



**Original
M. E. Müller®
Straight Stem**



**Only the Really Big Ideas
Can Take Constant Change in their Stride**



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There are few implants that have made history and are still used to this day. The Original Müller Straight Stem prosthesis falls into this category.

Since its creation in 1977, the Original M. E. Müller Straight Stem prosthesis has remained essentially unchanged; very good 20-year results confirm its well-founded concept. In 26 years (1977–2003), the Original M. E. Müller Straight Stem has been implanted over a million times.

It is not surprising that the Müller Straight Stem prosthesis is used all over the world, as its design has long since stood the test of time. Its impressive ease of implantation and its high tolerance of errors have set standards in the field of hip replacement, so that orthopedic surgeons regard it as the epitome of a safe and tested implant.

Original M. E. Müller Straight Stem

The System



*Müller Straight Stem,
standard*



*Müller Straight Stem,
lateral*



CDH Stem

The Biomechanical Concept

Dual Anchorage for Maximum Stability

Self-locking as Anchorage

Principle

The Straight Stem prosthesis is anchored by the body of the prosthesis locking in the femur. The aim is form-fitting contact in the frontal plane. Additional locking is frequently achieved in the sagittal plane through the curvature of the femur. Together with the bone cement, these anchorage components ensure secure fixation. In case of a valgus hip, the stem locks at three points in the frontal plane: usually medially at the calcar and at the tip of the prosthesis, and, thanks to the 6° taper, laterally in the metaphysis.

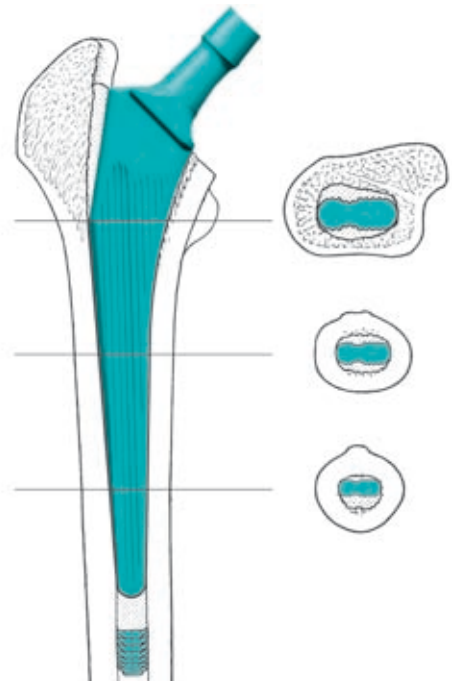
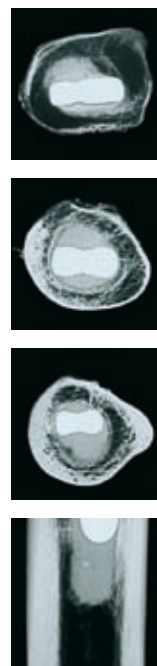
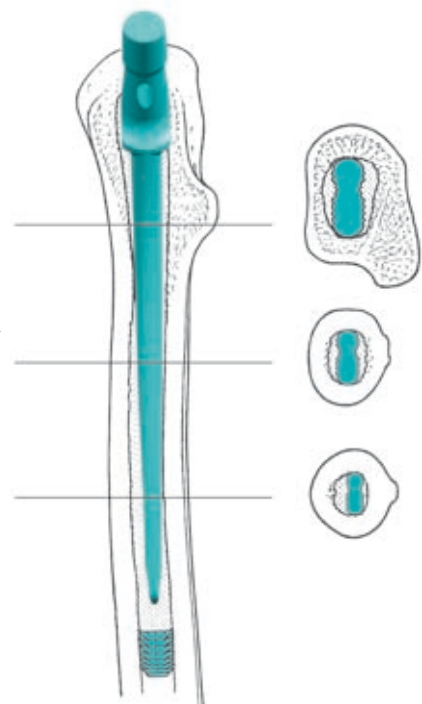
Safety through Rotatory Stability

Thanks to its flat cross-section, the prosthesis locks itself in the bone. Through this, rotatory stability is achieved, which is additionally secured by the dorsal/ventral cement mantle.

The high degree of rigidity of the Straight Stem protects the cement against fatigue fracture and the shattering that results from this, thus protecting the prosthesis from premature loosening.

Bond with the Cement

The fine-blasted surface of the Straight Stem provides the cement with very favorable conditions for adhesion. The fluted structure of the stem, with the two particularly marked longitudinal grooves a/p in the stem axis, enables very good cement adhesion. The small proximal collar serves to compress the cement, prevents the stem from sinking into the cement, and, together with the fine-blasted surface of the Straight Stem, it achieves a very stable anchorage of the implant.



The Design of the Prosthesis Ahead of its Time

Uniform Stem Geometry in the Straight Stem Range

The Straight Stem prosthesis is characterized by its simple, clear geometry.

It has a taper angle of 6° and a constant medial contour in relation to the center of rotation that remains consistent across all sizes. The distance between the stem axis and the center of rotation increases evenly with increasing size. This facilitates preoperative planning, as does its constant CCD angle of 135° .

Stem Design for Ease of Implantation

The Straight Stem is easy to implant, and can therefore be mastered after a decidedly short learning curve.

Thanks to its proximal chamfer, the greater trochanter does not have to be opened up in a heavily lateral direction right into the muscle insertions during reaming and subsequent insertion of the prosthesis, as is the case with many other cemented prostheses. Due to its straight shape, the stem is positioned neutrally; it automatically finds the middle axis, and a varus or valgus position is avoided. Thanks to its longitudinal structure, the geometry of the Straight Stem prosthesis allows extraction without great loss of bone and without fracture in the case of revision surgery.

Offset Options through Standard and Lateral Versions

For more than 20 years, the Straight Stem prosthesis has been available with an additional offset option, the lateralized Straight Stem prosthesis. The lateralized Straight Stem prosthesis, with its 8 mm larger offset (neck displaced by 8 mm in medial direction) results in a lateralization of the femur. It is used for patients in whom the implantation of a standard version would result in an undesired medialization of the femur. This modern concept allows reconstruction of the anatomical conditions.

Maximum Spectrum of Indications

Due to the extensive range of sizes and the availability of standard and lateral versions, the Original *M. E. Müller* Straight Stem covers almost the entire spectrum of indications, including operations on less markedly dysplastic hips and revisions. Thanks to its flat body, the prosthesis can also be implanted in cases of marked antetorsion and strong antecurvature of the femur. Because of the immedi-

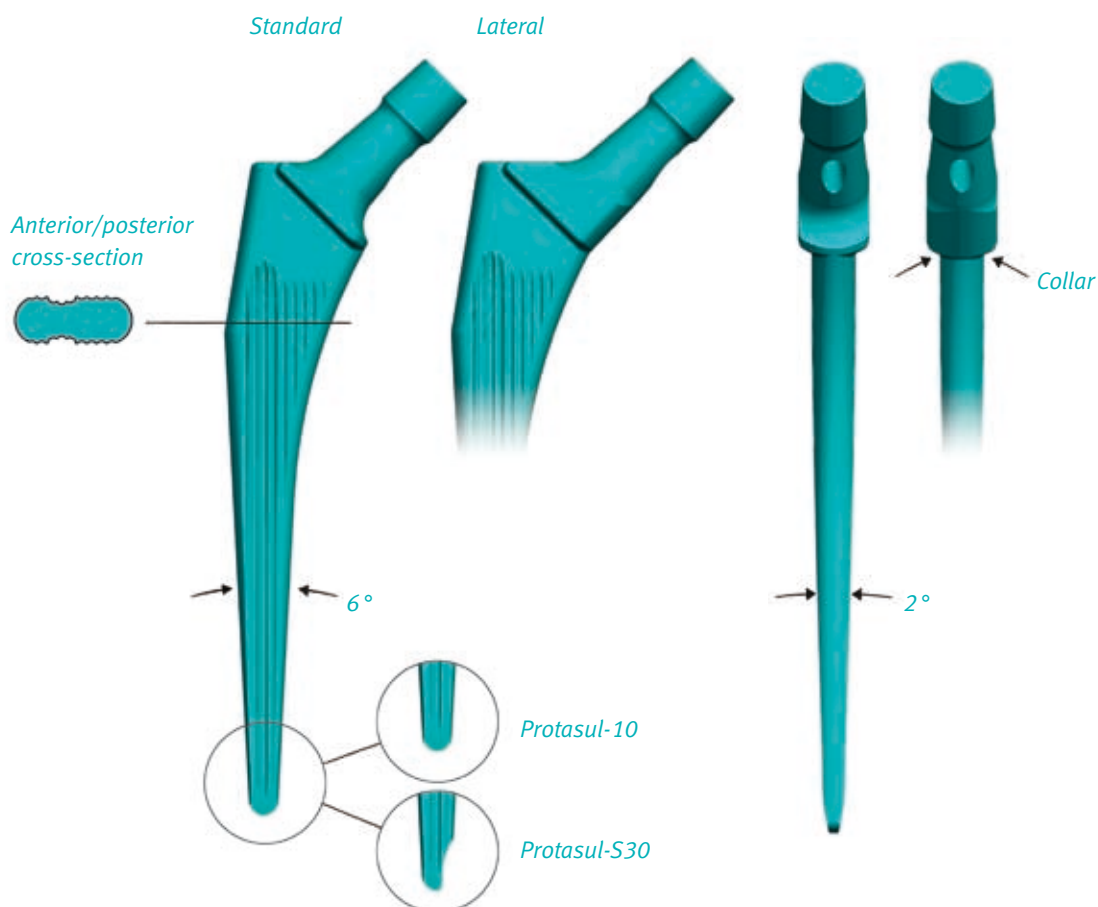
ate stability directly after the operation, the Straight Stem prosthesis is recommended for osteoporotic bone. The Original *M. E. Müller* Straight Stem has proved itself in patients of all age groups.

CDH – Straight Stem Model for Dysplasia

In the case of small hip conditions, particularly in cases of dysplastic acetabula, congenital dislocation of the hip and narrow medullary cavities, the CDH (Congenital Dysplastic Hip) prosthesis – the “small Straight Stem” – is indicated.

Contraindications

Revision cases with extensive proximal bone loss represent a contraindication for the Straight Stem.



The Instruments

Concentrating on the Essentials

Modern, Compact Set of Instruments

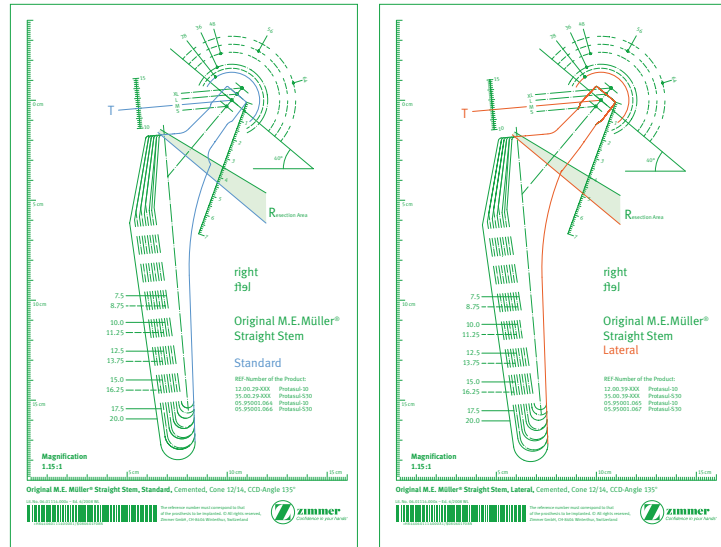
The highly functional instruments are designed to match the simple, standardized surgical technique. For decades, these instruments have been standard equipment for hip operations, and are used in many prosthetic systems.

The new and practical synthetic tray accommodates the ingenious instruments for the Original *M. E. Müller* Straight Stem. The tray can be assembled to suit the wishes and requirements of the surgeon and the surgical staff.



Instructive Preoperative Planning

As a simple but effective aid for the optimization of orthopedic surgery, preoperative planning has been used with success since the 1960s. The new template facilitates preoperative planning, which is an important factor in short-term and long-term success of hip operations.



Planning template for the Original M.E. Müller Straight Stem, Standard and Lateral, Magnification 1.15:1
Lit. No. 06.01114.000

The Long-Term Results

Convincing Proof of Integrity

The excellent results from long-term clinical studies are the best arguments for the *Original M. E. Müller Straight Stem*.

Clinical Results

Year	Author	Published in	Implant/ no. of hips	Follow-up (all facts)	Combined survival rate, stem (all facts)	Survival rate, stem (all facts)	Survival rate, stem (aseptic loosening)
2007	Riede et al.	The M. E. Müller straight stem prosthesis: 15 years follow up. Survivorship and clinical results	44	15 years			94 %
2005	Schweizer et al.	Five-year results of two cemented hip stem models each made of two different alloys. Arch Orthop Trauma Surg (2005); 125: 80–86	161	5 years			
2003	Kirschner	20 years of primary hip replacement using M. E. Müller Straight Stem. Paper 1232, EFORT, Helsinki, June 2003	200	20 years			82.5 %
2003	Ochsner	Die Hüfttotalprothese, Implantationstechnik und lokale Komplikationen. Springer, Berlin, 2003	401	15 years			94.3 %
2003	Schweizer et al.	Ten-year follow-up of primary straight stem prosthesis (MEM) made of titanium or cobalt chromium alloy. Arch Orthop Trauma Surg (2003); 123: 353–356	433	10 years			98.2%(CoCr) 80.9% (Ti)
2002	Malchau et al.	Prognosis of Total Hip Replacement. Update of Results and Risk-Ratio Analysis for Revision and Re-revision from the Swedish National Hip Arthroplasty Register, 1979–2000	1346	10 years	97.8 %		
2001	Acklin et al.	Nine-year results of Müller cemented titanium Straight Stems in total hip replacement. Arch Orthop Trauma Surg (2001); 121: 391–398	540	9 years	96.8%		98.4%
2001	Havinga et al.	Results with the M. E. Müller cemented Straight Stem total hip prosthesis. A ten-year historical cohort study in 180 women. J Arthroplasty 2001; 16(1): 33–36	180	10 years	94 %		
2001	Räber et al.	Fifteen-year result of the Müller CoCrNiMo Straight Stem. Arch Orthop Trauma Surg (2002); 121: 38–42	112	15 years			88.1%
2000	Lützner et al.	Langzeitergebnisse mit der Original M.E. Müller Geradschaftprothese aus CoNiCrMo-Schmiedelegerung (Protasul-10). Orthopädische Praxis 36, 7 (2000): 416–421		9–10 years			
1998	Malchau et al.	Prognosis of Total Hip Replacement, revision and re-revision rate in THR: a revision-risk study of 148,359 primary operations. Scientific Exhibition presented at the 65th Annual Meeting of the American Academy of Orthopaedic Surgeons, February 19–23, New Orleans, 1998	1,581	9 year	97.2%		
1997	Kohler et al.	Long-term results and survivorships of Protasul 10 straight stem Müller femoral hip prosthesis. Swiss Surg 1997; 3: 44–48	88	10 year	89%		
1997	Oosterbos et al.	Prognosis of the Müller Straight Stem. Hip International 1997; 7(3): 101–109	214	10 years	91.2 %		
1997	Sperling et al.	Müller Straight Stem – survival rate after 12 years. Acta Orthop Scand 1997; 68 (Suppl 277): 28	621	12 years	95.1 %		
1997	Träger et al.	10-Jahre-Ergebnisse der Müller-Geradschaft-Prothese im Vergleich zum Müller-Geradschaft in Kombination mit der unbeschichteten unazementierten RM-Pfanne. Paper No. 13, Bremen Norddeutsche Orthopädenvereinigung, Bremen, Juni 1997	158	10 years		98 %	
1995	Brémant	Résultats à 10 ans de la prothèse totale de hanche cimentée autobloquante de M.E. Müller. Rev Chir Orthop 1995; 81: 380–388	193	10 years		98.3%	
1989	Wilson-McDonald et al.	Comparison between straight- and curved-stem Müller femoral prosthesis. 5- to 10-year results of 545 total hip replacements. Arch Orthop Trauma Surg (1989); 109: 14–20	381	10 years			97 %



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