Bone & Joint Research

Supplementary Material

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Table i. Sources of variables used for model development.

Categories	Subcategories
Patient factors	Age
	Sex
	BMI
	ASA grade
	Side of operation
	Hospital type
Surgical factors	Operation type
	Diagnosis group
	Incision type
	Prosthesis group
	Cement type
Cup implant factors	Fixation
	Resurfacing
	Articulation
	Modular or monoblock
	Inner diameter
	Modification
Femoral implant factors	Fixation
	Stem resurfacing
	Articulation
	Head size
Outcomes	
Revision due to periprosthetic femoral fracture	30 days
	60 days
	90 days
	1 year
Reoperation due to periprosthetic femoral fracture	30 days
	60 days
	90 days
	1 year

Table ii. Variable definition list.

Variable	Definition	Data type
Age	The age of the patient at the time of primary or re-do procedure	Integer
ASA grade	The grade of ASA	Integer; values 1 to 5
BMI	BMI at the time of procedure	Decimal, converted to categorical in the studies for clinical relevance
Cement type	Cemented or cementless, and if cemented specify the type of cement used	Integer, around 100 classes exist in the SAR. Reclassified into five groups: cementless, antibiotic and high viscosity, antibiotic and low viscosity, no antibiotic and high viscosity, no antibiotic and low viscosity
Date	Date of primary or secondary procedure	Date time
Diagnosis group	Primary preoperative diagnosis	Integer; primary arthrosis, inflammatory, acute trauma hip fracture, childhood disease, idiopathic necrosis, complication after fracture or trauma, tumour, other secondary arthrosis, other acute traumas
Sex	Male or female	Integer
Hospital type	The type of hospital where procedure was undertaken	Integer: university, county, rural, or private
Incision type	Indicative of surgical approach	Integer, re-classified into five groups: posterior, direct lateral, direct anterior, trochanteric, other
Operation side	Right or left	Integer
Procedure type	Total or hemi hip arthroplasty	Integer
Prosthesis group	All-cemented, all-cementless, hybrid, reverse hybrid or resurfacing	Integer
Cup fixation	Refers to the method or mechanism used to secure or fixate the cup component of the hip prosthesis	Integer, classified into: cemented, cementless or resurfaced
Cup articulation	The material used for the cup articulation surface	Integer, classified into standard metal, resurfaced metal, ceramic, dual mobility (monoblock or modular), standard polyethylene, cross-linked polyethylene, unclear
Cup inner diameter	Refers to the size of the inner opening or bore of the cup component	Integer
Cup modification	Refers to alterations or adjustments made to the cup component	Integer, classified into: standard (non-modified), lipped, dual articular, constrained, unclear
Cup modularity	Refers to the design feature of the cup component, which can be detached	Integer, classified into modular or monoblock

	from other parts of the implant with a liner (modular), or a single, integrated piece without separable components (monoblock)	
Cup resurfacing	Whether the acetabulum was resurfaced with a cup-like component	Integer
Femoral head size	Refers to the diameter of the spherical-shaped top portion of the femoral head that articulates with the acetabular cup	Integer
Femoral fixation	Refers to the method or mechanism used to secure or fixate the stem component of the hip prosthesis	Integer, classified into: cemented, cementless or resurfaced
Femoral modularity	Refers to the design feature of the femoral component, which can be detached from other parts of the implant (modular), or a single, integrated piece without separable components (monoblock)	Integer, classified into modular or monoblock
Femoral resurfacing	Whether the femoral head was resurfaced with a stem-like component	Integer

ASA, American Society of Anesthesiologists; SAR, Swedish Arthroplasty Register.

Table iii. Summary and Kaplan-Meier estimates for the change in revision rates due to periprosthetic femoral fractures by year of primary operation. No statistically significant differences were identified across years.

Year	Total, n	30-day revision			60-day revision			90-day revision			1-year revision		
		N	KM, %	HR (95% CI)*	N	KM, %	HR (95% CI)*	N	KM, %	HR (95% CI)*	N	KM, %	HR (95% CI)*
2008	11,058	6	0.05	1.00	10	0.09	1.00	10	0.09	1.00	15	0.14	1.00
2009	13,026	16	0.12	2.26 (0.88 to 5.79)	18	0.14	1.53 (0.70 to 3.31)	20	0.15	1.69 (0.79 to 3.62)	32	0.25	1.80 (0.97 to 3.33)
2010	13,547	4	0.03	0.54 (0.15 to 1.93)	8	0.06	0.65 (0.25 to 1.66)	10	0.07	0.81 (0.34 to 1.96)	17	0.13	0.92 (0.46 to 1.85)
2011	13,699	10	0.07	1.33 (0.48 to 3.67)	15	0.11	1.20 (0.54 to 2.68)	19	0.14	1.52 (0.71 to 3.28)	21	0.15	1.12 (0.58 to 2.18)
2012	13,946	11	0.08	1.45 (0.53 to 3.94)	11	0.08	0.87 (0.37 to 2.06)	14	0.10	1.11 (0.49 to 2.50)	22	0.16	1.16 (0.60 to 2.23)
2013	13,987	15	0.11	1.98 (0.77 to 5.12)	19	0.14	1.51 (0.70 to 3.25)	22	0.16	1.74 (0.82 to 3.69)	31	0.22	1.63 (0.88 to 3.03)
2014	14,226	17	0.12	2.22 (0.87 to 5.65)	23	0.16	1.80 (0.86 to 3.79)	23	0.16	1.80 (0.85 to 3.78)	31	0.22	1.61 (0.87 to 2.98)
2015	14,410	12	0.08	1.54 (0.58 to 4.12)	22	0.15	1.70 (0.80 to 3.56)	24	0.17	1.84 (0.88 to 3.86)	27	0.19	1.38 (0.73 to 2.60)
2016	15,000	8	0.05	0.99 (0.34 to 2.85)	11	0.07	0.81 (0.34 to 1.92)	16	0.11	1.18 (0.53 to 2.60)	25	0.17	1.23 (0.65 to 2.34)
2017	15,515	9	0.06	1.08 (0.38 to 3.03)	10	0.06	0.71 (0.29 to 1.72)	14	0.09	1.00 (0.44 to 2.25)	19	0.12	0.91 (0.46 to 1.79)
2018	16,105	12	0.08	1.42 (0.53 to 3.78)	22	0.15	1.60 (0.75 to 3.38)	24	0.16	1.78 (0.85 to 3.74)	26	0.19	1.53 (0.81 to 2.89)

*Adjusted for age and sex.

HR, hazard ratio; KM, Kaplan-Meier.

Table iv. Summary and Kaplan-Meier estimates for the change in reoperation rates due to periprosthetic femoral fractures by year of primary operation. No statistically significant differences were identified across years.

Year	Total, n	30-day reoperation			60-day reoperation			90-day reoperation			1-year reoperation		
		N	KM estimate	HR (95% CI)*	N	KM estimate	HR (95% CI)*	N	KM estimate	HR (95% CI)*	N	KM estimate	HR (95% CI)*
2008	11,058	9	0.08	1.00	13	0.12	1.00	14	0.13	1.00	27	0.25	1.00
2009	13,026	19	0.15	1.79 (0.81 to 3.97)	24	0.18	1.57 (0.80 to 3.08)	26	0.20	1.57 (0.82 to 3.02)	48	0.37	1.50 (0.94 to 2.41)
2010	13,547	5	0.04	0.45 (0.15 to 1.35)	10	0.07	0.62 (0.27 to 1.43)	12	0.09	0.70 (0.32 to 1.51)	28	0.21	0.84 (0.49 to 1.43)
2011	13,699	11	0.08	0.98 (0.40 to 2.37)	17	0.12	1.05 (0.51 to 2.17)	24	0.18	1.38 (0.71 to 2.67)	33	0.24	0.98 (0.59 to 1.63)
2012	13,946	12	0.09	1.06 (0.44 to 2.52)	12	0.09	0.73 (0.33 to 1.61)	15	0.11	0.85 (0.41 to 1.76)	27	0.20	0.79 (0.46 to 1.35)
2013	13,987	16	0.11	1.41 (0.62 to 3.20)	21	0.15	1.28 (0.64 to 2.57)	24	0.17	1.36 (0.70 to 2.63)	38	0.27	1.11 (0.67 to 1.82)
2014	14,226	17	0.12	1.48 (0.66 to 3.33)	24	0.17	1.45 (0.73 to 2.85)	26	0.18	1.45 (0.75 to 2.78)	39	0.28	1.12 (0.68 to 1.83)
2015	14,410	13	0.09	1.12 (0.47 to 2.62)	26	0.18	1.54 (0.79 to 3.01)	28	0.20	1.54 (0.81 to 2.93)	37	0.26	1.05 (0.64 to 1.73)
2016	15,000	11	0.07	0.91 (0.37 to 2.19)	15	0.10	0.85 (0.40 to 1.80)	22	0.15	1.16 (0.59 to 2.27)	34	0.23	0.93 (0.56 to 1.54)
2017	15,515	12	0.08	0.96 (0.40 to 2.28)	15	0.10	0.83 (0.39 to 1.74)	20	0.13	1.02 (0.51 to 2.02)	27	0.18	0.71 (0.41 to 1.22)
2018	16,105	14	0.09	1.10 (0.47 to 2.55)	25	0.17	1.40 (0.72 to 2.75)	28	0.19	1.50 (0.79 to 2.85)	31	0.23	1.06 (0.63 to 1.78)

*Adjusted for age and sex.

HR, hazard ratio; KM, Kaplan-Meier.