



 **smith&nephew**
CPS-PLUS[®]
Cemented Polished Stem System

Product Information

CPS-PLUS[◇] System

Developed to adapt to the changes of nature

The design rationale of the cemented CPS-PLUS stem – with a highly polished surface which minimizes the adhesion between the bone cement and the implant – is based on the excellent long-term results achieved with this kind of stem for more than 25 years.

The design of the CPS-PLUS stem exploits the fact that a radial expansion of the cement can take place during subsidence of the stem. This expansion ceases when the cement is forced against the surrounding cortical bone. At this point the tension in the bone cement is reduced as the surrounding bone absorbs the forces. Tensile stresses are then converted into compressive stresses.

Designed from the experience of previous generations of implants and refined with today's technology.

In addition to the polished surface, which minimizes the adhesion and wear between the cement and the implant, the geometry of the stem has been optimized to maximise the benefit of this particular method of fixation.



- Highly polished surface
- Wedge-shaped (double taper) design
A/P and M/L with optimized taper angle
- Rectangular cross-section
- Nonlinear taper
- Optimized corner radii
- Optimized proximal cement loading
- Even cement mantle of 2 to 3 mm
- Lateral expansion
- High head-neck ratio
- Anatomical offset graduation

Proximal and distal centraliser



Recognizing the importance of an even cement mantle, a proximal centralizer was developed to complement the distal centralizer. Together these ensure a minimum thickness of the cement mantle and an optimal alignment of the stem in both axes a/p and l/m.

To ensure a complete integration with the surrounding cement mantle, the centralizers are made out of PMMA bone cement and sterilized with ETO. While the proximal centralizer corresponds with the resection plane, both centralizers ensure a minimum thickness of the cement mantle.

It is only by centralizing the component within the broached envelope that a reproducible cement mantle can be obtained. The wings of the distal centralizer are designed to provide a homogeneous cement mantle and prevent cement voids or inclusions during insertion.

Two diameters are available. The two distal centralizers and the proximal centralizer are packaged together in one set. The correct diameter size of the distal centralizer is determined with an IM probe. A space is built into the distal centralizer to avoid high point loading between the tip of the stem and the cement during subsidence.

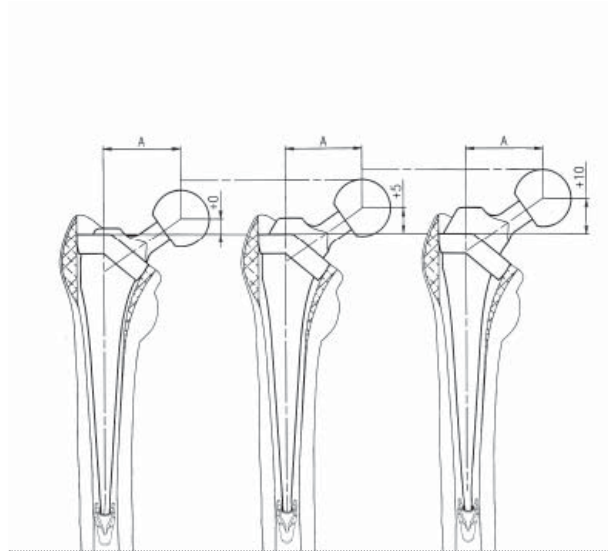
The cementing technique is critically important to achieve optimal results. This should include cleaning the bone bed with pulsed lavage, plugging the medullary canal, and using a high-viscosity bone cement.

The characteristic features of CPS-PLUS are

- **5 stem sizes and one CDH stem**
For optimal femoral sizing.
- **5 head sizes**
To ensure stability and restoration of leg length and offset.
- **Highly polished surface**
For the minimization of adhesion and wear between the cement and the implant, and to allow intended subsidence.
- **Rectangular cross-section**
For best possible rotational stability, based upon anatomical cross-section proportions.
- **Wedge-shaped (double taper) design A/P and M/L with optimized taper angle**
To provide an even expansion of the bone cement during subsidence of the stem.
- **Optimized proximal cement loading**
To avoid cement fractures, the optimal geometry has been evaluated and tested. Constant cement strain along the stem axis. Progressive (anatomical) widening in the proximal portion. Proximal load transfer.
- **Optimized corner radius**
Minimal cement stresses in axial loading and torsion. Optimised stress distribution by avoiding stress peaks.
- **Lateral expansion – Additional rotational stability**
- **High head-neck ratio**
2.5 at 28 mm, therefore minimized risk of impingement (neck/cup).
- **PMMA centralizer ETO sterilized**
For complete integration in bone cement mantle.
- **Proximal centralizer**
For optimal alignment of stem axis in both planes. For pressurization. For even cement mantle. For optimal leg length control.
- **Distal centralizer**
With inner void for stem subsidence. With wings (for homogeneous cement mantle of 2–3 mm thickness).
- **Offset**
One optimal offset for each stem size, based on main anatomical conditions.
- **Individual leg length control**
- **Material**
Stainless steel according to ISO 5832-9, forged.
- **Bone cement**
For optimal results, the use of high-viscosity bone cement is recommended.
- **Instruments**
Functional instruments for noncomplicated, reproducible surgery.

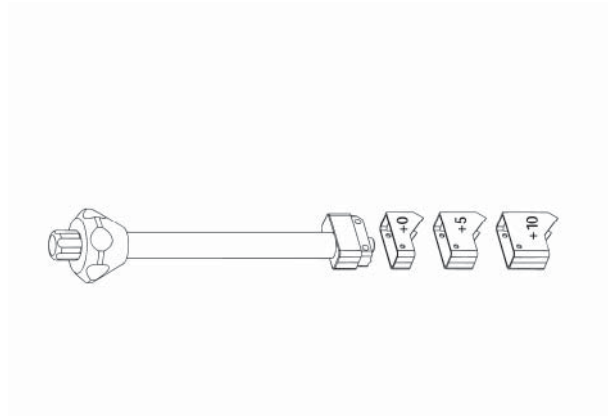
Functional instruments for high quality results

We recognize that functional instruments are essential for successful surgery. The CPS-PLUS® instruments have therefore been designed to meet all eventualities, and to facilitate correction of leg length and restoration of offset with the adjustable inserter and the trial broaches.



Individual leg length control

The leg length can be individually adjusted in the femoral axis according to the marking «+0», «+5» and «+10».

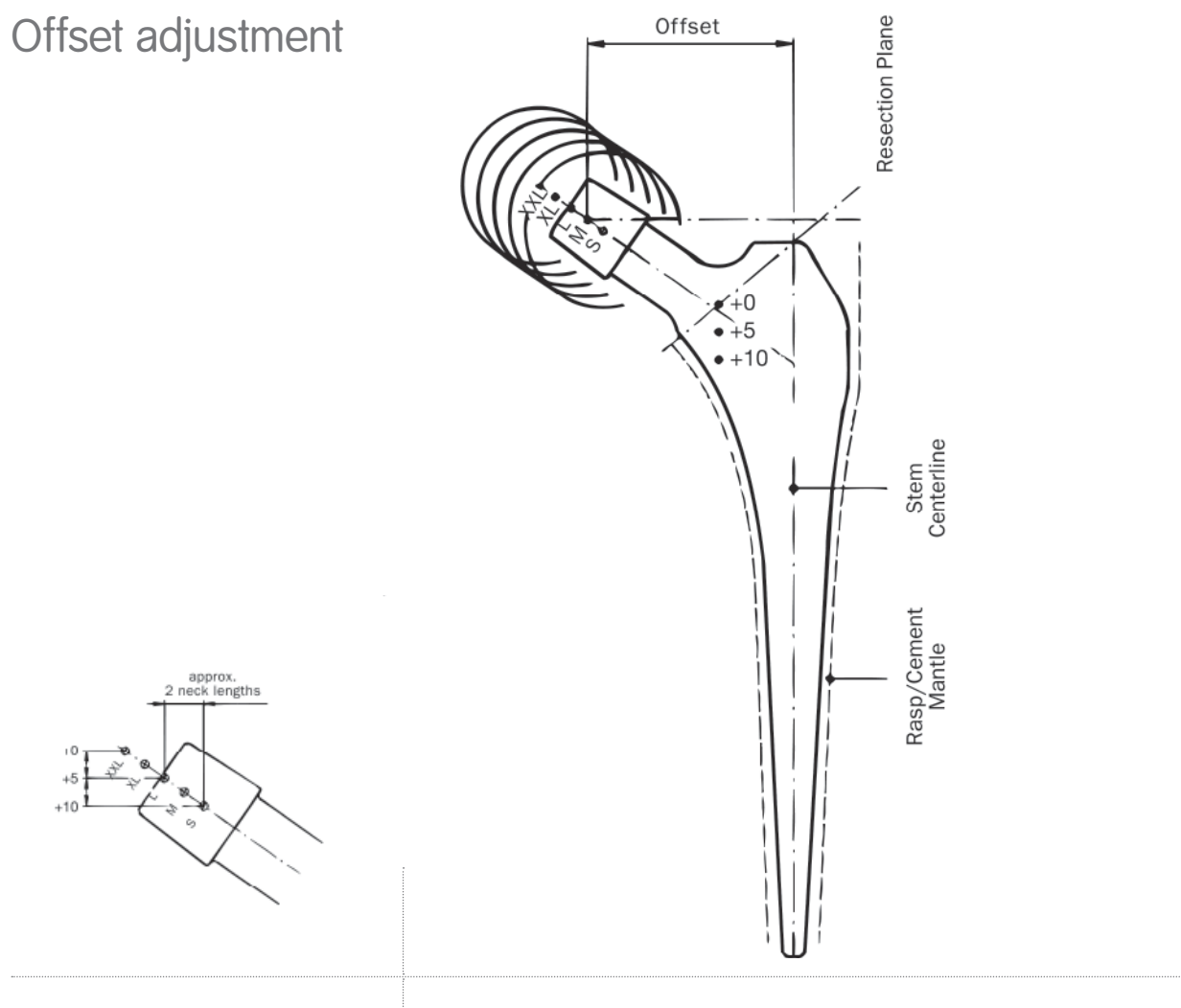


Adjustable box positioner

There are three box positioners that can be attached to the femoral stem inserter. These provide the facility to fully seat the implant (+0), or leave it 5 mm (+5) or 10 mm (+10) proud.

When considering the leg length implications, an increase or decrease of two head lengths is equivalent to 5 mm.

Offset adjustment



Offset Cemented Polished Stem

Ball head	Size CDH	Size 1	Size 2	Size 3	Size 4	Size 5
S	31.2	34.5	36.0	37.4	38.4	39.4
M	34.1	37.4	38.9	40.3	41.3	42.3
L	37.0	40.3	41.8	43.2	44.2	45.2
XL	39.8	43.1	44.6	46.0	47.0	48.0
XXL	42.7		47.5	48.9	49.9	50.9

Offset can be adjusted by further seating of the broach (\pm further resection of the femur) and applying a longer neck length (increased offset) or by leaving the broach proud and applying a shorter neck length (decreased offset).

Manufacturer

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For further information please
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