

Appendix

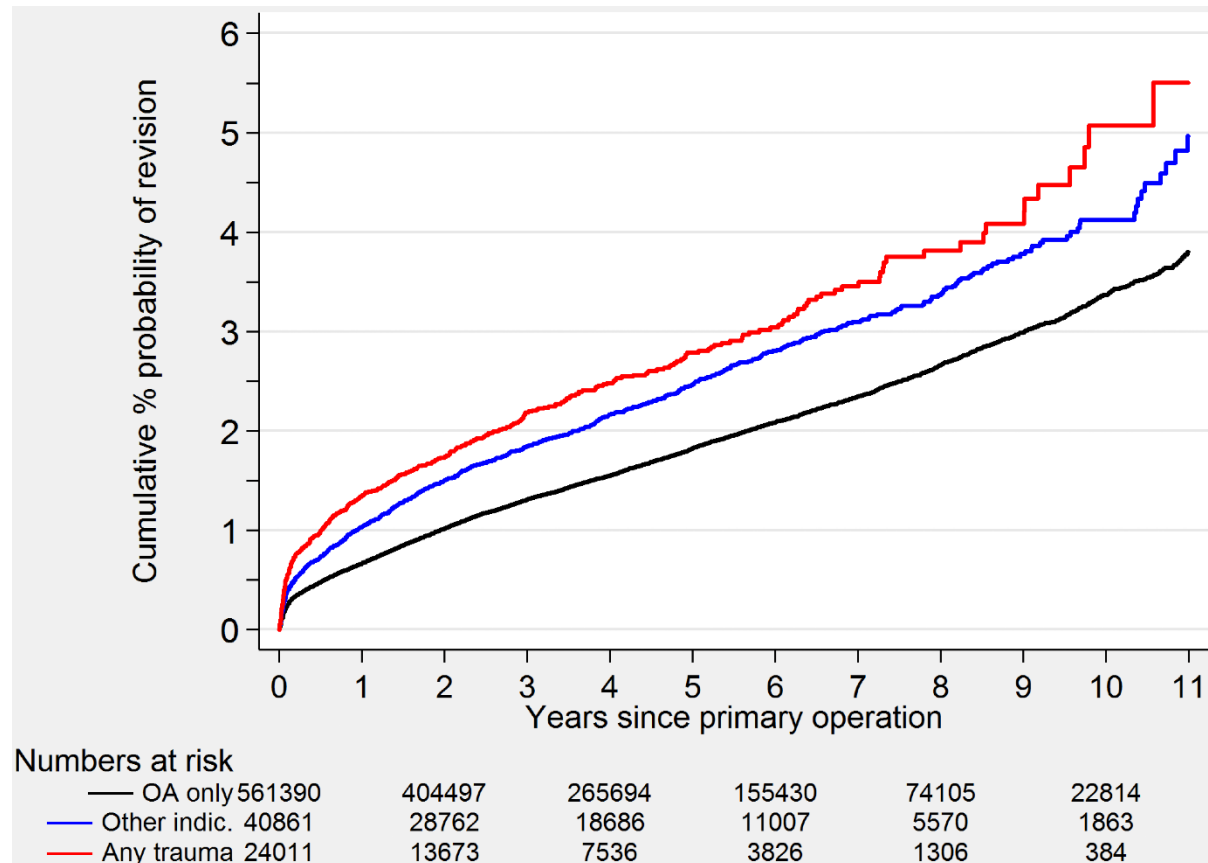


Fig. E-1
Graph showing the cumulative percentage probability of revision (Kaplan-Meier) for stemmed non-MoM THR implants, by reason for the primary operation (osteoarthritis [OA] only, other indications, or any trauma). The respective numbers at risk for revision at 0, 2, 4, 6, and 8 years after the primary operation are shown below the graph.

TABLE E-1 Relationship Between Patient Sex, Age, and Reason for Primary Operation

	Age at Primary Op.			
	<55 Yr	55-64 Yr	65-74 Yr	≥75 Yr
Males (<i>no.</i>)	26,519	54,311	89,015	67,932
Reason for primary op.				
OA only	19,282 (72.7%)	49,697 (91.5%)	83,736 (94.1%)	62,990 (92.7%)
Other reason	5,994 (22.6%)	3,245 (6.0%)	3,126 (3.5%)	2,456 (3.6%)
Any trauma	1,243 (4.7%)	1,369 (2.5%)	2,153 (2.4%)	2,486 (3.7%)
Females (<i>no.</i>)	33,603	75,751	141,329	137,483
Reason for primary op.				
OA only	24,003 (71.4%)	67,669 (89.3%)	129,771 (91.8%)	123,985 (90.2%)
Other reason	8,530 (25.4%)	5,403 (7.1%)	6,003 (4.2)	6,085 (4.4%)
Any trauma	1,070 (3.2%)	2,679 (3.5%)	5,555 (3.9%)	7,413 (5.4%)

TABLE E-2 Relationship Between Sex, Age, and Type of Fixation in Patients with Stemmed Non-MoM THR Implants

	Age at Primary Op.			
	<55 Yr	55-64 Yr	65-74 Yr	≥75 Yr
Males (<i>no.</i>)	26,520	54,317	89,022	67,936
Type of fixation				
Cemented	3,198 (12.1%)	11,983 (22.1%)	33,990 (38.2%)	35,045 (51.6%)
Uncemented	18,308 (69.0%)	31,510 (58.0%)	36,368 (40.9%)	18,468 (27.2%)
Hybrid	4,545 (17.1%)	9,522 (17.5%)	16,213 (18.2%)	12,510 (18.4%)
Reverse hybrid	469 (1.8%)	1,302 (2.4%)	2,451 (2.8%)	1,913 (2.8%)
Females (<i>no.</i>)	33,606	75,754	141,346	137,494
Type of fixation				
Cemented	4,909 (14.6%)	19,568 (25.8%)	61,294 (43.4%)	79,311 (57.7%)
Uncemented	21,621 (64.3%)	38,891 (51.3%)	48,630 (34.4%)	29,064 (21.1%)
Hybrid	6,434 (19.2%)	15,175 (20.0%)	27,118 (19.2%)	25,163 (18.2)
Reverse hybrid	642 (1.9%)	2,120 (2.8%)	4,304 (3.0%)	3,956 (2.9%)

TABLE E-3 First Revisions and Re-Revisions, by Implant Type

Group	First Revision by End of 2014	Re-Revision by End of 2014*
Stemmed non-MoM (n = 626,314)	10,562	968
Stemmed MoM (n = 32,024)	3,808	387
Resurfacing (n = 37,555)	3,201	307

*Re-revision work as defined in the 12th Annual Report of the NJR, published in 2015¹⁴.

TABLE E-4 Estimated Cumulative Percentage Risk of Re-Revision (Kaplan-Meier) for Each Implant Type, by Time Since First Revision

	Estimated Cumulative Percentage Risk (95% CI)		
	Stemmed Non-MoM (N = 10,562*)	Stemmed MoM (N = 3,808*)	Resurfacing (N = 3,201*)
Time since first revision			
1 yr	5.5 (5.0-5.9)	5.3 (4.6-6.1)	3.5 (2.9-4.2)
3 yr	9.7 (9.1-10.3)	10.9 (9.8-12.1)	7.5 (6.5-8.6)
5 yr	12.0 (11.3-12.9)	15.3 (13.6-17.1)	12.3 (10.8-14.0)
7 yr	14.9 (13.8-16.2)	19.8 (17.0-23.0)†	18.0 (5.7-20.7)
10 yr	18.4 (16.3-20.8)†	23.5 (17.7-30.8)†	31.5 (24.2-40.4)†

*Re-revision work as defined in the 12th Annual Report of the NJR, published in 2015¹⁴. †Fewer than 250 patients remained at risk for re-revision.

TABLE E-5 Reasons for First Revisions, by Implant Type

	Stemmed Non-MoM (N = 10,562*)	Stemmed MoM (N = 3,808*)	Resurfacing (N = 3,201*)
Aseptic loosening	2,832 (26.8%)	765 (20.1%)	680 (21.2%)
Pain	1,654 (15.7%)	984 (25.8%)	1,167 (36.5%)
Dislocation or subluxation	2,659 (25.2%)	214 (5.6%)	94 (2.9%)
Infection	1,937 (18.3%)	302 (7.9%)	149 (4.7%)
Periprosthetic fracture	1,533 (14.5%)	144 (3.8%)	333 (10.4%)
Malalignment	957 (9.1%)	188 (4.9%)	213 (6.7%)
Lysis	456 (4.3%)	236 (6.2%)	234 (7.3%)
Prosthetic wear	620 (5.9%)	141 (3.7%)	80 (2.5%)
Prosthetic fracture	387 (3.7%)	43 (1.1%)	78 (2.4%)
Prosthetic head-socket size mismatch	108 (1.0%)	20 (0.5%)	23 (0.7%)
Other indication	771 (7.3%)	587 (15.4%)	566 (17.7%)
Adverse reaction to particulate debris†	149/6,637 (2.2%)	757/1,661 (45.6%)	332/1,018 (32.6%)

*Total number of revisions through the end of 2014, with the percentage in parentheses. †Information only available for primary procedures performed from 2008 onward.

TABLE E-6 Main Reasons for Revision, by Time Since Primary Operation: Rate per 1,000 Implant-Years of Follow-up*

Reason for First Revision	Time Since Primary Op.	Rate per 1,000 Implant-Years (95% CI)		
		Stemmed Non-MoM THR	Stemmed MoM THR	MoM Resurfacing
Aseptic loosening	≤1 yr	1.06 (0.98-1.15)	2.53 (2.03-3.15)	2.42 (1.96-2.98)
	>1 to ≤3 yr	1.06 (1.00-1.13)	3.29 (2.86-3.77)	2.15 (1.83-2.52)
	>3 to ≤5 yr	0.91 (0.83-0.99)	3.98 (3.49-4.54)	3.06 (2.66-3.53)
	>5yr*	1.30 (1.21-1.39)	4.88 (4.32-5.51)	3.17 (2.80-3.59)
Pain	≤1 yr	0.64 (0.58-0.71)	1.77 (1.36-2.30)	2.04 (1.62-2.56)
	1 to ≤3 yr	0.71 (0.66-0.77)	3.51 (3.07-4.02)	4.05 (3.61-4.55)
	3 to ≤5 yr	0.53 (0.48-0.60)	6.34 (5.71-7.03)	5.66 (5.10-6.28)
	>5 yr	0.59 (0.53-0.65)	6.70 (6.04-7.43)	5.79 (5.28-6.34)
Dislocation/subluxation	≤1 yr	2.45 (2.32-2.58)	2.59 (2.09-3.22)	0.68 (0.46-1.01)
	1 to ≤3 yr	0.66 (0.61-0.72)	0.80 (0.61-1.06)	0.39 (0.27-0.56)
	3 to ≤5 yr	0.51 (0.46-0.57)	0.70 (0.51-0.95)	0.23 (0.13-0.38)
	>5 yr	0.61 (0.55-0.68)	0.82 (0.61-1.11)	0.35 (0.24-0.51)
Infection	≤1 yr	1.42 (1.33-1.52)	1.36 (1.01-1.83)	0.65 (0.44-0.97)
	1 to ≤3 yr	0.76 (0.70-0.81)	1.60 (1.31-1.95)	0.79 (0.60-1.03)
	3 to ≤5 yr	0.44 (0.39-0.50)	1.54 (1.24-1.90)	0.50 (0.35-0.71)
	>5 yr	0.31 (0.27-0.36)	1.40 (1.12-1.76)	0.49 (0.36-0.67)
Adverse reaction to particulate debris†	≤1 yr	0.11 (0.08-0.14)	0.36 (0.16-0.80)	0.29 (0.12-0.70)
	1 to ≤3 yr	0.11 (0.09-0.14)	4.85 (4.15-5.68)	3.27 (2.70-3.98)
	3 to ≤5 yr	0.09 (0.06-0.13)	13 (12-15)	6.35 (5.43-7.43)
	>5 yr	0.07 (0.03-0.15)	17 (15-20)	6.79 (5.37-8.58)

*The maximum duration of follow-up was 11.75 years. †Information only available for primary procedures performed from 2008 onward.