C.F.P.®
Hip Prosthesis System
Important Information

Please note the following regarding the use of our implants:

1. Choosing the right implant is extremely important.
   The size and shape of the human bone determine the size and shape of the implant and also limit the load capacity. Implants are not designed to withstand unlimited physical stress. Demands should not exceed normal functional loads.

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4. After-treatment is also very important.
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6. Traceability is important.
   Please use the documentation stickers provided to ensure traceability.

7. Further information on the material composition is available on request from the manufacturer.

Follow the instructions for use!

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The Surgical Technique described has been written to the best of our knowledge and belief, but it does not relieve the surgeon of his/her responsibility to duly consider the particularities of each individual case.

Unless otherwise indicated, all instruments are made of surgical stainless steel.
Contents

C.F.P.® Hip Prosthesis System

System Description
02 Bioharmony in Total Hip Replacement
02 C.F.P.® Prosthesis Stem
02 T.O.P.® Cementless Acetabular Cup System

03 Indications/Contraindications

Surgical Technique
03 Preoperative Planning
04 Surgical Approaches

Accessories
17 X-ray Templates

18 Literature

Important Information
Bioharmony in Total Hip Replacement

The LINK® C.F.P.® Prosthesis Stem and the T.O.P.® Cementless Acetabular Cup System have been designed especially for biologically young, active patients. With conventional hip prostheses such patients are subjected to increased rates of aseptic loosening because of their long life-expectancy.

The C.F.P.® and T.O.P.® take into account the biomechanical load and fixation principles dictated by hip anatomy and physiology patterns, the retention of the femoral neck and uncemented fixation techniques to provide strong, stable implant anchorage. They thus provide an optimal basis for any future interventions.

* Collum Femoris Preserving  ** Trabeculae Oriented Pattern

C.F.P.® Prosthesis Stem

- Minimal bone resection because femoral neck and proximal cancellous bone are preserved
- Parts of the circumflex artery’s vascular network are preserved thereby maintaining the vascular supply of the femoral neck after resection of the femoral head
- Stem shape and surgical technique allow uncemented implantation with up to 87% prosthesis-to-bone contact
- Prosthesis stem takes account of anatomical stem shape and physiological anteversion
- Different stem curvatures ensure secure support of the stem at the medial cortex
- Collar allows reintroduction of physiological loads into the femur

T.O.P.® Cementless Acetabular Cup System

- Pressfit fixation with maximal bone contact
- Circular rows of teeth at the cup equator increase primary stability
- Metal casing with pre-drilled holes for additional screw fixation
- Mediocaudal recess allows wider range of motion and protects the psoas tendon and femoral nerve
- Secure fixation of polyethylene insert to metal casing using a “snap-lock mechanism”
- LINK® T.O.P.® polyethylene insert prevents femoral head dislocation when the metal casing is placed at a steep angle, for maximum bone contact
- Standard polyethylene insert is used for normal position of metal casing
Indications/Contraindications – Surgical Technique

Indications/Contraindications

Note: For specific indications/contraindications, see page 19.

Surgical Technique

Preoperative Planning

The aim in preoperative planning is to establish the approximate size of implant required and the optimal position in which to place it.

For the best possible results the appropriate implant should be selected using C.F.P.® X-ray templates which are available at a scale of 1.1:1. When used in combination with recent pelvic X-rays (A/P and M/L views) these templates serve as a useful aid in planning operative procedure and determining implant size.

In planning the resection level, the femoral neck must be considered along with centre of rotation and leg length. The femoral neck should remain intact as far as possible so that the original anatomy can be reconstructed.

The choice of implant should ensure that the greatest possible length of hip stem lies along the Adam’s Bow. Stems are available with two different curvatures, curve A and curve B, for this purpose.

The distal tip of the prosthesis should run along the centre of the medullary canal and should not catch in the cortical tissue.
Surgical Approaches

The choice depends on the surgeon’s experience and his/her decision based on the individual situation.

The following approaches are usual:

- antero-lateral - Watson-Jones (Fig. A)
- direct lateral - Hardinge (Fig. B)
- postero-lateral - Moore (Fig. C)
Surgical Technique

Fig. 1

Dislocation of Femoral Head
After dislocation of the femoral head the femoral neck and the proximal rim of both trochanters are exposed and existing osteophytes of the femoral head removed.

Fig. 2 and 3

Femoral Head Resection
During preoperative planning the osteotomy site is determined by applying tangents as shown in Fig. 3. The line of the resection on the isthmus corresponds to the line connecting the intersection points of the tangents. The distance from the base of the major trochanter is usually 1.5 cm.
Fig. 4

Exposure and Reaming of Acetabulum
Depending on the approach used the leg is turned so that the acetabulum is well exposed. The initial reamer size corresponds to the width of the acetabular entrance. Then reamers with increasing diameters are applied until areas of bloody subchondral compacta become visible but without compromising the supportive structure for secure anchoring of the metal casing. It is essential to keep the reamer head absolutely steady.

Fig. 5

Determination of Cup Size
The cup size is measured to determine the size of metal casing required as the reamed cavity may be larger than was originally intended. If bone quality is poor the surgeon may choose a cup diameter that is 2 mm larger for secure anchorage.

Fig. 6

Implantation of Metal Casing
The metal casing is attached to the appropriate impactor plate, which is fixed to the impactor handle, and driven into the prepared acetabulum. The rim of the casing should be parallel to the acetabular entrance plane for secure seating in the surrounding bone.
Attention:
The entrance plane of the acetabulum and the position of the implanted metal casing determine the choice of UHMWPE insert. An entrance angle of approx. 55° requires a T.O.P.® anti-luxation insert. A standard insert must be chosen, however, if the angle is approx. 45° in order to avoid impingement during abduction.

Fig. 7
The metal casing is aligned for 45° or 55° cup inclinations using an alignment rod which must be attached to the impactor handle. The alignment rod is at an angle of 90° to the body's axis in each case. To achieve 15° anteversion a positioning guide T with pendulum S is available for patients in a supine position (T parallel to S). For patients in a lateral position the impactor handle should be moved 15° in a ventral direction.
Fig. 8

After impaction the central hole is closed with the peep-hole screw.

If additional bone screws are used the locking screws must first be removed from inside the cup.

Fig. 9

Preparation of Proximal Femur

Using a trocar awl a small hole is made in the resected femoral neck, as far medially as possible, to accommodate the pin of the guide.
Surgical Technique

Fig. 10

The guide is adjusted to the planned prosthesis size (A) and placed on the resection site taking the pre-marked hole into consideration. The size of femoral canal opening is determined.

Fig. 11

The femoral canal is opened using a curved bone curette.
Fig. 12

To determine the stem size a curved probe is introduced into the canal starting with one size below the size planned. Each curved probe is inserted up to the ring mark.

The shaft up to the ring mark corresponds to the length of the bone compressor and of the final implanted stem.

Fig. 13

Finally the femoral canal is prepared for seating of the prosthesis stem by compressing the cancellous bone with the bone compressor. The choice of bone compressor depends on the stem curvature determined at the planning stage and the size indicated by the curved probe.

Initially a compressor should be used which is one or two sizes smaller than the planned size of the final implant. At this stage it is important to ensure that the medial teeth of the compressor do not remove the cortical bone at the calcar bow.

When the smallest C.F.P.® prosthesis stem is used preparation of the femoral canal with a smaller compressor is not necessary. In this case preparation of the femoral bone with a curved bone curette and the sizing olive is sufficient.
Surgical Technique

Fig. 14
The bone compressor is driven in below the resection level to achieve a circular, plane surface for the seating of the neckplate by reaming with the calcar reamer.

Attention:
To prevent the reamer from being damaged it must always be pushed as far as possible onto the guide pin before starting to ream.

Fig. 15
Trial Reduction
The plastic trial insert is placed in the metal casing. The pin at the upper rim of the metal casing fits into one of the five notches of the plastic trial insert. Its position depends on the individual case. Under normal circumstances the pin is placed in the central notch.
Surgical Technique

Fig. 16
Trial neck (left or right and 117° or 126° CCD angle) and trial head are attached to the bone compressor in situ. The bone compressor now serves as a trial stem.

Fig. 17
The trial reduction indicates the correct positioning of the trial insert and the head-neck length.
Fig. 18

After removal of the bone compressor the T.O.P.® insert (or standard insert) is impacted according to the position determined during the trial reduction. The pin secures the cup against rotation.

Fig. 19

T.O.P.® Acetabular Cup in situ.
Implantation of the Stem
The C.F.P.® stem is inserted as far as possible into the femoral canal using the inserting forceps.

The design of the C.F.P.® stem incorporates the anatomical anteversion of the femoral neck. Adjustment of the anteversion, as performed when implanting straight stems, would lead to rotational malpositioning and must therefore be avoided.

Placing the tip of the impactor into the recess at the lateral collar the C.F.P.® stem can be driven home into the canal. Before it is finally driven home the neckplate may be removed in order to insert additional bone into the grooves. The fixation screw on the neckplate must then be firmly tightened anticlockwise.
Surgical Technique

Fig. 22

Trial Reduction with Trial Head
As a precaution, a final trial run is performed using coloured plastic trial heads.

Fig. 23

The final prosthesis head is then mounted on the carefully cleaned taper of the stem and fixed with a light blow on the head impactor.
Fig. 24 and 25

### Accessories

#### X-ray Templates

**X-ray templates** for C.F.P.® Prosthesis Stems cementless (with neutral head-neck length), taper 12/14, 110% actual size

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Head Ø mm</th>
<th>CCD angle</th>
<th>Stem size</th>
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<tbody>
<tr>
<td><strong>Curvature A:</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>290-258/52</td>
<td>28, 32, 36</td>
<td>117°</td>
<td>small, medium, large, x-large</td>
</tr>
<tr>
<td>290-258/32</td>
<td>28, 32, 36</td>
<td>126°</td>
<td>small, medium, medium large, large, x-large</td>
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<tr>
<td><strong>Curvature B:</strong></td>
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<td></td>
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</tr>
<tr>
<td>290-259/52</td>
<td>28, 32, 36</td>
<td>117°</td>
<td>small, medium, large, x-large</td>
</tr>
<tr>
<td>290-259/32</td>
<td>28, 32, 36</td>
<td>126°</td>
<td>small, medium, medium large, large, x-large</td>
</tr>
</tbody>
</table>

**Item No.**  | **X-ray templates for T.O.P.® Cementless Acetabular Cup System**  | **Tilastan®, 110% actual size, 2 sheets**  |
<table>
<thead>
<tr>
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<tr>
<td>290-254</td>
<td>for Polyethylene Inserts, Standard</td>
<td>Outer Ø 40-68 mm, Head-Ø 28 mm</td>
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<tr>
<td>290-255</td>
<td>for Polyethylene Inserts, Anti-luxation</td>
<td>Outer Ø 40-68 mm, Head-Ø 28 mm</td>
</tr>
<tr>
<td>290-254/32</td>
<td>for Polyethylene Inserts, Standard,</td>
<td>Outer Ø 40-68 mm, Head-Ø 32 mm</td>
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<tr>
<td>290-255/32</td>
<td>for Polyethylene Inserts, Anti-luxation</td>
<td>Outer Ø 40-68 mm, Head-Ø 32 mm</td>
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</table>

**Instructions for Cleaning and Maintenance**

Specific instructions for instruments are available on request from customer@linkhh.de
Preservation of the femoral neck in hip arthroplasty: results of a 13- to 17-year follow-up
Pipino, Molfetta, Grandizio

C.F.P.® Hüftprothesenschaft und T.O.P.® Hüftpfanne
Link News Nr. 10, Fallbeispiele, Orthopädie aktuell

C.F.P.® Hip Prosthesis Stem and T.O.P.® Acetabular Cup
LINK News Nr. 10, Case Studies, Orthopaedics Update

C.F.P.®/T.O.P.® Hüftprothesensystem
Link News Spezial - Orthopädie aktuell, Fallbeispiele
Veranstaltung Frankfurt a. M., 2002

C.F.P.® prosthetic stem in mini-invasive total hip arthroplasty
F. Pipino
Journal of Orthopaedics & Traumatology, 2004

DEXA evaluation of total hip arthroplasty with neck-preserving technique: 4-year follow-up
F. Biggi, F. Pipino, F. Francolin, R. Lovato
Journal of Orthopaedics & Traumatology, 2004, 5: 156-159

Knochensparende Wechseloperation mit dem C.F.P.®-Hüftprothesenschaft
LINK News Nr. 19

Tissue sparing surgery (TSS) in hip and knee arthroplasty & Tissue-sparing surgery:
25 years' experience with femoral neck preserving hip arthroplasty
F. Pipino & F. Pipino and A. Keller
Orthopaedics & Traumatology, Vol. 7, Nr. 1

Migration Pattern of a Short Femoral Neck Preserving
S.M. Röhrl, M.G. Li, E. Pedersen, G. Ullmark and B. Nivbrant
Clinical Orthopaedics and Related Research, Nr. 448, pp. 73-78, 2006

Follow-up-Studie – 3 Jahre nach Implantation einer Collum femoris erhaltenden
Totalendoprothese der Hüfte (C.F.P.®-Fa. W. Link)
H. Wacha, G. Domsel, R. Motz
Orthopädische Praxis, Jahrg. 43, Heft 8, 2007

Minimal Invasive Hüft-Endoprothetik posterierer Zugang – langzeitiger Nutzen?
G.v.Foerster
MOT 5/2007
### Indications/Contraindications

<table>
<thead>
<tr>
<th>Products</th>
<th>C.F.P. Total Hip Prosthesis</th>
<th>T.O.P. Cementless Acetabular Cup System</th>
<th>BetaCup® W/Acetabular Cup System</th>
<th>BIOLOX® forte + delta® Prosthesis Heads</th>
<th>Hip Acetabular Cups</th>
<th>Prosthesis Heads</th>
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<tr>
<td>General Indications</td>
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<tr>
<td>Mobility-limiting diseases, fractures or defects which cannot be treated by conservative or osteosynthetic procedures</td>
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<td>Osteoarthritis</td>
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<td>X</td>
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<td>Necrosis of the femoral head</td>
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<td>Femoral neck fractures</td>
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<td>Revision after implant loosening</td>
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<td>X**</td>
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<tr>
<td>Contraindications</td>
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<td>Poor general state of health</td>
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<td>Acute and chronic infections, local and systemic</td>
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<td>Allergies due to (implant) materials</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Distinctive muscular-, nerve-, vascular or other diseases which put the affected limb at risk</td>
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<td>X</td>
<td>X</td>
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<td>Insufficient/inadequate bone mass which prevents a stable anchor of the prosthesis</td>
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<tr>
<td>Acetabulum fracture</td>
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<td>Relative Contraindications</td>
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<tr>
<td>Adiposity</td>
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<tr>
<td>Lacking or foreseeable not assured compliance</td>
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<td>Foreseeable overload/overstressing of the joint prosthesis</td>
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<td>Osteoporosis</td>
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<td>Acetabular defects</td>
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</tbody>
</table>

*Dependent on bone density

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