

ACTINIA®

cementless stem with collar

Why a cementless stem with collar?¹

- lower revision rate
- lower risk of aseptic loosening
- lower risk of periprosthetic fracture



¹The following statements are based on registry data for various cementless stems with collars from different manufacturers.

Registry Data

Australia

Collarless stems have a higher rate of revision compared to collared stems. Collarless stems have a higher rate of revision for fracture and loosening (AOANJRR 2023).^[1]

Cumulative Percent Revision of Cementless Primary Total Conventional Hip Replacement by Stem Collar Use (Primary Diagnosis OA). (Table HT23, AOANJRR 2023).^[1]

Stem Collar Use	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	9 Yrs	15 Yrs	20 Yrs
Collared	1331	54341	1.6 (1.5, 1.7)	2.3 (2.2, 2.5)	2.7 (2.6, 2.9)	3.6 (3.3, 3.8)	5.3 (4.5, 6.2)	---
Collarless	7254	204058	1.8 (1.7, 1.9)	2.5 (2.5, 2.6)	3.0 (3.0, 3.1)	4.2 (4.0, 4.3)	6.0 (5.8, 6.2)	7.5 (7.1, 7.8)
TOTAL	8585	258399						

Note: Restricted to modern prostheses

OA = osteoarthritis

Norway

The standard collared stem was associated with a lower risk of stem revision, aseptic loosening, and periprosthetic fracture than was the standard collarless stem.^[2]

Biomechanic in-vitro-studies

The collar may improve implant stability by transferring compressive loads to the medial cortical bone, thus reducing stem subsidence.^[3, 4]

The addition of a collar to a cementless stem increases the torque required to cause a periprosthetic fracture. The collar counteracts the rotation of the stem relative to the femoral canal and thus reduces the risk of fracture. For this protective effect the calcar collar contact is essential (max. distance 1 mm).^[5, 6]

¹Smith PN, Gill DR, McAuliffe MJ, McDougall C, Stoney JD, Vertullo CJ, Wall CJ, Corfield S, Page R, Cuthbert AR, Du P, Harries D, Holder C, Lorimer MF, Cashman K, Lewis PL. Hip, Knee and Shoulder Arthroplasty: 2023 Annual Report, Australian Orthopaedic Association National Joint Replacement Registry, AOA: Adelaide, South Australia. 2023. <https://doi.org/10.25310/YWQZ9375>.

²Melbye SM, Haug SCD, Fenstad AM, Furnes O, Gjertsen JE, Hallan G. How Does Implant Survivorship Vary with Different Corail Femoral Stem Variants? Results of 51,212 Cases with Up to 30 Years Of Follow-up from the Norwegian Arthroplasty Register. Clin Orthop Relat Res. 2021 Oct 1;479(10):2169-2180. doi: 10.1097/CORR.0000000000001940. PMID: 34427568; PMCID: PMC8445552.

³Lamb JN, Boetz J, Messer-Hannemann P, Adekanmbi I, van Duren BH, Redmond A, West RM, Morlock MM, Pandit HG. A calcar collar is protective against early periprosthetic femoral fracture around cementless femoral components in primary total hip arthroplasty. Bone Joint J. 2019;101-B(7):779-786. doi:10.1302/0301-620X.101B7.BJJ-2018-1422.R1

⁴Staats K, Windhager R. Kragendesign in der Hüftendoprothetik. JATROS Orthopädie & Traumatologie Rheumatologie 5/2023.

⁵Johnson AJ, Desai S, Zhang C, Koh K, Zhang LQ, Costales T, O'Toole RV, Manson TT. A Calcar Collar Is Protective Against Early Torsional/ Spiral Periprosthetic Femoral Fracture: A Paired Cadaveric Biomechanical Analysis. The Journal of Bone and Joint Surgery 102(16):p 1427-1433, August 19, 2020. doi: 10.2106/JBJS.1901125.

⁶Lamb JN, Coltart O, Adekanmbi I, Pandit HG, Stewart T. Calcar-collar contact during simulated periprosthetic femoral fractures increases resistance to fracture and depends on the initial separation on implantation: A composite femur in vitro study. Clinical Biomechanics, Volume 87, 2021, 105411. ISSN 0268-0033. <https://doi.org/10.1016/j.clinbiomech.2021.105411>.