Stable prostheses for immediate and delayed restoration: The SynCone® Concept

ANKYLOS® SynCone® C/5° abutments provide a fast and economical restoration of the edentulous mandible with an immediately loaded prosthesis on four prefabricated interforaminal tapered abutments. For delayed restoration ANKYLOS® SynCone® C/5° serves as a prefabricated retaining element for prostheses in the mandible and maxilla.

The advantages:

- Patient-friendly immediate loading concept – Surgical procedure and prosthetic restoration in approximately two hours, during the anesthetic phase
- Stable and immovable fixation of prosthesis – Fixed by prefabricated tapered crowns, tension-free fit by intraoral bonding of the prosthesis to the caps
- Prosthesis with the comfort of a bridge – Maximum possible reduction of the prosthesis body and optimum hygiene capability
- Perfect preservation of hard and soft tissue – ANKYLOS® TissueCare concept for long-term stability
- Highly economical – Standardized protocol with prefabricated components for reduced laboratory expenditures and moderate overall costs.

Please read this manual carefully prior to using the system for the first time and follow the instructions and notes given in the instructions for use for the system components and instruments under all circumstances.

Prior to using a new implant system for the first time we also recommend all users to attend system-specific training.
**ANKYLOS® SynCone® C/**

**The tapered crown principle**

For many years the taper principle has proven its clinical benefits in the field of implant-abutment connections. ANKYLOS® SynCone® also facilitates the benefits of this concept for anchoring implant-supported prostheses. Compared to ready-for-use bars or other retaining elements, the SynCone® prosthesis is fixed by friction via a friction-locked and virtually gap-free connection of prefabricated tapered crowns and copings, giving an extremely stable fit without any micromovement. Intracoronal integration of the copings to the prosthesis provides a tension-free fit. Thus SynCone® provides the greatest possible reduction in prosthetic body and offers a removable restoration with the comfort of a fixed bridge.

The insertion of a prosthesis fixed on the prosthesis, which makes removal during the entire removal process of the telescopic crown generates friction and can be removed easily.

In contrast, a parallel-walled abutments (right) in comparison with taper concept). ANKYLOS® SynCone® abutments feature an internal freely movable straining screw which allows the taper of the abutment head (1) to be rotated in the connection taper of the implant (2) until a common direction of insertion is achieved for all abutments of the prosthesis.

**Patient benefits**

The tapered crown principle turns the prosthesis into a removable bridge with:
- Very high stability
- High chewing comfort
- Reduced prosthetic base
- Improved phonetics
- Optimal hygienic capability

In prosthetic dentistry, the tapered connection is a retaining element where the secondary crown is retained on the tapered primary crown via surface contact. Once retention has been breached, the prosthesis is freed immediately and can be removed easily.

Therefore, a parallel-walled telescopic crown generates friction during the entire removal process of the prosthesis, which makes removal noticeably more complicated. The insertion of a prosthesis fixed on tapered crowns is easier for the patient, as the lower diameter of the secondary crown is always greater than the upper diameter of the primary crown.

**The synergy of the two taper connections**

The prefabricated tapered crown can only function with tapered implant-abutment connection geometry, as the angled abutments only allow adjustment by rotating in the direction of insertion (staggered taper concept). ANKYLOS® SynCone® abutments are locked and virtually gap-free connection of prefabricated connections.

**Overdentures on ANKYLOS® SynCone® C/**

ANKYLOS® SynCone® C/ abutments made of titanium alloy Ti6Al4V provide a fast and economical restoration of the edentulous mandible with an immediately loaded prosthesis on four prefabricated interforaminal tapered abutments. Minimally invasive treatment allows delivery of the prosthesis even during anesthesia. Within the context of delayed restoration, ANKYLOS® SynCone® C/ 5° serves as a prefabricated retaining element for prostheses with four implants in the mandible and six implants in the maxilla. The prosthesis is fabricated in the laboratory. Intraoral bonding of the components provides the prosthesis with a tension-free fit (passive fit).
Step-by-step: Immediate restoration with ANKYLOS® SynCone® C/

The form of therapy in the edentulous mandible described in the following with immediately loaded ANKYLOS® implants requires the interforaminal insertion of four implants with a minimum length of 11 mm (14 mm are optimal) and the use of SynCone® abutments with 5° (optional 4°) taper.

A prerequisite for the successful application of the ANKYLOS® SynCone® concept is a prosthesis with optimal fit and occlusion as well as the parallel axial alignment of the SynCone® abutments.

The implants can be inserted either conventionally or as part of Guided Surgery. Computer-guided planning and template-guided insertion of the implants increase the precision of the parallel axial alignment of the implants later on.

Both protocols are described in the following pages. Please refer to the ANKYLOS® Surgical Manual, Order No. 6-251054, for detailed instructions on the placement of implants.

Please note:
Unless described otherwise, all drills are used in clockwise rotation. Cutting instruments need to be replaced after 20-fold use at the latest. Blunt or damaged instruments are to be replaced immediately. During preparation, ensure that the drills and milling tools have sufficient internal and external irrigation. A sufficient flow rate is assured, if the sources for internal and external irrigation are separate.
Please note:
Bone chips can block the opening of the internal irrigation during preparation. Especially when preparing several cavities in sequence, it is recommended to check the drill for uninterrupted flow outside the patient’s mouth from time to time. Gentle and thorough disinfection and cleaning of the drills will ensure their optimal functioning. Please observe the directions in the cleaning instructions.

Marking implant position
The drill guide is placed and the implant position transferred to the bone using the twist drill (Lindemann drill optional). The titanium sleeve for drill guides (order no. 3104 5490) can only be used in conjunction with the twist drill.

Pilot hole with twist drill
After removing the drill guide, the twist drill is used to determine the direction of the implant. Depending on the ridge profile, the axial direction can deviate within limits from that specified by the implant template. Any axial divergence can be compensated later with angled abutments.

Depth drilling
Depth drilling is performed with Tri-Spade drills. The upper edges of the ring markings correspond to the implant lengths. The Tri-Spade drill A is always used first. When using B, C or D implants, the hole is consecutively widened using the Tri-Spade drills B, C or the parallel drill D. In case of increased bone density care should be taken to proceed atraumatically and with slight pressure.

Manual use of reamer
The reamer and ratchet insert for instruments are joined to the required length and inserted into the ratchet, whereby the arrow on the switch button of the ratchet faces in the direction of rotation. The pin on the open end wrench acts as a guide to prevent any tilting of the instruments. The conical reamer is guided into the cavity and preparation commences without applying pressure. Only during the final quarter can preparation be supported by applying slight pressure. The non-cutting tip prevents and deepening of the hole. Prior to removal the reamer rotated by a single revolution counterclockwise.

Manual use of the tap
The tap corresponding to the implant diameter is joined to the ratchet insert for instruments in the required length and inserted into the ratchet. The tap is used as described opposite.

Screwing in implant manually
The implant driver of the desired length is fitted with the screw handle of the ratchet insert to remove the implant from the implant shuttle. The implant is screwed into the jaw bone for about two thirds of its length. Make sure that no fibrous or epithelial tissue is transferred to the implant site. Final positioning is performed with the ratchet.

If preparation and insertion by machine are preferred for exact torque control, please follow the instruction in the ANKYLOS® Surgical Manual.

Primary stability
For planned immediate function, the torque should be at least 35 Ncm to provide sufficient primary stability. For better tactile control of the screwing resistance we recommend manual bone preparation and insertion of the implant using a torque-controlled ratchet.

If sufficient primary stability cannot be achieved, immediate loading is not recommended. In this case the implants are sealed with cover screws for submerged healing. Prosthetic restoration is then performed as part of delayed restoration as described from page 18.
Step-by-step: Preparation of the implant site with Guided Surgery

Planning and drill guide
Implantation is planned using the 3D scan and ExpertEase™ software. An individual ExpertEase™ drill guide is then prepared from the digital planning data via a stereolithography.

This ensures the fully and accurately transfer of planning to the patient's mouth.

Surgical procedure
The following step-by-step instructions describe the template-guided preparation of the implant site with insertion of the implants without open flaps of the mucosa (flapless surgery).

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Scan template / scan
With the 3D scan of the patient and the scan template via CT (computer tomography) or DVT (digital volume tomography), the ExpertEase™ Software not only displays the patient's jaws, but also the planned arrangement of teeth as a 3D model.

3D planning
With ExpertEase™ Software all relevant information for implantation can be determined for any area of the jaw and the implant position and size planned accurately and secure.

flapless surgery
As ExpertEase™ allows accurate planning of the implementation with a display of the anatomical structures, minimal invasive flapless surgery is, of course, possible with adequate bone volume and sufficient keratinized gingiva. A mucosa-supported drill guide is used for this purpose.

Drill guide
The appropriate drill guide is ordered for the planned restoration procedure of the edentulous mandible.

flap surgery
If the bone is to be uncovered for implantation purposes, a bone-supported drill guide is used. This provides an optimal, genuine fit on the jaw bone.

Fixing the template
The mucosa-supported ExpertEase™ drill guide is placed in the patient's mouth and checked for accurate and stable fit. The drill guide is then fixed vestibularly, if required also palatinally or lingually, at the intended positions on the jaw.

Punching of the mucosa
Using the ANKYLOS® mucosa punch GS, a minimal invasive circular incision is performed with the diameter of the implant to the coronal bone level.

Initial drilling
Using the ANKYLOS® starter drill GS, the mucosa, and if necessary, the bone, are removed coronally to the implant shoulder and the jaw bone punch-marked. The starter drill is guided directly in the template sleeve.
Pilot hole

The ANKYLOS® twist drill GS D 2.0 is the drill with the smallest diameter (2 mm) and is used for initial drilling. The pilot drill for the planned implant length is used together with a drill sleeve, and, like all drills, is fitted with a mechanical depth stop which ensures that the planned drilling depth is not exceeded.

Enlargement drilling

The ANKYLOS® Tri-Spade drills GS A and B are available for the implant lengths and diameters and serve the stepwise preparation of the implant site through to the planned implant diameter. The Tri-Spade drills are used according to the length of the planned implant.

Crestal enlargement

The ANKYLOS® conical reamer GS serves the conical enlargement of depth drilling in the crestal region and is guided directly in the guide sleeve.

Tapping

Following crestal preparation, the implant thread is pre-cut with the reamer, using the ANKYLOS® tap GS. In contrast to the previously used instruments, the tap is not fitted with a mechanical depth stop. The maximum depth for preparation is achieved once the guide shaft is flush with the top margin of the guide sleeve.

Screwing in of implant

The ANKYLOS® implant is inserted to the planned depth of insertion using the ANKYLOS® implant driver GS. The planned position of the implant is achieved once the cylindrical section of the implant driver is flush with the top margin of the guide sleeve.

Securing the drill guide

Prior to placing further implants the drill guide is secured against displacement using the stabilization abutment for placement heads. At least the first two implants must be prepared, placed and fitted with the stabilization abutment consecutively before placing further implants.

Please note:
Replace instruments in case of damage or loss of sharpness, after 20-fold use at the latest. Only use the twist drills with the corresponding drill sleeves. Use the drill sleeves for a maximum of 10 drilling procedures on the same patient. Dispose of all used drill sleeves immediately after completion of the surgical procedure, as the sleeves may stick to the drill and may possibly prove difficult or impossible to separate from the drill later on.

Please note:
A visual check of the tapping depth and implant placement must be observed under all circumstances. If screwed in too far, there is a risk of damage to anatomical structures and nerves.

Please note:
During preparation, ensure that the instruments have sufficient internal and external irrigation. A sufficient flow rate is assured, if the sources for internal and external irrigation are separate. Bone chips can block the opening of the internal irrigation during preparation. Especially when preparing several cavities in sequence, it is therefore recommended to check regularly for uninterrupted flow of coolant outside the guide.

All twist and Tri-Spade drills for implants A8–14 and B8–14 are available for the length of the implant (final length drills). Thus, the shortest possible drill can always be used in case of limited space.

SynCone® C/: Immediate restoration

All twist and Tri-Spade drills are guided accurately in the guide via the Sleeve-on-Drill™ System using a guide sleeve fixed to the instrument. All twist and Tri-Spade drills for implants A8–14 and B8–14 are available for the length of the implant (final length drills).

Please note:
During preparation, ensure that the instruments have sufficient internal and external irrigation. A sufficient flow rate is assured, if the sources for internal and external irrigation are separate. Bone chips can block the opening of the internal irrigation during preparation. Especially when preparing several cavities in sequence, it is therefore recommended to check regularly for uninterrupted flow of coolant outside the guide.
ANKYLOS® SynCone® C/: Immediate restoration

Step-by-step: Immediate restoration with existing prosthesis

The prosthesis is to be integrated chairside immediately after insertion of the ANKYLOS® implants and the SynCone® abutments. Laboratory-supported incorporation of the caps via impression making and model casting is not scheduled as part of immediate restoration.

To this purpose the placement heads are removed from the implants by loosening the straining screw of the head using the 1.0 mm/hex screwdriver. Then remove placement head from the mouth. Safeguard against swallowing or aspiration.

Selection and axial alignment of the abutments

Only SynCone® abutments with the same tapered angle may be used in a prosthesis. A prerequisite for the successful application of the SynCone® concept is the parallel axial alignment of the SynCone® abutments (Fig. above).

If the taper surfaces are parallel due to diverging SynCone® abutments, this can cancel taper retention and lead to increased retention (Fig. below).

Screwing in of ANKYLOS® SynCone® C/ abutments

The selection of SynCone® abutments with 5° tapered angle (optional 4°) depends on the thickness of the mucosa. Prior to placing the SynCone® C/ abutments ensure that the inner taper of the implants has been rinsed carefully and dried. The SynCone® C/ abutments are to be sterilized prior to placement.

The abutments are then screwed into the implants using the 1.0 mm hexagon screwdriver. The torque wrench with hex insert or a torque-controlled contra-angle handpiece serve this purpose.

The recommended torque for the straining screw is 15 Ncm.

Aligning the insertion direction of the abutments

For diverging implants, the direction of insertion can be adjusted using angled SynCone® abutments. Using SynCone® parallel gauges, the abutments are aligned axially parallel to each other (at least 1° taper over all surfaces).

The positioning key for angled standard abutments included in the prosthetic tray, which is fixed to the shaft of the gauges, can be used to screw in the abutments via the parallel gauges.

First screw in 7.5°-angled abutments with the 7 mm screw handle, then remove the parallel gauge and tighten straining screw with 15 Ncm.

Closing the screw channel, wound closure

In the case of straight SynCone® abutments with a 5° tapered angle, the hole of the screw channel is to be sealed with the cover screw for the SynCone® C/ abutment 5°. For angled abutments this is done with thermoplastics.

Then, close the wound edges saliva-tight by carefully suturing with monofilament suture material. The abutment geometry, with its convex sulcus section, allows tight peri-implant attachment of the mucosa, resulting in elevation of the wound edges in the irritation-protected transmucosal zone of the abutment. The clinical result after a short period is a well attached, fibrous wound edge.

Attaching ANKYLOS® tapered caps with retention

Sterilize the prefabricated Degulor® tapered caps with retention for SynCone® according to the instructions for use and place them firmly on the SynCone® abutments. The retention profile serves for attachment to the plastic base of the prosthesis. Caps without retention may not be incorporated into an existing prosthesis. Then pull the flexible SynCone® polymerization sleeve over the cap to below the abutment equator. This prevents any cold-cured polymer penetrating between cap and abutment or the sulcus region of the abutment and protects the soft tissue. Alternatively, a cofferdam curved incision can be carried out in the same manner.

Preparing the prosthesis

The prosthesis to be incorporated must match the available mandibular mucosal tegument and meet functional chewing and esthetic requirements.

The prosthesis must be ground sufficiently to avoid imperfections on the caps. It also serves as a drilling guide. At the same time grinding should be kept to a bare minimum to avoid excessive polymerization shrinkage. Extended functional margins can be shortened as far as possible.
Postoperative care with immediate loading

Instructions during healing – recommendations to the patient

- Wear the fixed prosthesis permanently for two weeks
- Take a soft diet for 14 days
- The patient should use an antibacterial mouth rinse after meals. This serves the prophylaxis of infections as the insertion points of the implants can at first not be cleaned manually.

Further procedure after healing

The prosthesis is removed from the oral cavity by the dentist after one week when the sutures are removed, and then worn again for one week. Following this two week period, the patient is given detailed instructions on further oral and prosthetic hygiene and on the handling of his mandibular dental prosthesis. After this period, a normal diet can be resumed.

As usual, regular follow-up examinations are necessary to compensate for any deficits on the edges of the prosthesis (no padding).

Long-term temporary denture

The solution with immediate restoration is to be regarded as a long-term temporary denture. After three to six months, the prosthesis is newly made with a metal reinforcement (see page 20 et seq.).
ANKYLOS® SynCone® C/: Delayed restoration

Step-by-step: Prosthesis on ANKYLOS® SynCone® C/ on osseointegrated implants

A metal-reinforced prosthesis is fabricated for the final restoration of the patient.

- As replacement for the long-term temporary denture after healing of the implants placed for immediate loading
- As part of the two-stage procedure after healing and uncovery of the implants

**After SynCone® immediate loading**
- Implant placement
- Placement of abutments
- Delivery of temporary prosthesis on SynCone® caps

**After three to six months**
- Transfer of abutment position with SynCone® caps

**SynCone® on osseointegrated implants**
- Implant placement
- Following submerged healing
  - Uncovery of the implants, insertion of sulcus former
  - Transfer of implant position with impression copings
    - Model casting with implant analogs
  - Selection and insertion SynCone® abutments, axial alignment
  - Fabrication of framework
    - Intraoral bonding
    - Total impression
    - New working model
    - Completion and delivery of the prosthesis
Uncovery of the implants and healing of the soft tissue

Uncovery of the implants and removal of the ANKYLOS® C/X cover screw is performed as described on page 28. ANKYLOS® C/X gingiva formers D 4.2 are used for contouring the soft tissue (sulcus formers Balance Posterior for tapered angles 4° and 6°). These are hand-tightened with the 1.0 mm hex screwdriver and remain in situ for approximately 14 days. Sterilize the gingiva formers prior to use.

The gingiva formers are removed for impression making and the connection taper cleaned of any residual tissue.

Impression PickUp technique (open tray)

The impression is made using the components of the ANKYLOS® Balance range and an open tray. Clean the connection taper of the implants of any residual tissue. Insert the transfer posts into the connection taper of the implants and attach with transfer screws of the desired length. Hand-tighten the transfer screws. The internal hex is only used here to loosen the screw. Ensure the fit of the transfer posts in the connection taper of the implants. If necessary, the transfer screws can be shortened and provided with a slot.

After curing of the impression material, undo the transfer screws and remove the impression with the abutment.

The impression with the transfer screws is sent to the dental laboratory for model casting with implant analogs.

Alternative: PickUp technique (closed tray)

If the implants intended for impression do not display any appreciable axial discrepancies, the transfer post can also be inserted using the repositioning technique as an alternative.

After curing of the impression compound, remove the impression and, if necessary, reposition the SynCone® caps. The impression with the caps is sent to the dental laboratory for model casting.

During the laboratory phase, the patient continues to wear the remodeled immediate loading prosthesis. After fabrication of the final prosthesis the patient can also use this as a replacement.

Following submerged healing

Uncovery of the implants and healing of the soft tissue

Uncovery of the implants and removal of the ANKYLOS® C/X cover screw is performed as described on page 28. ANKYLOS® C/X gingiva formers D 4.2 are used for contouring the soft tissue (sulcus formers Balance Posterior for tapered angles 4° and 6°). These are hand-tightened with the 1.0 mm hex screwdriver and remain in situ for approximately 14 days. Sterilize the gingiva formers prior to use.

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After curing of the impression compound, undo the transfer screws and remove the impression with the abutment.

The impression with the transfer screws is sent to the dental laboratory for model casting with implant analogs.

Simplified impression after immediate loading

Following immediate loading, simplified impression making is possible directly via the already placed ANKYLOS® SynCone® abutments.

First, the SynCone® abutments are measured with a parallelometer using a plaster cast fabricated with an alginate impression. Here it should be ensured that the SynCone® abutments do not display any parallel surfaces, especially divergences. If this is the case, impressions of the implants should be remade on the healed implants according to the protocol (page 16). The position of the SynCone® abutments is transferred to the dental laboratory by means of the tapered caps for SynCone®.

For impression purposes, the caps are to be positioned loosely on the abutment. These caps are later integrated into the new prosthesis. The impression is made with a closed tray using silicone. After curing of the impression compound, remove the impression and, if necessary, reposition the SynCone® caps. The impression with the caps is sent to the dental laboratory for model casting.

During the laboratory phase, the patient continues to wear the remodeled immediate loading prosthesis. After fabrication of the final prosthesis the patient can also use this as a replacement.
Step-by-step: Model casting

Fabrication of model after immediate loading

If the prosthesis is fabricated from the old prosthesis as replacement for the long-term temporary denture after healing of the immediately loaded implants, simplified impression with SynCone® caps is possible directly via the already existing ANKYLOS® SynCone® abutments of the patient. The prerequisite for this, however, is that the SynCone® abutments do not present any divergences or resulting parallel surfaces.

Check SynCone® abutments

After model casting, the replicas of the SynCone® abutments are measured with a parallelometer using a plaster cast made from alginate impression to ensure a common direction of insertion. Here it is to be insured that the abutments do not display any divergences or resulting parallel surfaces. After immediate loading or simplified impression via the SynCone® caps, the selection and attachment of the abutments given on pages 24-25 is omitted. The plastic stumps created during the fabrication of the model serve as placeholders for the abutments in the model.

Model casting following submerged healing

If a prosthesis is fabricated following submerged healing, the components of the ANKYLOS® Balance C/X prosthetic range, that is, the PickUp (open tray) or repositioning transfer abutments are used for the impression. These are fixed in the ANKYLOS® Balance C/ implant analog.

AN KYLOS® Balance C/
fixing of implant analog

Screw the implant analogs to the transfer abutments fixed in the impression using the transfer screws.

Mucosa mask

Insulate the impression with silicone lubricant prior to casting and coat the area surrounding the implant analogs with gingiva casting material. Observe the manufacturer’s instructions for use.

Model casting

Fabricate the model using dental stone Class IV. Ensure sufficient height to cover the lower part of the implant analog with plaster. Then, undo the transfer screw and remove the impression. Now the prosthetic abutments can be selected.

Please note:
In the case of divergences and the resulting parallel tapered surfaces, a new impression is taken using ANKYLOS® Balance C/X components according to the protocol for submerged healing.

Please note:
If the sulcus former is smaller than the abutment to be selected, the gingival mask may impair the fit. In this case, fit the gingival mask after selecting the abutment.

After immediate loading

Model casting

To fabricate the model, insulate the inner face of the ANKYLOS® tapered caps for SynCone® if necessary, fill with self-curing liquid plastic and fit a dowel pin. Then fill the impression with dental stone.

Check SynCone® abutments

After model casting, the replicas of the SynCone® abutments are measured with a parallelometer using a plaster cast made from alginate impression to ensure a common direction of insertion.

AN KYLOS® Balance C/
fixing of implant analog

Screw the implant analogs to the transfer abutments fixed in the impression using the transfer screws.

Mucosa mask

Insulate the impression with silicone lubricant prior to casting and coat the area surrounding the implant analogs with gingiva casting material. Observe the manufacturer’s instructions for use.

Model casting

Fabricate the model using dental stone Class IV. Ensure sufficient height to cover the lower part of the implant analog with plaster. Then, undo the transfer screw and remove the impression. Now the prosthetic abutments can be selected.

Please note:
In the case of divergences and the resulting parallel tapered surfaces, a new impression is taken using ANKYLOS® Balance C/X components according to the protocol for submerged healing.

Please note:
If the sulcus former is smaller than the abutment to be selected, the gingival mask may impair the fit. In this case, fit the gingival mask after selecting the abutment.
Selection of prosthetic abutments

Select the ANKYLOS® SynCone® abutments according to sulcus height and the angulation necessary to compensate for the axial divergence of the implants. The equator of the abutments should lie slightly supragingival. Screw retain straight abutments directly using the 1.0 mm hex laboratory screwdriver; insert angled abutments only into the implant analog.

Parallelization of abutments

Place the parallelization gauge on all abutments. For angled abutments, the parallelization gauge is to be placed such that the channel for the central straining screw can be accessed via the window. Adjust the angled abutments to a common parallel direction of insertion in the parallelemeter. Here, the positioning key for Standard angled abutments provided in the prosthetics kit, can be used as an aid for turning the abutments via the parallelization gauges. This can be attached to the shaft of the gauges.

First, screw in the 7.5°-angled abutments with the 7 mm screw handle, then remove the parallelization gauge and tighten the straining screw with 10 Ncm using the laboratory screwdriver. For straight SynCone® abutments with a 5° tapered angle, the screw channel hole can be sealed with the cover screw for SynCone® C/5° abutments in the patient’s mouth. For angled abutments, self-curing thermoplastics are used for this purpose.

Marking the abutments

SynCone® 5° abutments are grooved at the occlusal margin to hold these securely in the transfer key. To avoid misidentification, further small grooves can be added individually to the occlusal margin.

Transfer key

Once the abutments have been aligned, attached and grooved, a transfer key is fabricated. This can be fabricated entirely from quick-curing synthetic material and, if necessary, provided with a metal reinforcement, which is adapted using synthetic material.
Attaching ANKYLOS® tapered caps for SynCone®

Place the Degulor® tapered caps without retention on the abutments and cover with a 0.2 mm thick layer of wax as a placeholder. When using tapered caps with retention, the retention section of the caps should be ground off beforehand. All undercut sections should be blocked for preparation of the duplicate model for making the cast.

Wax-up of metal framework

The metal reinforcement, represented in the illustration as an internal reinforcement, is waxed up on the investment model. A wax-up with matrix ensures the correct position of the metal framework, a rear cover plate can be fabricated as an option.

Ensure that the connections between the cap mountings and the retentions are stable. The framework must have a clearance of 1–2 mm to the basal mucosa and should be shorter than the caps.

Finishing the framework

After casting, devest and finish the framework. Small windows for checking the fit of the caps are placed in the occlusal edge of the caps. These allow the adhesive to escape easier during later bonding in the mouth.

Check stability and fit

The stability of the metal framework is checked by applying pressure on both sides of the saddles. These should not bend under pressure. The finished metal reinforcement in the model is checked for a contact-free fit on the caps. To this purpose, the caps are placed gently on the stumps and must not come off when the framework is removed.

The metal framework is bonded to the tapered caps directly in the patient’s mouth to provide an optimal, tension-free prosthetic fit (passive fit). To this end, the dental laboratory will make the following preparations.

Roughen the tapered caps and, if necessary, loosen the prosthetic abutments

The exterior of the tapered caps is roughened by abrasive blasting with aluminum oxide in preparation for intraoral bonding. The caps and the framework are sent to the dental surgeon.

If the ANKYLOS® SynCone® abutments are selected in the dental laboratory, remove these from the model using the transfer key and also send them to the dental surgeon.
Screwing in of ANKYLOS® SynCone® C/ abutments

Ensure that the inner taper of the implant has been thoroughly rinsed and dried prior to incorporating the SynCone® C/ abutments selected in the dental laboratory. The SynCone® C/ abutments should be sterilized prior to incorporation. The abutments are then screwed into the implants with the 1.0 mm hexagon screwdriver with the aid of the transfer key prepared in the dental laboratory. The torque-wrench with hex insert or a torque-controlled contra-angle handpiece serve this purpose. The recommended torque for the straining screw is 15 Ncm.

Preparing SynCone® caps for bonding

Place the caps on the abutments applying firm pressure. The outer surfaces of the caps were roughened in the dental laboratory by abrasive blasting with aluminum oxide in preparation for bonding, and are cleaned again with alcohol immediately prior to bonding.

Preparing the framework for bonding

The framework is to be checked for a movement- and tension-free fit as well as for clearance from the basal mucosa. The framework in the cap area should be shorter than the cap margins.

Bonding framework to caps

Coat the framework with metal adhesive for intraoral use, press onto the caps as for cementing a bridge and allow the adhesive to cure. Remove excess adhesive prior to hardening, particularly in the undercut areas. Remove the framework with the caps and remove any excess adhesive. After bonding, the framework must not rock and should fit tension-free (passive fit). The procedure should be repeated if this is not the case.

Bite registration

The framework is fitted with a synthetic wall after bonding and the bite registration is taken.

Overall impression for fabricating the prosthesis

Following bite registration, an unpressurized impression is taken by coating the framework. It is imperative that a plastic tray is used for this process. The impression is sent to the dental laboratory where the metal reinforced prosthesis is then completed. If an existing prosthesis is worn as a temporary denture during this period, this should be ground out, if necessary, in the region of the abutments now remaining in the patient's mouth and adjusted to the changed situation with non-hardening lining material (not in the case of preceding immediate loading).
Model casting
The dental laboratory creates a model from the overall impression sent by the dental practice, showing the exact position of the intraorally bonded metal framework in the patient’s mouth.

Dividing the tray
The tray must not be removed as usual after the plaster has hardened, as this may cause the framework to bend. Instead, the synthetic tray is divided into segments and the impression is removed from the model and framework in sections.

Opaquing the framework
Pink opaquer is applied to the framework to complete the prosthesis.

Completing the prosthesis
Position the teeth and after fitting, finish the prosthesis with cold-cure resin. The prosthesis cannot be finished with hot-cure resin due to temperature development and the changes in position of the caps this may cause.
After completion, inspect the interior of the coping for any excess synthetic sprue. This is removed if present.
Since the prosthesis is now mounted purely on implants, the edges of the prosthesis are trimmed as far as possible.

Delivery of the prosthesis
The prosthesis is delivered according to the principles of complete dentures. Any premature contacts should be corrected. The edges of the prosthesis can be shortened as much as possible; maxillary prostheses can be designed without a palate.
The finished prosthesis is sent to the dental practice for delivery on the ANKYLOS® SynCone® abutments already located in the patient’s mouth.

The SynCone® abutments always remain in the patient’s mouth. The existing prosthesis should be ground out in the area of the abutments now remaining in the patient’s mouth and adapted to the altered situation using non-hardening relining material.
ANKYLOS® SynCone® C/: System components

Components and instruments

The abutments for the ANKYLOS® SynCone® treatment concept are only available with non-indexed tapered connecting geometry, as free positioning of the abutments is essential.

All ANKYLOS® SynCone® C/ components are laser-marked with a “C/” as in “C”onus according to their possible use.

Prosthetic restoration

ANKYLOS® SynCone® C/ abutment
- For the restoration of the edentulous mandible with an immediate or delayed loaded prosthesis on four prefabricated interforaminal tapered abutments
- For the restoration of the edentulous maxilla on six osseointegrated implants
- Abutments with 5° tapered angles, adaptable to the clinical situation via three gingival heights (1.5/3.0/4.5 mm) and five angulations (0°, 7.5°, 15°, 22.5° and 30°).
- Optionally available with 4° and 6° tapered angles
- Cover screw for straight 5° abutments must be ordered separately

ANKYLOS® tapered cap Degulor® for SynCone®
- Caps with retention for secure attachment of an existing prosthesis to SynCone® abutments
- Caps without retention for bonding to the metal base of a newly fabricated prosthesis (in delayed restoration, only for 5° abutment)
- Alloy with high gold content Degulor® 3406

ANKYLOS® SynCone® C/ abutment 5°, straight and angled, cover screw for straight design

Dimensions ANKYLOS® SynCone® C/ abutment

Gingival heights

Polymerization sleeve for ANKYLOS® SynCone®, tapered cap for ANKYLOS® SynCone® with and without retention

Polymerization sleeve for ANKYLOS® SynCone®
- Prevents the polymerizate from entering the peri-implant sulcus region during polymerization of the caps into an existing prosthesis chairside
### ANKYLOS® SynCone® C/: System components

#### Model casting
- ANKYLOS® Balance C/ implant analog
  - For fixation of the prosthetic components in the master cast
  - Surgical steel DIN 1.4305

#### Instrument set
- **ANKYLOS® ATP punch**
  - Minimally invasive option for uncovering the surgical area as part of immediate restoration
  - For trepanation of the mucoperiosteum with a rotating punch sleeve followed by punch-marking of the alveolar ridge

- **Parallelization gauge for ANKYLOS® SynCone®**
  - For the parallel axial alignment of the SynCone® abutments
  - Available for all tapered angles
  - Connection for positioning key for SynCone® 5°

- **ANKYLOS® positioning key for angled standard abutments**
  - To facilitate rotation of the angled abutments via the parallelization gauges as part of the parallel alignment of the abutments
  - Included in the prosthetic kit

#### ANKYLOS® SynCone® C/ Components

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Item</th>
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<tbody>
<tr>
<td>3102 2110</td>
<td>ANKYLOS® SynCone® C/ abutment 5° tapered head 1.5° / 0° (straight)</td>
</tr>
<tr>
<td>3102 2120</td>
<td>3.0° / 0° (straight)</td>
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<tr>
<td>3102 2130</td>
<td>4.5° / 0° (straight)</td>
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<td>3102 2112</td>
<td>1.5° / 7.5°</td>
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<td>3102 2122</td>
<td>3.0° / 7.5°</td>
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<tr>
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<td>4.5° / 7.5°</td>
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<td>4.5° / 30°</td>
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<tr>
<td>3105 6280</td>
<td>ANKYLOS® cover screw for SynCone® C/ abutment straight 5°</td>
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</tbody>
</table>

Components with 4° and 6° tapered heads continue to remain available, see ANKYLOS® product catalog.

**Smartphone:**
Go to PDF of ANKYLOS® product catalog