

# CS-PLUS<sup>®</sup> CSL-PLUS<sup>®</sup>

The Cemented Stem System According to  
Prof.Dr.med.H.O.Dustmann

Product Information



# CS-PLUS<sup>®</sup>-and CSL-PLUS<sup>®</sup>-System

For older, sportive less

*Prosthesis design proven  
over 10 years in more than 50'000  
implantations*

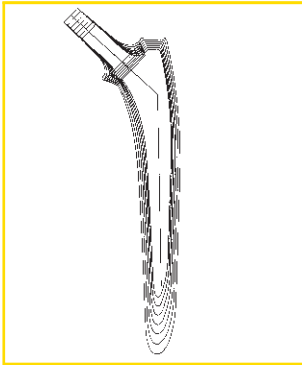
- ✓ Anatomically adapted size increase
- ✓ Secure implant-cement-bonding
- ✓ Reinforced cement compression in the calcar region
- ✓ Optimal load transmission
- ✓ Design-supported centring in the cement mantel
- ✓ Quick and safe implantation and explantation
- ✓ Comprehensive product portfolio for primary and revision indications

active patients



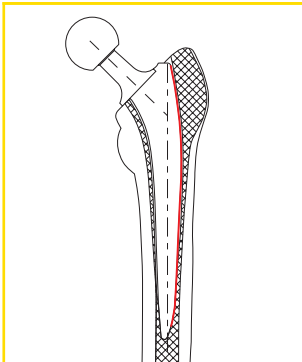
## *The 7PLUS points*

### *Prosthesis design*



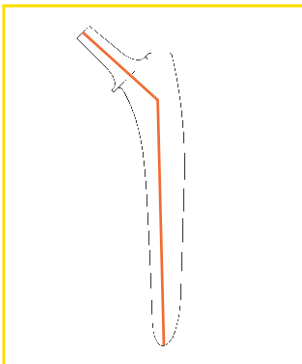
The prosthesis design with anatomically adapted size increase (growth factors) over 7 stem sizes allows an optimal selection for the individual anatomic make-up of the patient.

### *Centring*



The CS-PLUS<sup>®</sup> aligned design between the trochanter area, calcaneal arch and prosthesis tip (ski tip) facilitates centring in the surrounding cement bed.

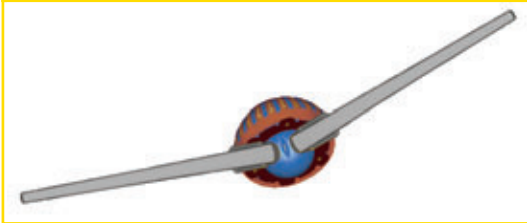
### *CCD angle*



The CCD angle of 134° allows good anatomical reconstruction and an optimal load transmission in the proximal femur end.



## Range of motion



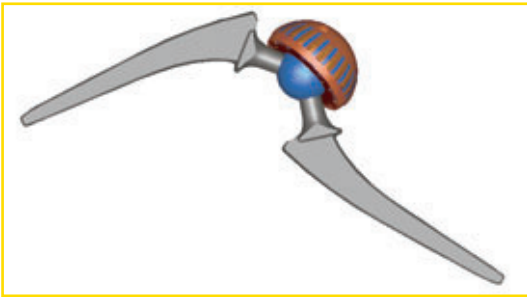
The wide range of motion results from the anatomically favourable stem construction.

Extension 81°

Flexion 121°

Total 202°

[1]



Adduction 60°

Abduction 70°

Total 130°

[1]



Lateral rotation 87°

Medial rotation 129°

Total 216°

[1]

### Materials:

Alloy IMG 30 (FeCrNiMcNbN) in accordance with ISO 5832-9 ensures high strength.

### Cone:

The standard cone 12/14 allows the combination with ball heads diameter 22, 28, 32 and 36 mm and with Plus Orthopedics special ball heads.

[1] All values measured with EP-FIT PLUS ® Press-Fit cup, size 50, 45°inclination, 15°anteversion, ball head size 28M

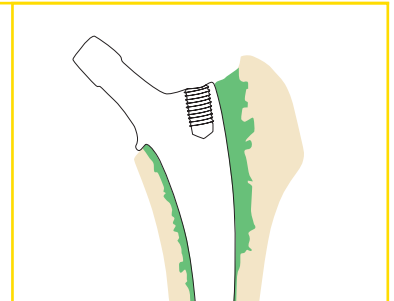
## *Prosthesis collar*

The small prosthesis collar fits flush with the calcar, prevents the stem from sinking postoperatively and serves as orientation guide during implantation.



## *Axial inserting and extraction device*

The threaded hole with the standard thread (M6) supports stem implantation in combination with the inserter as well as the removal of the prosthesis in combination with the extraction screw in case of revision.



## *Machined surface*

The blasted stem surface (Ra approx. 4–6  $\mu\text{m}$ ) meets the requirements for a secure cement implant bonding.



## Study results

H. O. Dustmann,  
S. Osburg

Klinik für Orthopädie und  
Orthopädische Chirurgie  
am St.-Joseph-Krankenhaus,  
Engelskirchen

**An Innovative Endoprosthesis Stem (CS-PLUS) – Experimental and Clinical Study**

Orthopädische Praxis 9/2003, ed. 39, p. 548–554

### Summary

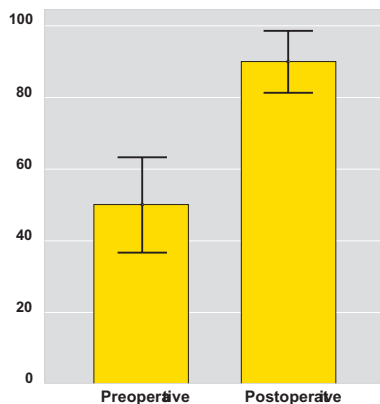


Fig. 1

### Material and methods

In this study 121 patients were fitted with a CS-PLUS® stem between March 1992 and December 1994. The study population was 69.4% female and 30.6% male, while the average age was 70.8. It was possible to carry out radiological and clinical follow-up examinations on 103 cases (95 patients). The average follow-up period was 6.6 years (minimum 3.4, maximum 8.6). The clinical results were assessed according to the Harris Hip Score, and the results were divided into four categories; very good (90–100 points), good (80–89 points), moderate (70–79 points) and poor (<70 points). The x-rays (a/p and side projection) were categorized according to Gruen et al. and Johnston et al. The degree of periarticular ossification was classified according to Brooker. A change in position (or sinking) of the stem relative to the primary x-ray as well as a cement or implant fracture was assessed as definite sign of loosening.

In the experimental part of the study, femoral cross cuts of the implants were taken from 17 corpses to measure the cement mantle thickness. A good result was classified as  $\geq 2$  mm.

### Results

The Harris Hip Score improved on average from 49.8 (standard deviation 14.3) to 92 (standard deviation 6.4) (see fig. 1). The classification in the four assessment categories resulted in the distribution seen in fig. 2. The rates of poor (<70) and moderate (70–79) results, with 1% and 5% respectively, are remarkably low. The study results thus reflect that 98% of patients regard the operation outcome as good after an average of 6.6 years. Standing at 22.3% also the frequency of periarticular ossification is low compared to references stated in literature, taking into consideration all severity codes. The revision rate following aseptic loosening totalled 1.9%.

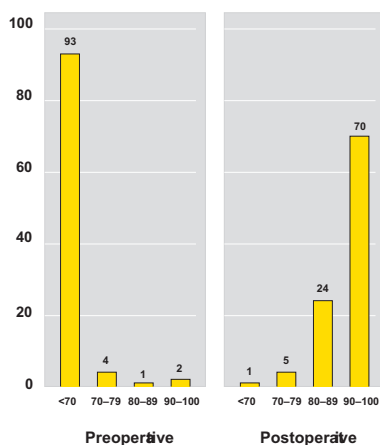


Fig. 2  
Harris Hip Score

In the experimental part, the Chi square test of independence was used to statistically verify a significant difference in the cement mantle thickness as regards to the implantation angle of the stem ( $p = 0.009$ ). In contrast there was no statistically significant difference depending on the proportion of the rasp size to the implant size used ( $p = 0.054$ ). The CS-PLUS® stem should be implanted centrally as accurate as possible. Implanting the stem, an angle up to 2 degrees valgus is recommended.

# CS-PLUS®-and CSL-PLUS®-System

The stem portfolio offers an ideal

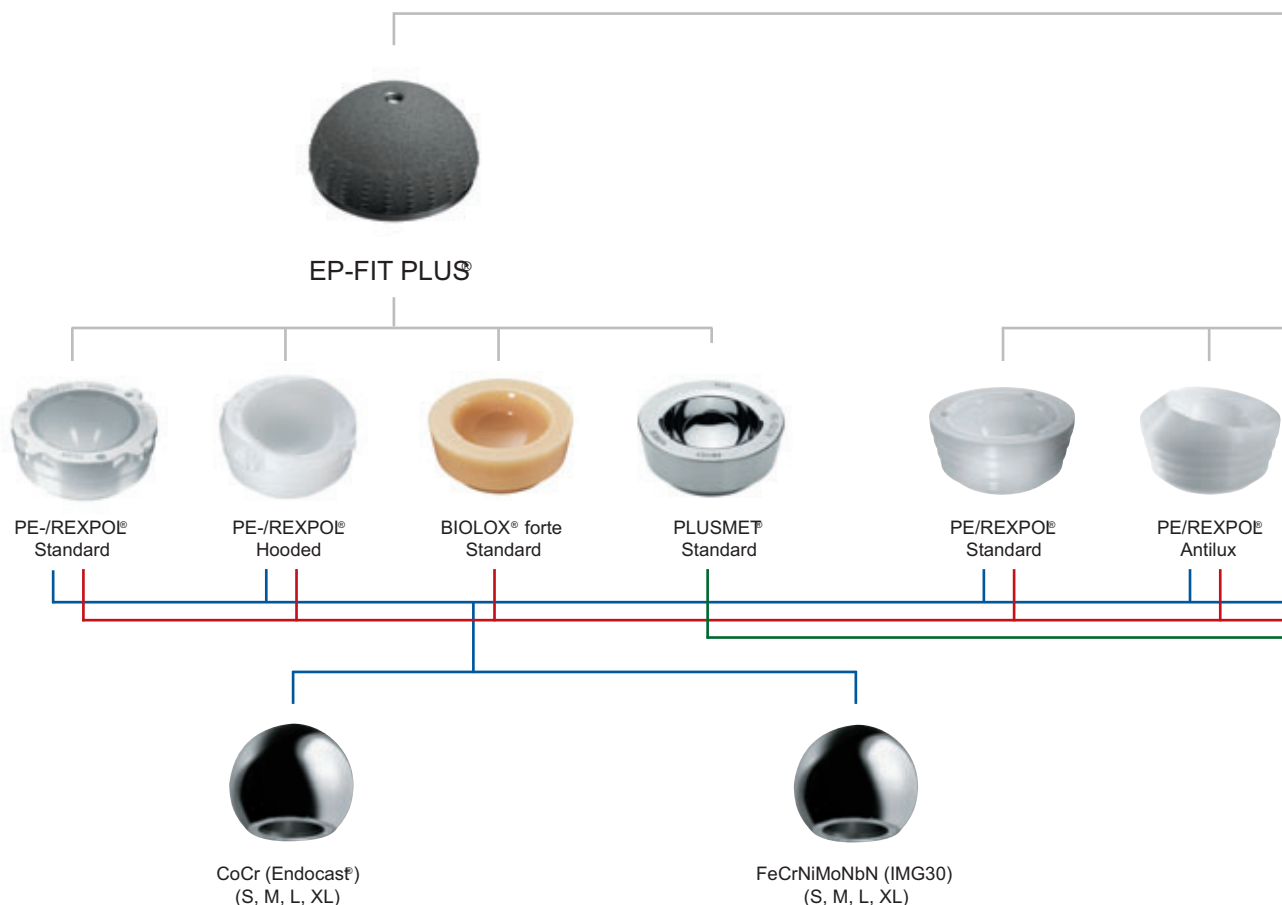
*Seven standard and two revision stem sizes cover the major primary and revision indications.*

## Stems

## Shells

## Inserts

## Ball heads



# selection



CS-PLUS® & CSL-PLUS®

## Standard stems, cone 12/14

Item No.	Size	Length (mm)
11071	1	135
11072	2	140
11073	3	146
11074	4	152
11075	5	159
11076	6	165
11077	7	172

## Revision stems, cone 12/14

Item No.	Size	Length (mm)
11313	3	183
11315	5	199



BICON-PLUS®



Fracture head



Bipolar head



BOFOR®



BIOLOX® forte  
Standard



BIOLOX® forte  
Antilux



PLUSMET®  
Standard



PLUSMET®  
Antilux



PE insert  
Standard



PE insert  
Antilux



BIOLOX® forte  
(S, M, L)



BIOLOX® OPTION  
(S, M, L, XL)



PLUSMET®  
(S, M, L, XL)

**Manufacturer**

Smith & Nephew Orthopaedics AG  
Erlenstrasse 4a  
6343 Rotkreuz  
Switzerland

For further information please  
contact our local sales office.  
[www.smith-nephew.com](http://www.smith-nephew.com)



**AURA Medical s.r.o.**

K Verneráku 4  
148 00 Praha 4  
Tel.: 244910200  
[aura@auragroup.cz](mailto:aura@auragroup.cz)  
[www.auragroup.cz](http://www.auragroup.cz)