

# Performance of modern collared and collarless stem designs 10 years post-surgery

David Fawley<sup>1</sup>, Sean Croker<sup>2</sup>, Rodrigo Diaz<sup>3</sup>

<sup>1</sup>DePuy Synthes, Warsaw, IN; <sup>2</sup>DePuy Synthes, West Chester, PA; <sup>3</sup>DePuy Synthes, Palm Beach Gardens, FL  
Email of Presenting Author: RDiaz16@its.jnj.com

**Disclosures:** David Fawley (3A; Employed by DePuy Synthes, 4; Johnson & Johnson), Sean Croker (3A; Employed by DePuy Synthes, 4; Johnson & Johnson), Rodrigo Diaz (3A; Employed by DePuy Synthes, 4; Johnson & Johnson)

**INTRODUCTION:** There are questions about whether rotational stability and survivorship is increased with use of collared stems in primary uncemented total hip arthroplasty (THA)<sup>1,2</sup>. The objective of this evaluation was to review the survivorship of modern collared and collarless stem designs, from one manufacturer, used in primary uncemented THA.

**METHODS:** We conducted a retrospective registry review from the Australian Orthopaedic Association National Joint Replacement Registry (AOA NJRR) and a company-sponsored registry (CSR). Kaplan-Meier (KM) device survivorship was performed with revision of any component as the endpoint.

**RESULTS:** A total of 116,494 primary THA cases were evaluated: 85,851 from the AOA NJRR (49,428 collared; 36,423 collarless) and 30,643 from the CSR (17,531 collared and 13,112 collarless). At 10 years post-operatively, survivorship was 96.3% (AOA NJRR) and 99.3% (CSR) for collared stems and 94.9% and 98.3% for collarless stems for AOA NJRR and CSR respectively. Survival rates began to differ at around 5 years after surgery in the AOA NJRR and as early as 1 year after surgery in the CSR. See Figure 1 for more detail. Revisions due to fracture (1.2% vs. 0.3%) and loosening (1.4% vs. 0.6%) were higher for collarless stems in the AOA NJRR.

**DISCUSSION:** All stems analyzed in our evaluation had excellent survivorship out to 10 years post-op. A recent systematic review showed similar survival rates for collared and collarless stems in primary THA. In this cohort of over 100,000 modern stems, collared stems showed better survivorship when compared with collarless in primary uncemented THA.

**SIGNIFICANCE/CLINICAL RELEVANCE:** This study adds to the existing literature comparing the performance of collared and collarless stems in uncemented THA. In our study, reviewing long-term survivorship, collared stems outperformed collarless stems.

**REFERENCES:** 1) Ait-Si-Selmi, T., Vidalain, J. P., Ramos-Pascual, S., Kuratle, T., Saffarini, M., Dejour, E., & Bonnin, M. P. (2024). Outcomes of total hip arthroplasty using collared versus collarless uncemented HA-coated stems: a meta-analysis. EFORT Open Reviews, 9(4), 264-275. 2) Giovanoulis, V., Kenanidis, E., Aïm, F., Gamie, Z., Marmor, S., Potoupnis, M., ... & Tsiridis, E. (2024). Collared versus collarless hydroxyapatite-coated stems for primary cementless total hip arthroplasty; a systematic review of comparative studies. Is there any difference in survival, functional, and radiographic outcomes?. SICOT-J, 10.

Figure 1: Cumulative Percent Revision (CPR) for AOA NJRR and CSR

AOA NJRR	1yr	2yr	3yr	4yr	5yr	6yr	7yr	8yr	9yr	10yr
All Collared CPR (95% CI), n	1.6 (1.5, 1.7), 44088	2.0 (1.8, 2.1), 38761	2.3 (2.2, 2.5), 34104	2.6 (2.4, 2.7), 29244	2.8 (2.6, 2.9), 25047	3.0 (2.9,3.2), 20623	3.2 (3.0, 3.4), 16445	3.4 (3.2, 3.6), 12286	3.6 (3.4, 3.8), 9121	3.7 (3.5, 3.9), 6785
All Collarless CPR (95% CI), n	1.7 (1.6, 1.9), 35455	2.2 (2.1, 2.4), 34598	2.6 (2.5, 2.8), 33569	2.9 (2.7, 3.1), 32042	3.2 (3.0, 3.4), 30492	3.5 (3.3, 3.7), 28616	3.9 (3.7, 4.1), 26487	4.2 (4.0, 4.4), 24021	4.7 (4.4, 4.9), 21029	5.1 (4.8, 5.3), 17883

CSR	1yr	2yr	3yr	4yr	5yr	6yr	7yr	8yr	9yr	10yr
All Collared CPR (95% CI), n	0.34 (0.26, 0.44%), 15690	0.40 (0.31, 0.50%), 14187	0.45 (0.36, 0.56%), 13020	0.48 (0.38, 0.60%), 11571	0.51 (0.41, 0.63%), 10126	0.57 (0.46, 0.71%), 8700	0.60 (0.48, 0.74%), 7433	0.67 (0.54, 0.83%), 6520	0.72 (0.58, 0.89%), 5433	0.74 (0.60, 0.92%), 4260
All Collarless CPR (95% CI), n	0.94 (0.79, 1.13%), 12001	1.10 (0.93, 1.30%), 11222	1.20 (1.02, 1.41%), 10634	1.29 (1.11, 1.51%), 9984	1.38 (1.18, 1.60%), 9348	1.49 (1.29, 1.73%), 8763	1.55 (1.34, 1.79%), 8241	1.64 (1.42, 1.89%), 7560	1.71 (1.48, 1.97%), 6743	1.72 (1.50, 1.99%), 5823