make a provisional adhesive crown supported by a CM Healing Abutment;
D. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
E. After temporalization, make sure that the soft tissues and emergence profile are ready;
F. Insert the CM Anatomic Abutment with the Hex Screwdriver 0.9 Torque Connection and 15 N.cm torque;
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the peri-implant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).
The CM Universal Abutment is intended to be used for cement-retained single prostheses. It has two different diameter options, two heights of cementable areas and can be straight or angled (17° or 30°). The same sequence described for the CM Anatomic Abutment should be followed. It can feature the CM Exact index or not.

Note: straight CM Universal Abutments should be installed with Hex Screwdriver 1.2 Torque Connection and 32 N.cm torque. Angled CM Universal Abutments and straight or angled CM Exact Universal Abutments should be installed with Hex Screwdriver 0.9 Torque Connection and 15 N.cm torque.

The dimensions of CM Universal Abutments are shown below:
CM Universal Abutments are available indifferent angles (straight, 17° and 30°) for all formats offered. Angled abutments permit different transmucosal heights, as shown below:

![Image of CM Universal Abutments](image)

CM Universal Abutment Impression Copings are identified by colors, according to the height of the cementable area (yellow for 4 mm and blue for 6 mm):

![Image of CM Universal Abutment Impression Copings](image)

The following steps should be used when placing the CM Universal Abutment:

A. When the healing abutments are removed, the CM Universal Abutment can be used immediately, given that there is the option to use acrylic copings for temporary crowns, and the emergence profile can be defined from them;

B. Place the CM Universal Abutment (32 N.cm with Hex Screwdriver 1.2 Torque Connection for straight CM Universal Abutments and 15 N.cm with Hex Screwdriver 0.9 Torque Connection for the other Universal Abutments) and produce a temporary crown;

C. After temporalization, make sure that the soft tissue and emergence profile are ready;

D. Take the impression with the aid of the CM Universal Abutment Impression Coping (if the abutment wasn’t customized). Make sure the closed-tray impression coping is well adapted over the abutment;
E. Send the impression to the laboratory and produce a model, inserting the chosen analog in the impression coping;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the peri-implant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).

7.2.1.5 2-Piece CM Universal Abutment (single-unit cement-retained, non-indexed)

2-Piece CM Universal Abutment (non-indexed) is indicated when the CM implant placed does not have the CM Exact index.
Follow these steps to work with the 2-Piece CM Universal Abutment:

A. Carefully place one of the CM Implant Impression Copings over the implant and take the impression;
B. Place the CM Implant Analog in the Impression Coping, produce the plaster model and send it to the laboratory, along with the 2-Piece CM Universal Abutment;
C. Use another CM Abutment for temporalization, or make a provisional adhesive crown supported by a CM Healing Abutment;
D. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CAD/CAM);
E. After temporalization, make sure that the soft tissues and emergence profile are ready;
F. Insert the CM Anatomic Abutment with the Hex Screwdriver 0.9 Torque Connection and 15 N.cm torque;
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the peri-implant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).

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### 7.2.1.6 CM Equator Attachment (overdenture)

CM Equator Attachment is recommended for total removable prostheses supported by implants, known as overdentures. It allows a total angulation of 30° between two implants. Its smaller dimensions require less amount of abrasion to adapt it in the prostheses. CM Equator Attachments offer stronger retention force (provided by the purple o’ring), when compared to Mini Ball attachments. They also do not require the use of positioners for capturing. To this technique, it is indicated the placement of two CM implants.
Follow these steps to use the CM Equator Attachment with overdenture:
A. Install the CM Equator Attachment, with Hex Screwdriver 1.2 Torque Connection and 32 N.cm torque;
B. Make a new total prosthesis for the patient;
C. Position the protection disk over the CM Equator Attachment and, over them, the O’ring with Cylinder;
D. Make a relief in the new prosthesis, in the region where the O’ring with Cylinder will be placed and check for correct fit and lack of interferences;
E. Capture one cylinder at a time, with the aid of acrylic resin;
F. After capturing the two cylinders, remove the protection disk from the CM Equator Attachment;
G. Polish the prosthesis and install it.
7.2.2 Over WS Implants

7.2.2.1 WS Abutment (single-unit screw-retained)

WS Abutment is made of titanium alloy, in accordance with ASTM Standard F136. It is recommended for screw-retained single prostheses (crowns), in the posterior region of the alveolar ridge.

Follow these steps to work with the WS Abutment:

A. Make sure that the soft tissue and emergence profile are ready;
B. Select the appropriate WS Abutment according to the treatment plan, respecting the biological tissues, as previously described;
C. Place the WS Abutment with the Hex Screwdriver 1.6 Torque Connection (32 N.cm);
D. Make sure it fits well and follow the transfer sequence already described in chapter 5.1 (transfer);
E. Produce a provisional crown using the Titanium Coping or place a Protection Cylinder;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CADCAM);
G. Place the final restoration with the Hex Screwdriver 1.2 Torque Connection (10 N.cm);
H. Ensure the WS Abutment is aligned with the axis of insertion of the implant;
I. Make sure that the WS Abutment is perfectly positioned over the implant and that the restoration is not pressing the peri-implant tissues (with the aid of a periapical X-ray).
7.2.2.2 WS Mini Conical Abutment (multiple-unit screw-retained)

The WS Mini Conical Abutment is recommended for use with multiple screw-retained prostheses and bars, in the posterior region of the alveolar ridge.

Follow these steps to work with the WS Mini Conical Abutment:
A. Make sure that the soft tissue and emergence profile are ready;
B. Select the WS Mini Conical Abutment according to the treatment planning, respecting the biological tissues as previously described;
C. Place the WS Mini Conical Abutment with 32 N.cm torque, using the Prosthetic Abutment Driver;
D. Check that the impression coping fits well and follow the sequence already described in chapter 5.1 (transfer);
E. Produce a provisional crown using the Titanium Coping or place a Protection Cylinder;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CADCAM);
G. Place the definitive prosthesis with the Hex Screwdriver 1.2 Torque Connection (10 N.cm).
H. Ensure that the WS Mini Conical Abutment is aligned with the long insertion axis of the implant.
I. Make sure that the WS Mini Conical Abutment is perfectly seated on the Implant and that the restoration is not stressing any peri-implant tissue (using periapical X-ray).
Follow these steps to use the WS Universal Abutment:

A. When the healing abutments are removed, the WS Universal Abutment can be used immediately, given that there is the option to use acrylic copings for temporary crowns, and the emergence profile can be defined from them;

B. Install the WS Universal Abutment (32 N.cm with Hex Screwdriver 1.2 Torque Connection) and produce a temporary crown;

C. After temporalization, make sure that the soft tissue and emergence profile are ready;

D. Take the impression with the aid of the WS Universal Abutment Impression Coping (if the abutment wasn’t customized). Make sure the closed-tray impression coping is well adapted over the abutment;

The WS Universal Abutment is intended to be used for cement-retained single prostheses, in the posterior region of the alveolar ridge. It has two cementable area heights, 4 or 6 mm, and is available as two pieces: body and screw. The same sequence described for the CM Anatomic Abutment should be followed.

The WS Universal Abutment Impression Copings are identified by colors, according to the height of the cementable area (yellow for 4 mm and blue for 6 mm high):

Follow these steps to use the WS Universal Abutment:

A. When the healing abutments are removed, the WS Universal Abutment can be used immediately, given that there is the option to use acrylic copings for temporary crowns, and the emergence profile can be defined from them;

B. Install the WS Universal Abutment (32 N.cm with Hex Screwdriver 1.2 Torque Connection) and produce a temporary crown;

C. After temporalization, make sure that the soft tissue and emergence profile are ready;

D. Take the impression with the aid of the WS Universal Abutment Impression Coping (if the abutment wasn’t customized). Make sure the closed-tray impression coping is well adapted over the abutment;
E. Send the impression to the laboratory and produce a model, inserting the chosen analog in the impression coping;
F. The laboratory technician then produces the piece using conventional techniques (lost-wax) orvmilling (CADCAM);
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the periimplant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).

<table>
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### 7.2.3 Over Facility Implants

#### 7.2.3.1 Facility Micro Abutment (multiple-unit screw-retained)

The Facility Micro Abutment is recommended for use with multiple prostheses and bars. The Facility abutments are placed with 3 impacts (taps) in the implant axis with the Facility Abutment Placement Aid.

Follow these steps to work with the Facility Micro Abutment:
A. Check that the soft tissue and emergence profile are ready;
B. Select the appropriate Facility Micro Abutment in accordance with the treatment plan, respecting the biological tissues as previously described;
C. Place the Facility Micro Abutment with three impacts of the Facility Abutment Placement Aid in the axis of the implant;
D. Ensure the Impression Coping is well fitted over the Facility Micro Abutment and follow the regular sequence of implant transferring already described in chapter 5.1;
The Facility Anatomic Abutment is indicated for single-unit cement-retained prostheses, for upper lateral incisors and lower incisors. The impression can be taken from the implant platform with the aid of the Facility Implant Impression Coping. Using its analog, the prosthesis should be produced in the laboratory over the Anatomic Abutment, and the fixture installed in mouth.

### 7.2.3.2 Facility Anatomic Abutment (single-unit cement-retained)

The Facility Anatomic Abutment is indicated for single-unit cement-retained prostheses, for upper lateral incisors and lower incisors. The impression can be taken from the implant platform with the aid of the Facility Implant Impression Coping. Using its analog, the prosthesis should be produced in the laboratory over the Anatomic Abutment, and the fixture installed in mouth.

Follow these steps to work with Facility Anatomic Abutment:

A. Carefully adapt the Facility Implant Impression Coping over the implant and take the impression;

B. Place the Facility Implant Analog in the Impression Coping, produce the plaster model and send it to the laboratory, along with the Facility Anatomic Abutment;
C. Use another Facility Anatomic Abutment for temporalization, or make a provisional adhesive crown supported by a Facility Healing Abutment;
D. The laboratory technician then produces the piece using conventional techniques (lost-wax) or milling (CADCAM);
E. After temporalization, make sure that the soft tissues and emergence profile are ready;
F. Place the Facility Anatomic Abutment with three impacts of the Facility Abutment Placement Aid in the axis of the implant;
G. Cement the final prosthesis;
H. Ensure that it fits perfectly on the abutment and that the prosthesis is not pressing on the peri-implant tissue. Also check for a possible excess of cement (with the aid of periapical X-ray).

### 7.2.3.3 Facility Equator Attachment ( overdenture )

Facility Equator Attachment is indicated for total removable prostheses supported by Facility implants, known as overdentures. It allows a total angulation of 30° between two implants. Its smaller dimensions require less amount of abrasion to adapt it in the prostheses. Facility Equator Attachments offer stronger retention force (provided by the purple o’ring), when compared to Mini Ball attachments. They also do not require the use of positioners for capturing. To this technique, it is indicated the placement of two Facility implants.
Follow these steps to use the Facility Equator Attachment with overdenture:
A. Place the Facility Equator Attachment with three impacts of the Facility Abutment Placement Aid in the axis of the implant;
B. Make a new total prosthesis for the patient;
C. Position the protection disk over the Facility Equator Attachment and, over them, the O’ring with Cylinder;
D. Make a relief in the new total prosthesis, in the region where the O’ring with Cylinder will be placed e check for correct fit and lack of interferences;
E. Capture one cylinder at a time, with the aid of acrylic resin;
F. After capturing the two cylinders, remove the protection disk from the Facility Equator Attachment;
G. Polish the prosthesis and install it.

### 8.0 OVERVIEW OF TORQUES AND CONNECTIONS

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</table>
9.0 CONVENTIONAL WORKFLOW FOR PROSTHESES (LOST-WAX TECHNIQUE, TEMPORARY CROWNS, ETC.)

Select the preferred abutment as appropriate for the case, and follow the workflow described in the table below:

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<tr>
<th>Cylinder</th>
<th>Indication</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium or Polymer</td>
<td>Provisional/Temporary</td>
<td>- Select a Titanium Coping or a Provisional Polymer Coping; - Fix the Coping on the analog and customize to match the interocclusal space available; - Prepare the provisional prosthesis; - Test the passivity and the fit of the prosthesis structure to the coping; - Secure the coping on the abutment and check the occlusion; - Temporary crowns can be made in the laboratory or in the dental office (chairside).</td>
</tr>
<tr>
<td>CoCr</td>
<td>Definitive Prostheses</td>
<td>- Place the coping onto the analog in the plaster cast; - Apply wax to the restoration; - The thickness of the wax must be, at least, 0.5 mm, and can be reduced to 0.3 mm after overcasting; - Prepare the base of the coping for casting and add the covering; - The alloy must be compatible with the esthetic material and the CoCr base; - Do not apply the porcelain directly onto the CoCr base; - Apply the porcelain (specific for this type of alloy) directly over the area not covered by the metallic alloy for overcasting, as this can cause cracks; - Ensure that the original format of the screw access opening is preserved; - Polishing Protectors are recommended during finishing and polishing procedures; - Do not use corrosive materials during the finishing of the alloy, as they main contain iron particles.</td>
</tr>
<tr>
<td>Castable</td>
<td>Definitive Prostheses</td>
<td>- Place the coping onto the analog on the plaster cast; - Apply wax to the restoration; - Prepare the base of the coping for casting and add the covering; - Continue with casting and finishing processes; - Ensure that the original format of the screw access opening is preserved, when using a screw-retained prosthesis.</td>
</tr>
</tbody>
</table>

10.0 CM ABUTMENT TRY IN KIT

To help choosing healing abutments and prosthetic components (as described in item 4.2, page 17), Neodent has developed a CM Prosthetic Try in Kit with all of the possible combinations of width, transmucosal height, angulation and interocclusal height of the CM Abutment line. It is a cassette composed with titanium pieces similar to abutments. Every component has individual dimensions replicating important references for diagnosing the spaces.
11.0 NEODENT TECHNIQUES

11.1 One Step Hybrid

This technique allows the passive fitting of prostheses, without the need for welding, by cementing the Titanium Coping onto the metal structure. It is indicated for multiple-unit screw-retained prostheses and results in reduced laboratory work times. It can be performed over CM Abutments, CM Mini Conical Abutments, CM Micro Abutments, WS Mini Conical Abutments or Facility Micro Abutments. The sequence to perform the One Step Hybrid technique is described in the following images.
1) Normalization of 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 5 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 ratios. After splinting impression copings, 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.

9) Castable One Step Hybrid Coping, Brass One Step Hybrid Coping, grooved Titanium One Step Hybrid Coping, with lower dimensions than the brass one, which compensates using the mill.
10) Brass Copings are placed over analogs, then Castable Copings are fixed by working screws.

11) Castable ring with waxed framework.

12) Cast framework.

13) Adapting the framework over the stone model.

14) Please note cementing area.

15) Cementing with Panavia™ (Kuraray America, Inc) the structure over the Titanium copings.

16) Final inside-mouth view.
11.2 Distal Bar

This technique is used to ease mandible rehabilitations, by a provisional total prosthesis supported by implants. The prosthesis is then more resistant to fractures, due to the resulting cantilever. The Distal Bar technique can be performed over CM Abutments, CM Mini Conical Abutments or WS Mini Conical Abutments. The technique is described by the following images:

1) Neodent Abutments placed.
2) Prostheses wearing, keeping posterior region integrity.
3) Placing of copings to central Implants and Distal Bar to distal Implants.
4) Proof of inferior prosthesis wearing (centered occlusion position, no interference on copings).
5) Placement of rubber dam over copings to protect soft tissues.
6) Applying selfpolymerizing acrylic resin on copings.
7) Applying acrylic resin between copings.
8) Applying to worn area in lower prosthesis, repositioning inside mouth, patient in occlusion until total polymerization.
9) Removal of inferior prosthesis after resin is polymerized, copings already captured.
10) Wearing, finishing and polishing of inferior prosthesis with polishing protectors.
11) Provisional implant supported prosthesis completed.
12) Final posterior inside-mouth view.