AEON-SYSTEM

SURGICAL TECHNIQUE

PETER BREHM
Die Präzision in Titan
für den Menschen

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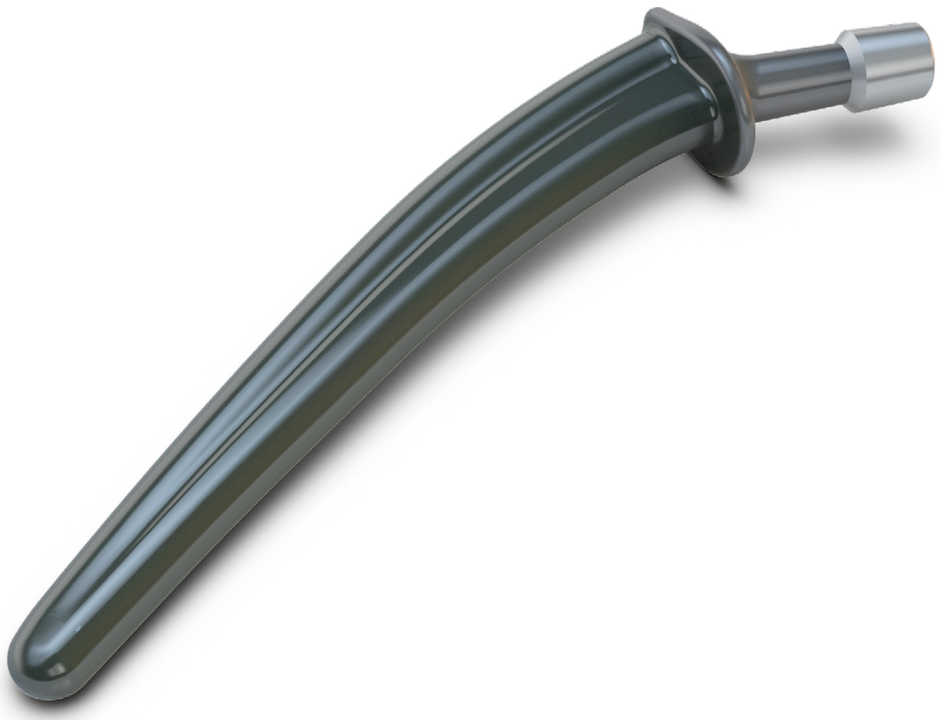


AEON-SYSTEM

Product Description

Implant Description

The AEON-System combines experience with innovation. With the AEON-System, an implant design has been created that incorporates proven features of familiar hip implantsystems. In addition the AEON-System offers a solution for the problem of metal incompatibility associated with CoCr implants.

The rounded contours of the implant design ensure a continuous cement mantle over the entire surface of the stem with partial filling of the intertrochanteric region. The stress-transferring structures of Shenton's line, the cortex of the femoral neck, and the calcar femorale are preserved. The hard cancellous bone adjacent to the cortex is filled with cement and reinforced. This reduces distal stress transfer and prevents proximal femoral lysis. The implant is available in five sizes and can be used in the right or left hip.

The osteotomy angle is 30°. The AEON stem is manufactured from the material TiAl6V4. The stem lengths between 130 and 160 mm have fixation surfaces that are relatively short yet provide sufficient support to allow using the implant in many different variants of femoral shaft anatomy. The implants stable cemented fixation concept and high rotational stability allow rapid mobilization and weight bearing.

IMPORTANT CHARACTERISTICS AT A GLANCE

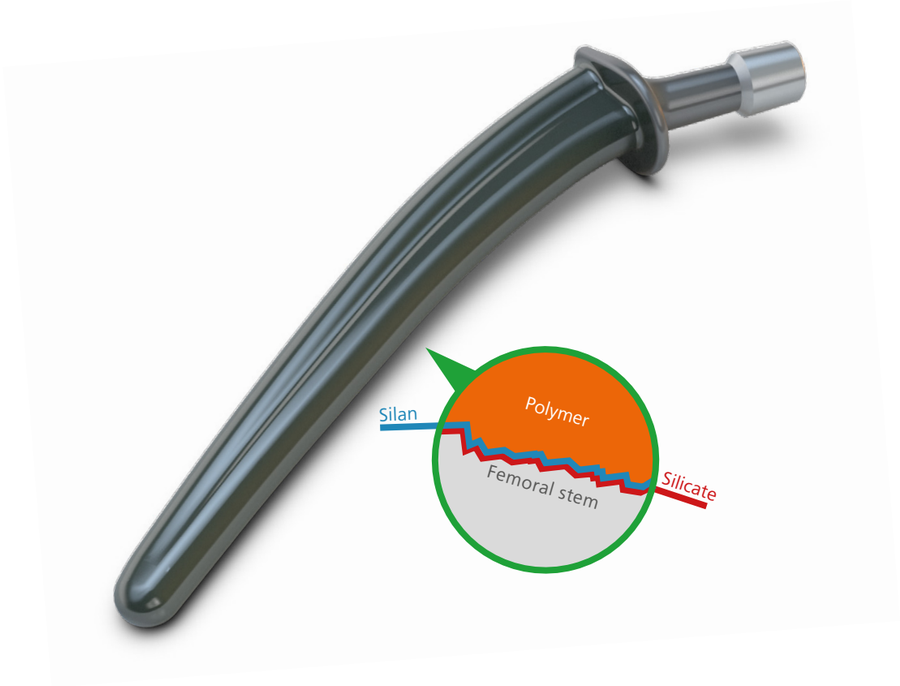
- The stress-transferring structures of Shenton's line, the cortex of the femoral neck, and the calcar femorale are preserved
- The tapered stem shape and implant collar provide stability against subsidence
- The tapered shape and rounded edges ensure harmonious stress transfer in the cement mantle
- The tapered stem shape and implant collar increase cement compression during implantation
- The flat hexagonal stem profile provides a high degree of rotational stability
- The physiologic, biomechanically ideal neck-stem angle of 138° ensures optimal stress transfer to the femur
- A broad collar guarantees optimal stress transfer
- A uniform cement mantle is present over the entire length of the implant
- The COVABOND coating on the AEON implant causes a chemical bond between stem and cement that resists hydrolysis

Product Description

COVABOND Surface Coating AEON-System

FOR ALL THOSE WHO WANT MORE

A distinctive feature of the AEON implant is its COVABOND silanated and silicated surface coating. Compared to uncoated cemented CoCr endoprostheses, this shows a significantly improved bond strength between cement and implant.



Instead of a mere mechanical interlock, the special coating causes a chemical bond between the implant and the bone cement. The net effect is a more stable implant fixation with a significantly reduced cement cracking. This also minimizes penetration of tissue fluids which can lead to hydrolytic degradation of the bond between bone cement and metal stem.

AEON-SYSTEM

Surgical Technique

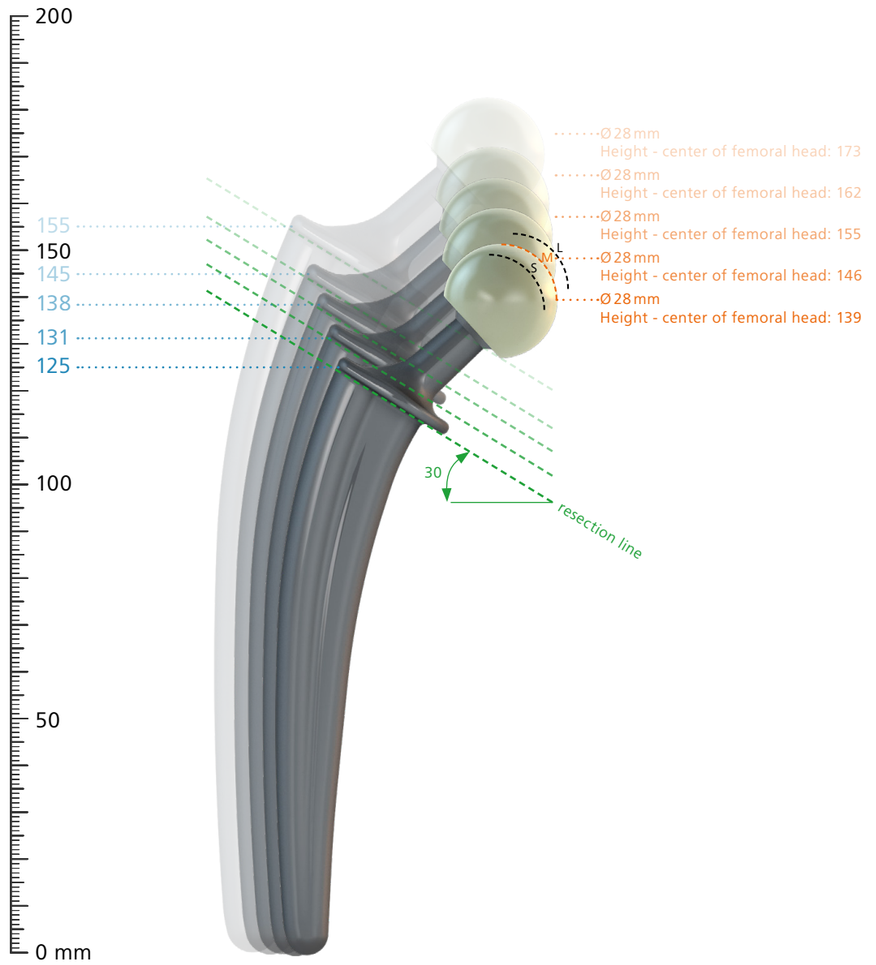
Preoperative Planning

The first step in preoperative planning is to determine the center of rotation of the affected hip. In the case of a severely deformed hip, a plain pelvis radiograph with the appropriate reference lines can aid the surgeon in determining the ideal center of rotation.

The center of rotation of the joint, the level of the resection, and the position of the stem within the femur are determined using templates on acetate sheets or by means of digital radiographic planning.

The final choice of stem size is always made intraoperatively. The largest deviations from the preoperative planning arise naturally by a curved proximal femur with a varus - and/or antecurvation.

> ! NOTE
>
> The correct selection of the implant (size, shape, composition, etc.) can reduce risks such as loosening.

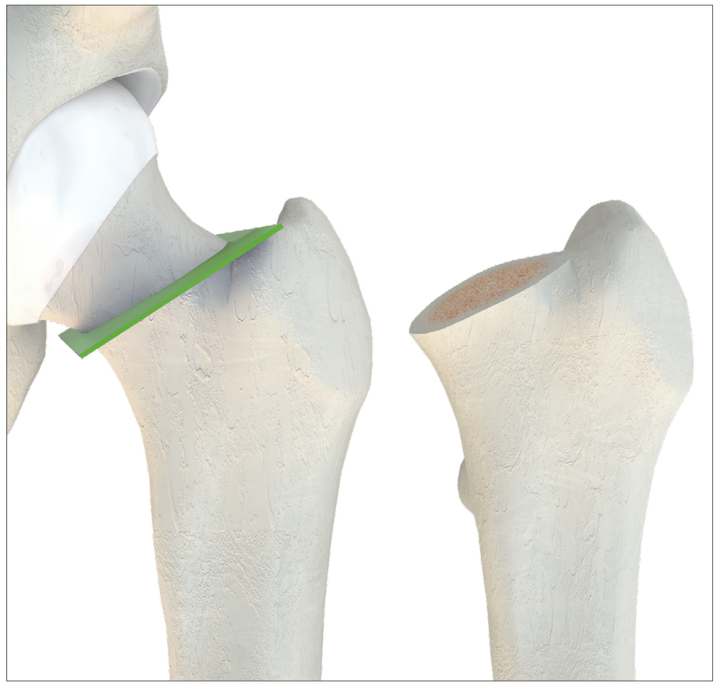


Preparing the Femur and Acetabulum

01

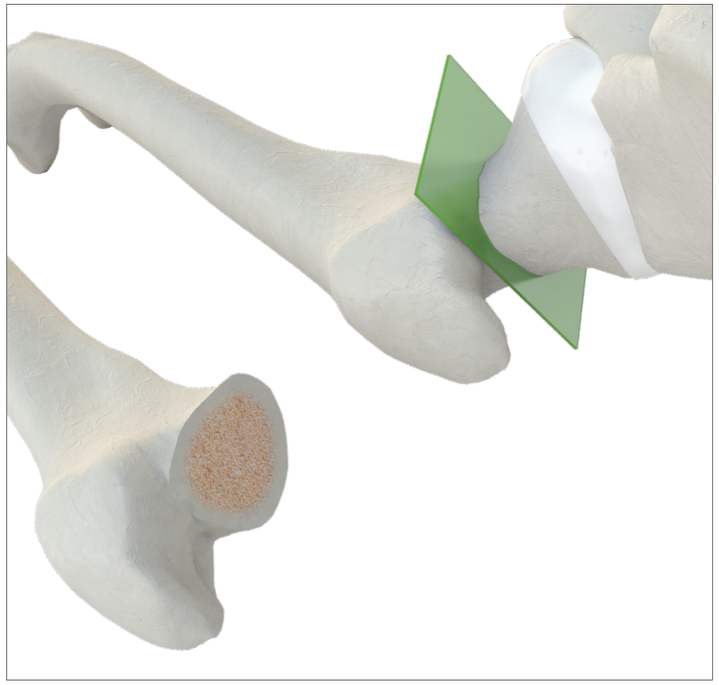
Resection of the Femoral Neck
With the hip either dislocated or still reduced, the osteotomy of the femoral neck is performed under the protection of Hohmann retractors with an oscillating saw.

The resection line on the femoral neck is determined according to preoperative planning. The measured values of preoperative planning can be used as references.



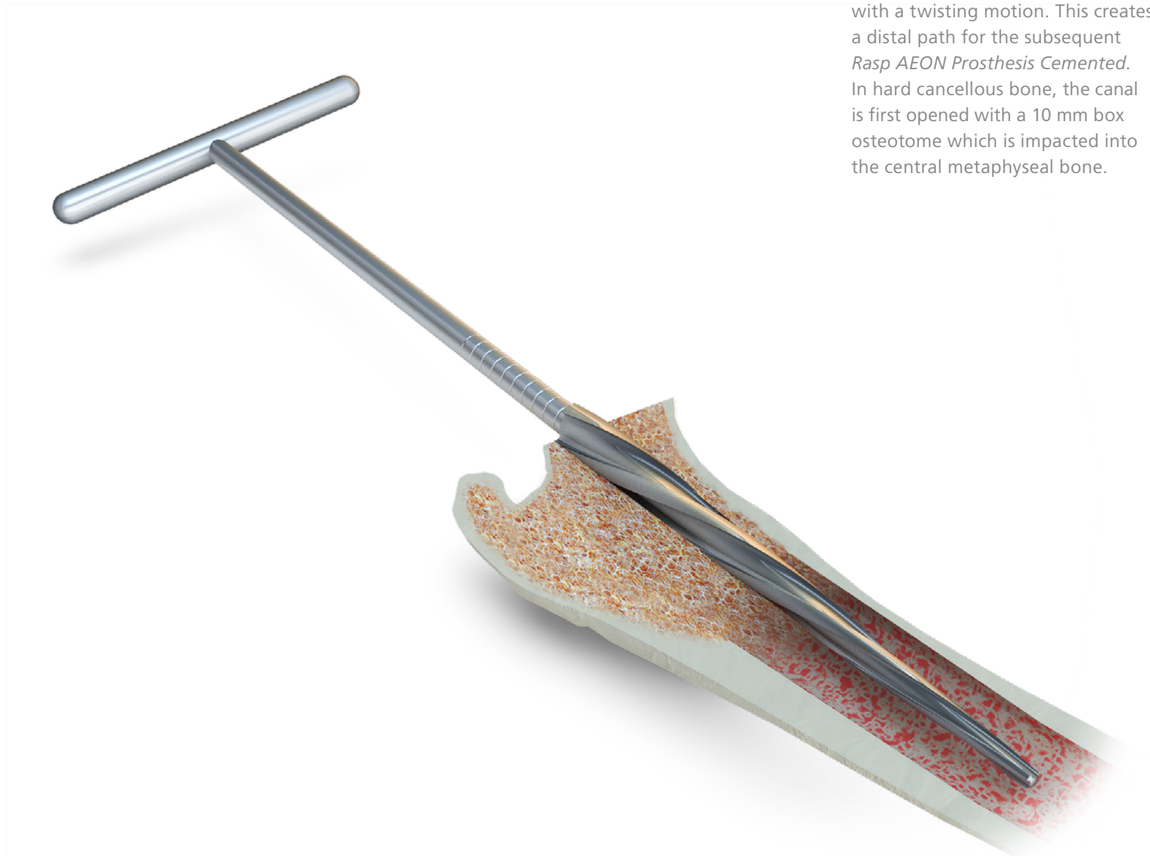
02

Implantation of the Acetabular Component
The preparation and implantation of the acetabular component must be prepared according to the implant manufacturer's instruction or the description of the surgical technique for the selected product.



03

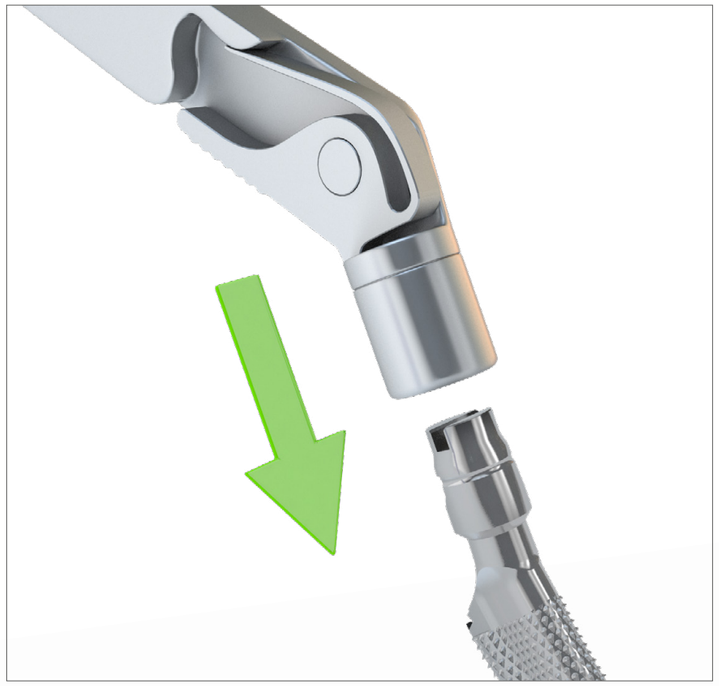
Opening the Femoral Canal
The femoral canal is opened with the sharp *Reamer.* The point of entry of the *Reamer* usually lies in the middle of the cancellous osteotomy surface of the femoral neck. This *Reamer* is then impacted axially, i. e. along the axis of the femoral shaft with a twisting motion. This creates a distal path for the subsequent *Rasp AEON Prosthesis Cemented.* In hard cancellous bone, the canal is first opened with a 10 mm box osteotome which is impacted into the central metaphyseal bone.

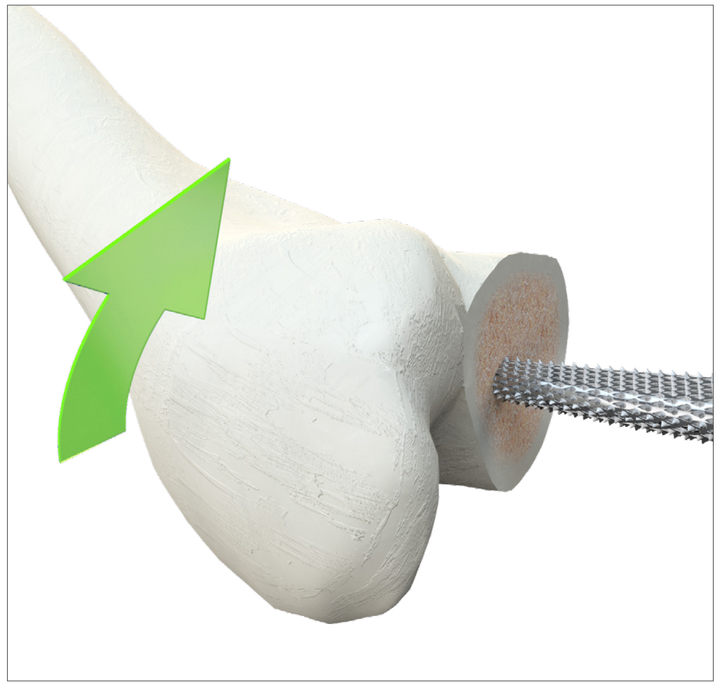


Preparing the Implant Bed

04

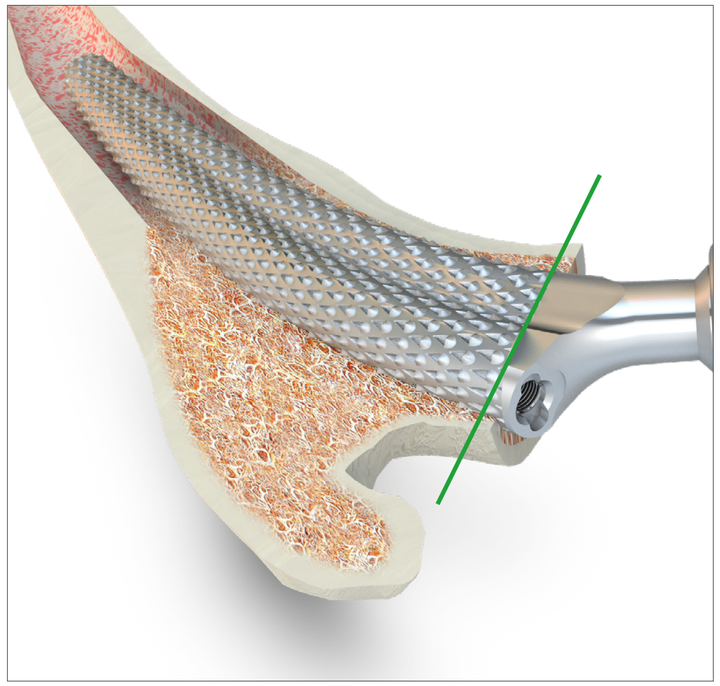
Preparing the Femoral Canal
The *Rasp AEON Prosthesis Cemented* is attached to the Handle for Rasp. Beginning with the smallest reamer size, the medullary canal is then enlarged.





05

The *Rasp AEON Prosthesis Cemented* is impacted into the cancellous bone by tapping it with a hammer. Take care to maintain the exact angle of implant anteversion, allowing for the position of the acetabular cup.



06

The surgeon sequentially increases the size of the *Rasp AEON Prosthesis Cemented* until the size determined in preoperative planning is reached. The last *Rasp AEON Prosthesis Cemented* must be impacted to the marking corresponding to the level of the osteotomy.

Rasp size = implant size

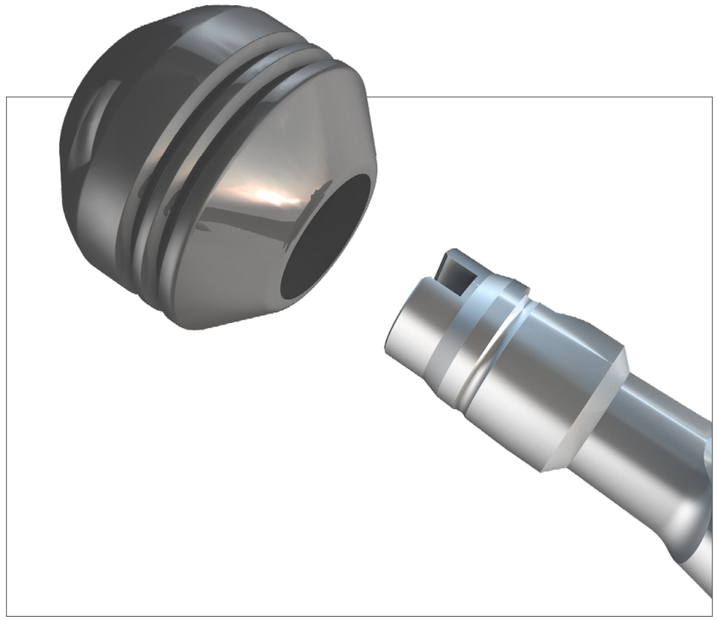
! NOTE

Cemented fixation requires the presence of cancellous bone.

Preparing the Implant Bed

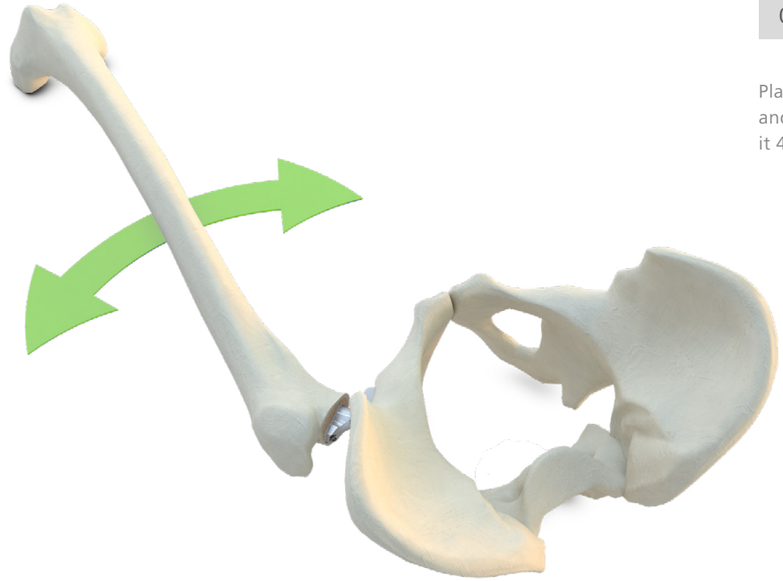
07

Attaching the TRIAL Head
The *Rasp AEON Prosthesis Cemented* also serves as a TRIAL Stem. The reamer handle is removed and a trial reduction is performed using a *TRIAL Head*. Range of motion, leg length, and soft-tissue tension are evaluated. There must be no impingement and no tendency to dislocate.

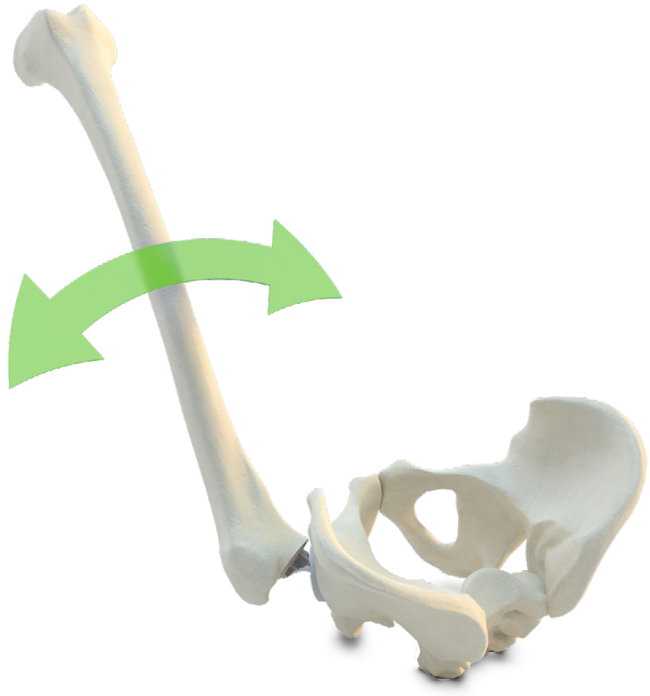


08

Place the hip in a neutral position and externally and internally rotate it 45°.



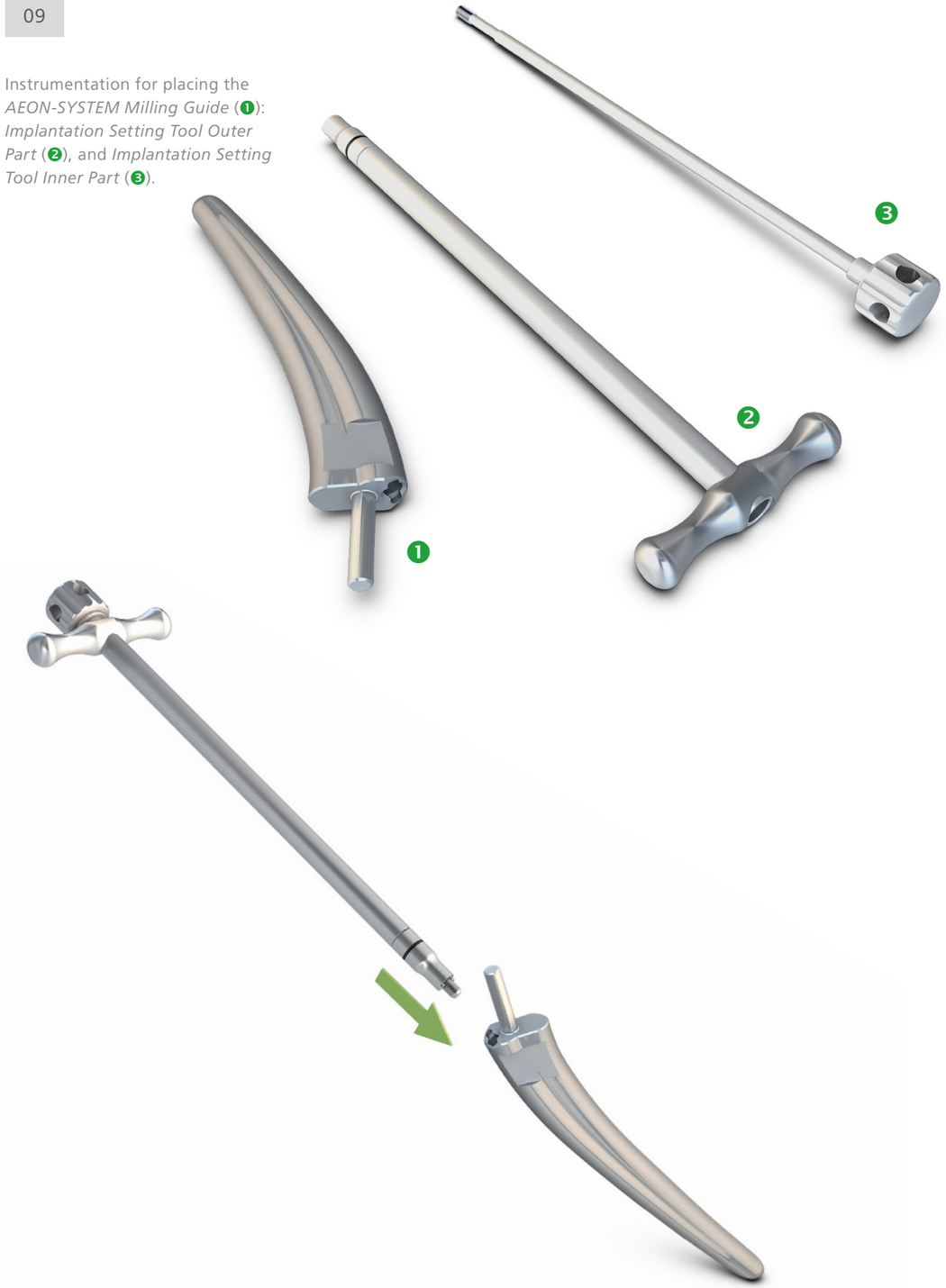
Flex the hip 90° and externally and internally rotate it 45°.

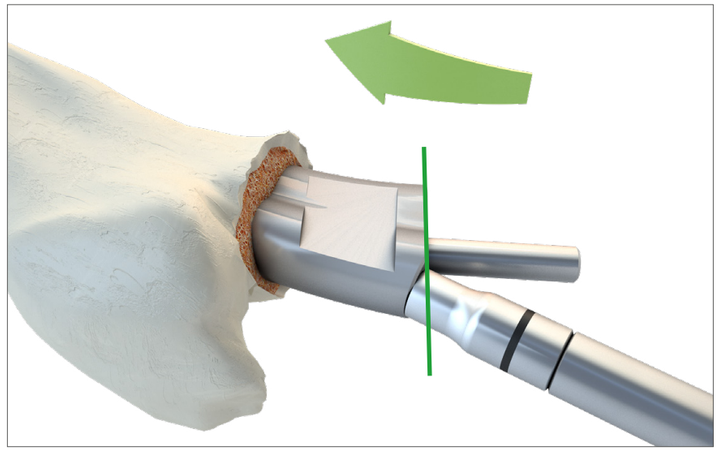


Preparing the Implant Bed

09

Instrumentation for placing the *AEON-SYSTEM Milling Guide* (❶): *Implantation Setting Tool Outer Part* (❷), and *Implantation Setting Tool Inner Part* (❸).





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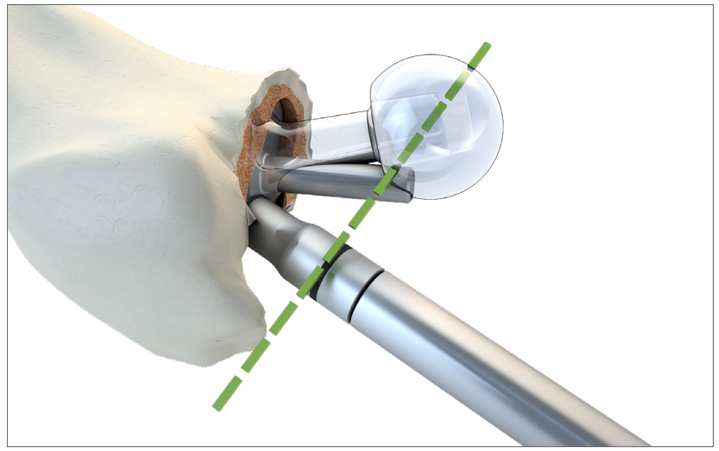
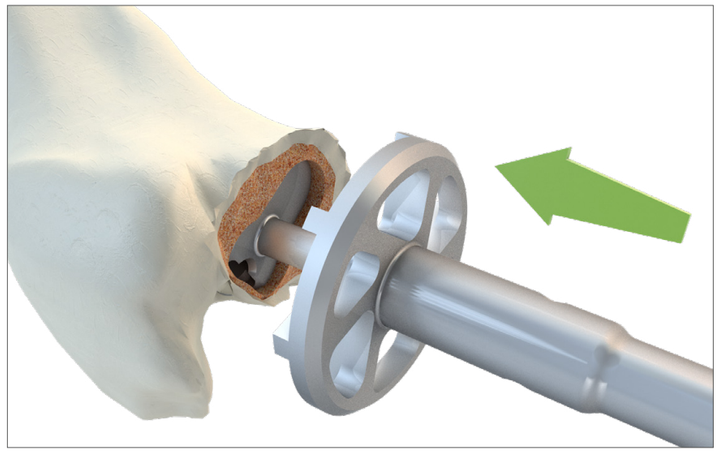
After trial reduction, the *Rasp AEON Prosthesis Cemented* is removed and the *AEON-SYSTEM Milling Guide* of the same size is inserted using the implantation setting tool.



! NOTE

Place the AEON system Milling Guide by hand only. Make sure that the mark of the Implantation Setting Tool is at the height of the previously determined centre of rotation (referencing the greater trochanter).



The *Calcar Reamer AO Coupling* is then inserted over the lug of the *AEON-System Milling Guide*. The level of the stop causes the tool to create a perfectly flat contact surface for the implant collar.

! NOTE

Do not forcibly press the Calcar Reamer AO Coupling onto the AEON-System Milling Guide.

Implanting the Stem

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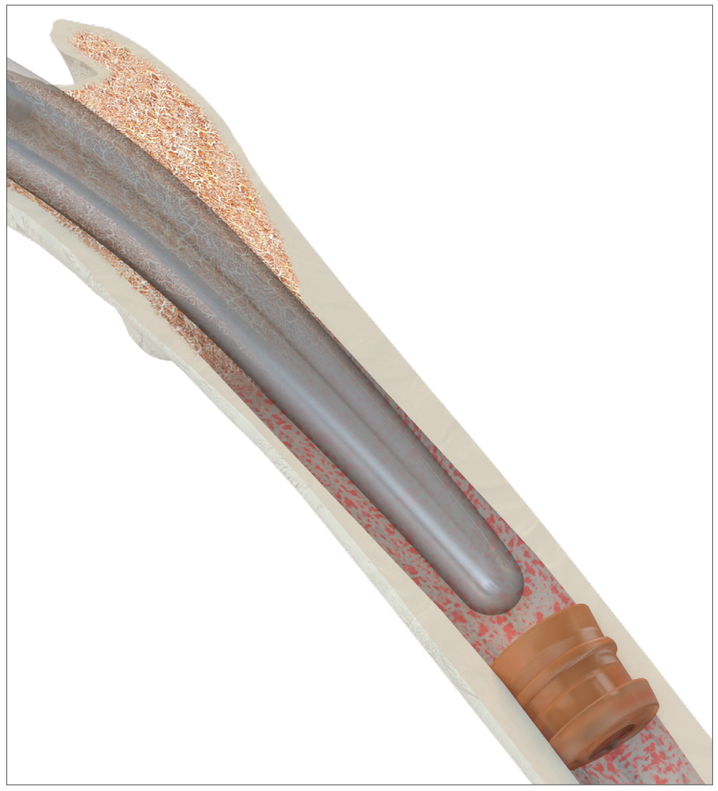
Placing the Cement Restrictor and Cleaning the Medullary Canal
The AEON-System does not provide standard instruments for placing cement restrictors. When third-party systems or the systems supplied by PETER BREHM GmbH are used it is important to compare the length of the impactor to the length of the AEON implant. The cement restrictor is placed about 20 mm distal to the tip of the implant. Next the femoral canal is carefully cleaned with suitable instruments, irrigation and suction to remove any residues from reaming such as blood or medullary fat. Then it is dried. The more thoroughly the cancellous surface is cleaned, the farther the bone cement can penetrate into the cancellous bone. Drying prevents formation of a parting layer of liquid between the cement and cancellous bone.



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Cement Application
The clinical result is greatly influenced by the way in which the cement (polymethyl methacrylate) is applied. Mixing the starting materials by machine results in significantly fewer bubbles than mixing by hand. In addition, consistent preparation is achieved in all operations and the risk of residual monomer concentration is reduced. It is essential to follow the instructions for use of the cement manufacturer strictly. After preparation of the bone cement, the femoral canal is filled in retrograde fashion from distal to proximal using a cement syringe with an appropriately long nozzle.

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Instrumentation for placing the *AEON-SYSTEM* implant (❶): *Implantation Setting Tool Outer Part* (❷), and *Implantation Setting Tool Inner Part* (❸).

! NOTE

- Place the definitive implant by hand only.
- Do not bring the surface into contact with materials that may leave residues (e.g. particles, lint).
- Do not bring the surface into contact with disinfectants and liquids (e.g. Ringer's solution), as these would damage the coating.
- Handle the implants only with clean surgical gloves, change surgical gloves if necessary and use new ones.

Rasp size = implant size

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The *Implantation Setting Tool Inner Part* is guided (turned) by the *Implantation Setting Tool Outer Part* and screwed into the implant.

Implanting the Stem

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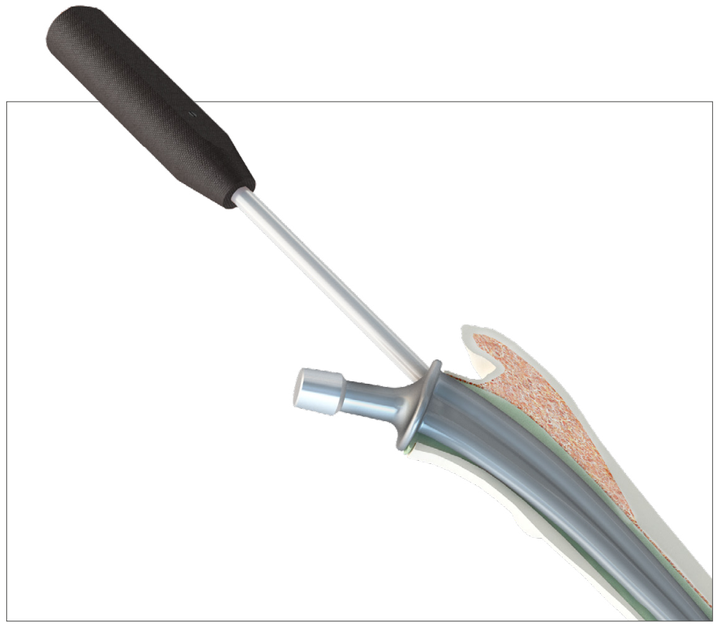
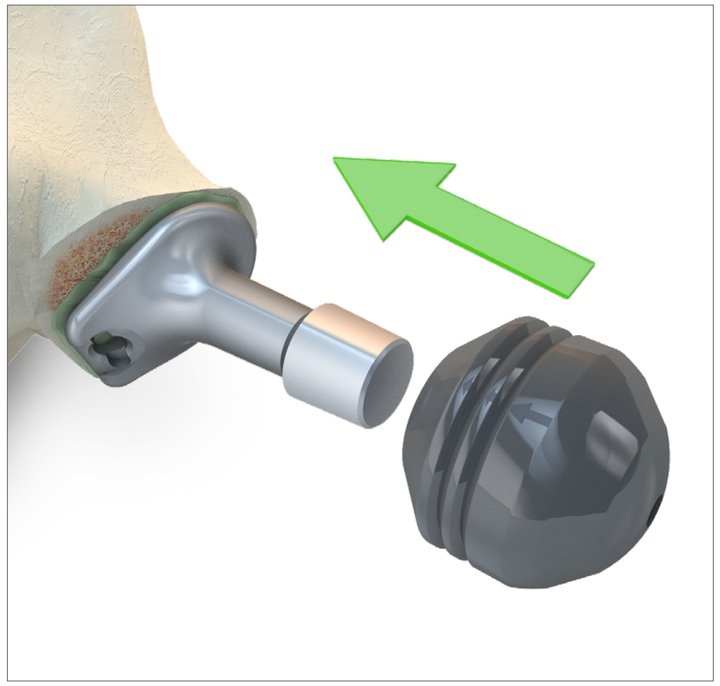
Placing the Definitive Implant
The selected *AEON-SYSTEM* implant is steadily inserted into the prepared canal by hand as far as it will go with the aid of the implantation setting tool or the *Impactor.*

! NOTE

The surface of the implant must be clean and dry as the presence of water molecules or residues reduces the adhesive force along the PMMA-implant interface.

The excess cement is removed. The implant is continuously cooled and held in position until the bone cement has hardened.





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Another trial reduction will facilitate the selection of the definitive implant head after the cement has hardened.

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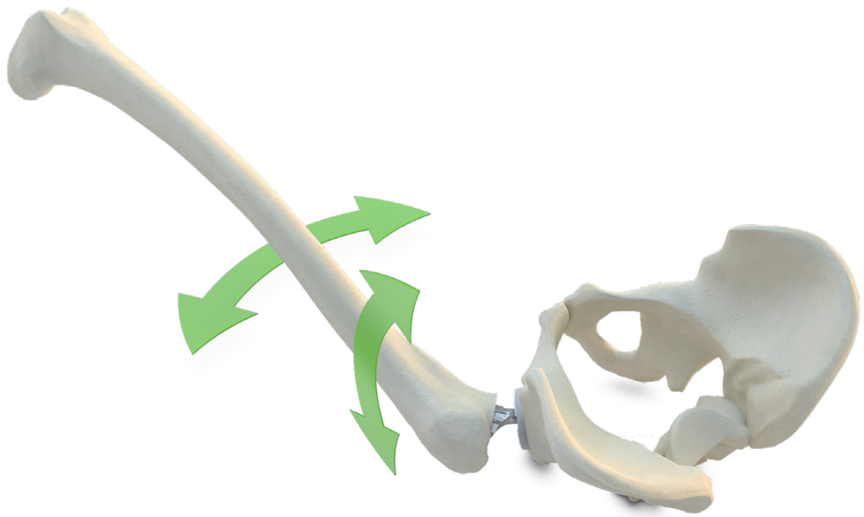
Repeated trial reduction



Implanting the Stem

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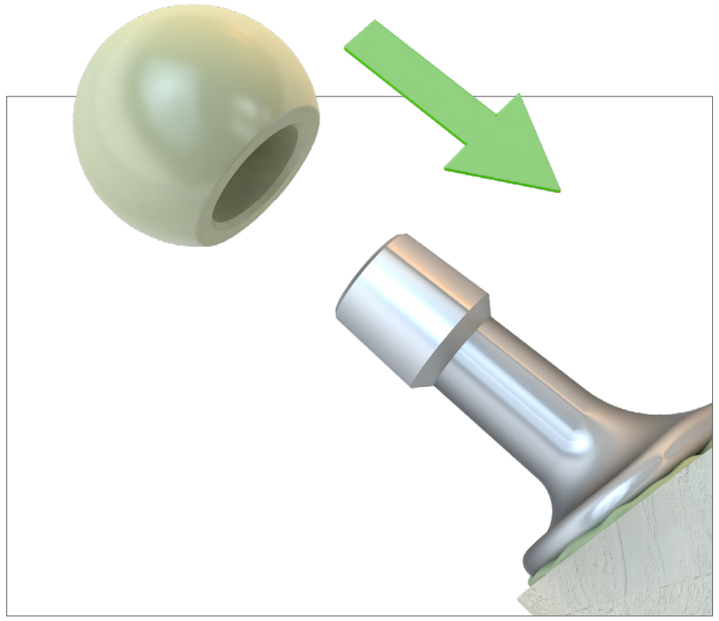
Attaching the Definitive Femoral Head

The stems of the AEON have a 12/14 taper (5° 40´). This taper can only be combined with femoral heads from PETER BREHM GmbH that have the same 12/14 inner taper. The taper is carefully cleaned and the selected femoral head is placed on the prosthesis neck taper using a twisting and sliding motion to fix it hand-tight.

! HINWEIS

Ensure that the inner taper of the femoral head matches the outer taper of the femoral stem



The femoral head is then locked to the stem taper by lightly tapping the Head Pusher axially with a hammer.

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The joint is then reduced, concluding the implantation procedure.

! NOTE

- Have to be combined with products released by PETER BREHM GmbH.
- It is essential to observe the instructions for use of the cement manufacturer.
- Observe the size specifications on the labels.
- Ensure that the outer diameter of the femoral head matches the inner diameter of the acetabular inlay for restoration.
- Do not use implants/trial implants/instruments with visible damage.
- Instruments and trial implants must be checked for integrity and correct handling/function prior to surgery.
- Use only implants/trial implants/instruments without visible contamination.
- Handle implants/trial implants/instruments exclusively with sterile surgical gloves.
- The implants are approved for single use only, do not reuse!
- PETER BREHM GmbH recommends the obligatory use of intraoperative x-rays to assess the correct positioning of the implant and trial implant and to detect any bone fractures.
- No special positioning of the patient and no special access for the implant is prescribed. The surgeon is free to choose his preferred approach, but must follow the prescribed steps and modify them for his chosen approach. A prerequisite for implantation is the clear exposure.
- In the interest of reliable instrumentation, avoid placing shear forces on instruments during the entire operation. Lateral forces can damage instruments or impair their function.
- Use trial implants exclusively for the selection of corresponding permanent implants.
- Ensure that trial implants are not implanted permanently.
- Avoid surface damage such as scratches and impact points that could be caused by chisels, hammers, luers, clamps, etc., as well as contact or sparks from electrosurgical instruments.
- Carry out implantation carefully (setting prophylactic cerclages if necessary).
- Observe correct handling of the implant components and instruments.
- Ensure that strictly axial access to the medullary canal is guaranteed during the entire operation to avoid transverse forces on instruments.
- Ensure that there is no contact between the bone cerclage and the prosthesis exists.
- Approved ball head lengths made of ceramic and CoCr are: S, M and L in the range from -4 to +4.
- Do not combine CoCr ball heads with sliding surfaces made of ceramic or metal.
- CoCr ball heads can only be combined with polyethylene (PE) inlays.
- Ceramic ball heads can be combined with PE inlays.
- Ceramic ball heads made of BIOLOX®delta / BIOLOX®forte* may only be combined with PE inserts or only with ceramic hip cup inserts made of BIOLOX®delta / BIOLOX®forte.
- For combination with other PETER BREHM GmbH components, please refer to the respective instructions for use. Follow the instrumentation instructions. If unclear, contact PETER BREHM GmbH.

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Surgical Technique

Notes

! NOTE

This brochure is intended for physicians only and is not suitable as a source of information for laypersons. The information about the products and/or procedures described in this brochure is of a general nature and does not represent a medical advice or a medical recommendation. The information provided here does not in any way represent an opinion on the diagnosis or treatment of any specific medical case. The respective patient must be examined individually and advised accordingly. This brochure can neither completely nor partially substitute these measures.

PETER BREHM
Die Präzision in Titan
für den Menschen

PETER BREHM GmbH
Am Mühlberg 30
91085 Weisendorf
Germany

Phone + 49 9135 7103-0
Fax + 49 9135 7103-16
info@peter-brehm.de

peter-brehm.de

CE 0482

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