

Supplementary Material

10.1302/2046-3758.125.BJR-2023-0281.R1

Table i. Risk of bias assessment.

Author, year	QUIPS Domain					
	Participants	Study attrition	PF measurement	Outcome measurement	Adjustment for other PFs	Statistical analysis and reporting
Baghdadi 2014		B4	C2, C6		E1, E6	F1, F2
Barco 2017		B1, B3	C1, C2, C5, C6	D1, D2	E1, E6, E7	F2, F3
Borton 2021	A1, A3, A6		C1, C2, C5, C6	D1, D2	E1, E2, E3, E5, E6, E7	F1, F2, F3
Fevang 2009	A5, A7	B2, B3	C3		E1, E4, E7	
Gay 2012	A5, A7	B1, B2, B3, B4, B5	C1, C2, C3, C5, C6	D1, D2	E1, E2, E3, E5, E6, E7	F1, F2
Griffin 2015	A4, A6	B1 - B5	C2, C4, C6	D1, D2, D3	E1 - E7	F1, F2, F3

Ikävalko 2010	A2, A5, A7	B1, B4, B5	C1, C2, C6	D2	E1, E5, E6	F1, F2
Kodama 2017	A1, A2, A4, A5, A6	B1 - B5	C1 - C6	D2, D3	E1-E6	F2, F3
Krukhaug 2018	A2, A5	B1 - B5	C2, C3, C4, C6	D2	E1, E5, E7	F2, F4
Perretta 2017		B1	C2, C6	D2	E1, E3, E5, E6	F2
Plaschke 2014	A5, A7	B2, B4, B5	C1, C2, C3, C6		E1, E3, E5, E6	F1, F2, F3
Poff 2022	A2, A4, A5	B1 - B5	C1 - C6	D1 - D3	E1 - E7	F1, F2, F3
Sanchez-Sotello 2016		B2, B4, B5	C1, C2, C3, C5, C6	D2	E3, E5	F1, F2
Schoni 2013		B1, B3, B4, B5	C1, C2, C5, C6		E1 - E7	F1, F2, F3
Shah 2000	A1, A2, A3, A5, A6, A7	B1 - B5	C2, C3, C5, C6	D2	E1, E3, E5, E6, E7	F1, F2, F4
Singh 2021	A1, A5, A6	B1	C2, C3, C4	D1 - D3	E1, E2, E4	
Skyttä 2009		B1 - B5	C6		E1, E6	F1, F2
Viswanath 2020		B1 - B5	C4, C6	D1	E1, E3, E4, E5, E6, E7	F1, F2
Viveen 2019		B2, B3, B5			E1, E3, E6, E7	F1, F2

Risk of bias domains were rated as moderate to high risk of bias if the criteria below are not met or if it is not clearly described (letters in each of the domain boxes indicate that the specific criterion was not met)

Table ii. Summary of synthesis of patient-related prognostic factors.

									Adapted GRADE criteria						
Prognostic factor	Author s	Effect measur e	Univariable		Multivariable		Time outcom e measur e	Variables adjusted for	Study limitations	Consistency	Directness	Precision	Publication bias	Effect size	Overall quality
			Effect size	95% CI	Effect size	95% CI									
Age (8 studies)									Serious	×	✓	×	×	S, M	+
Per year increase	Baghda di	HR	-	-	0.98	0.96-0.99		Diagnosis and sex	Serious	×	✓	✓	×	S	+
Per year increase	Perretta	OR	-	-	0.98	0.94-1.02		Diagnosis, implant, sex	Serious	×	✓	×	×	S	+
Per year increase	Schoni	Relative risk	-	-	0.98	NR		Diagnosis, other arthroplasties, prior surgery, sex, side	Very serious	×	✓	×	×	S	+
Per decade increase	Barco	HR	-	-	1.4	0.70-2.70		Diagnosis and sex	Serious	N/A	✓	×	×	S	+
≥ 60 years vs < 60	Plaschke	Relative risk (RR)	0.84	0.52-1.35	0.88	0.54-1.42		Diagnosis, sex, TER year	Serious	×	✓	×	×	S	+
≥ 60 years vs < 60	Krukhaug/ Fevang	Relative risk (HR)	0.68	0.50-0.93	0.80	0.46-1.40		Fixation type, elbow disease, implant type, sex, TER year	Serious	×	✓	×	×	S	+
< 50 years	Singh	OR	-	-	Ref	Ref		Ethnicity, diagnosis, race, sex	Serious						
50 to < 65			-	-	0.52	0.16–1.70				N/A	✓	×	×	S	+

65 to < 80			-	-	0.52	0.11-2.39				N/A	✓	×	×	S	+	
≥ 80			-	-	0.35	0.05-2.24				N/A	✓	×	×	M	+	
BMI (2 studies)										Very serious	✓	✓	×	×	S	+
Per unit increase	Baghda di	HR	-	-	1.02	0.99-1.05		Age, diagnosis, sex	Serious	N/A	✓	×	×	S	+	
< 30	Baghda di	HR	-	-	Ref	Ref		Age, diagnosis, sex	Serious							
30 - < 35			-	-	1.03	0.60-1.68				N/A	✓	×	×	S	+	
35 - < 40			-	-	3.08	1.61-5.45				N/A	✓	✓	×	S	+	
≥ 40			-	-	0.71	0.17-1.90				×	✓	×	×	S	+	
30-40 vs < 30	Griffin	OR	1.90	1.40-2.50	-	-	24 months	None	Very serious	N/A	✓	✓	×	S	+	
> 40 vs < 30	Griffin	OR	2.30	1.60-3.10	-	-	24 months		Very serious	×	✓	✓	×	S	+	
> 40 vs 30-40	Griffin	OR	1.20	0.80-1.80	-	-	24 months		Very serious	N/A	✓	×	×	S	+	
Diagnosis/Indication for TEA (9 studies)										Serious	Evidence varies between diagnoses					
Inflammatory	Baghda di	HR	-	-	Ref	Ref		Age, diagnosis, sex	Serious							
Trauma (acute or Sequelae)			-	-	3.48	2.34-5.27				✓	×	✓	×	M	++	
Other (OA, tumour, Charcot,			-	-	0.95	0.28-2.48				×	×	✓	×	M	+	

haemophilia, crystal, septic)															
Trauma with no RA	Barco	HR	Ref	Ref	Ref	Ref		Age, diagnosis, sex	Serious	N/A	✓	×	×	S	+
Trauma with RA			2.50	0.60-11.40	0.96	0.10-7.30									
RA	Gay	OR	-	-	1.7	NR		Not reported	Very serious	N/A	×	×	×	S	+
Other (OA, trauma, oncology)			-	-	Ref	Ref									
Inflammatory	Krukhaug	Relative risk (HR)	Ref	Ref	Ref	Ref		Age and sex	Serious						
Trauma Sequelae			2.00	1.12-3.58	1.86	1.10-3.41				✓	✓	✓	×	S	++
Osteoarthritis			0.78	0.35-1.78	0.73	0.30-1.80				×	✓	×	×	S	+
Acute fracture			1.68	0.68-4.13	-	-				N/A	✓	×	×	S	+
Other			0.95	0.39-2.33	-	-				N/A	✓	×	×	S	+
Inflammatory	Perretta	OR	-	-	Ref	Ref		Age, diagnosis, implant type, sex	Serious						
Trauma (acute or sequelae)			-	-	3.40	1.10-10.00				✓	×	✓	×	M	++
Other (OA/haemophilia)			-	-	0.19	0.02-2.20				×	×	×	×	L	+
RA	Plaschke	Relative risk (RR)	Ref	Ref	Ref	Ref		Age, TEA year, sex	Serious						
Trauma sequelae			2.03	1.23-3.66	1.90	1.05-3.44				✓	✓	✓	×	S	++

< 15 years	Kodama		-	-	7.54	1.25-45.70		Interval between RA and TEA, pre-operative ROM	Very serious	N/A	×	×	×		
Ethnicity (1 study)									Serious	N/A	✓	×	×	S, M	+
White	Singh	OR	-	-	Ref	Ref		Age, ethnicity, indication for TEA, race, sex	Serious						
Black			-	-	1.05	0.22–5.01				N/A	✓	×	×	S	+
Hispanic			-	-	1.08	0.37–3.18				N/A	✓	×	×	S	+
Other/Missing			-	-	0.55	0.18–1.73				N/A	✓	×	×	M	+
Income category (1 study)									Serious	N/A	✓	×	×	S	+
0-25th percentile	Singh	OR	-	-	1.19	0.35–4.05		Age, ethnicity, indication for TEA, race, sex	Serious	N/A	✓	×	×	S	+
25th-50th percentile			-	-	1.04	0.32–3.37				N/A	✓	×	×	S	+
50th-75th percentile			-	-	1.34	0.43–4.16				N/A	✓	×	×	S	+
75th-100th percentile			-	-	Ref	Ref									
The Deyo-Charlson score / Morbidity (1 study)									Serious	N/A	✓	×	×	S	+
0	Singh	OR	-	-	Ref	Ref		Age, ethnicity, indication for TEA, race, sex	Serious						
1			-	-	2.23	0.91–5.48				N/A	✓	×	×	S	+

≥ 2			-	-	1.45	0.35–6.02				N/A	✓	×	×	S	+	
Preoperative flexion/extension arc ROM (1 study)										Very serious	N/A	×	×	×	L	+
< 85°	Kodama	OR	-	-	Ref	Ref		Interval between RA and TEA, preoperative ROM	Very serious	N/A	×	×	×	L	+	
≥ 85°			-	-	12.72	2.06-78.74										
Previous corticosteroids use (1 study)										Very serious	N/A	✓	×	×	M	+
Corticosteroids use	Schoni	Relative risk	-	-	Ref	Ref		Age, diagnosis, other arthroplasties, prior surgery, sex, side	Very serious	N/A	✓	×	×	M	+	
No corticosteroids use			-	-	2.79	NR										
Previous elbow surgery (1 study)										Very serious	N/A	✓	×	×	M	+
No previous elbow surgery	Schoni	Relative risk	-	-	Ref	Ref		Age, diagnosis, other arthroplasties, prior surgery, sex, side	Very serious	N/A	✓	×	×	M	+	
Previous elbow surgery			-	-	2.55	NR										
Prior elbow trauma (1 study)										Serious	N/A	✓	×	×	S	+
No prior elbow trauma	Sanchez-Sotelo	HR	-	-	Ref	Ref		Age, BMI, prior elbow surgery, sex, year of TEA	Serious	N/A	✓	×	×	S	+	
Prior elbow trauma			-	-	2.46	1.12-4.97										
Sex (8 studies)										Serious	×	✓	×	×	S	++
Female vs male	See Figure 3 (Main text)									Serious	×	✓	×	×	S	++

Female	Schoni	Relative risk	-	-	Ref	Ref		Age, diagnosis, other arthroplasties, prior surgery, sex, and side	Very serious	N/A	✓	✗	✗	S	+
Male			-	-	1.34	NR									

CI, confidence interval; GRADE, Grading of Recommendations, Assessment, Development, and Evaluations; HR, hazard ratio; N/A, not applicable; NR, not reported; OR, odds ratio; RA, rheumatoid arthritis; ROM, range of motion; RR, risk ratio; TEA, total elbow arthroplasty.

+: Very low evidence, ++: Low quality evidence, +++: Moderate quality evidence, ++++: High quality evidence

Effect sizes classed as 1) small if measures (OR/HR/RR/relative risk) are between: 0.41-1.00 or 1.00-2.49; 2) moderate if measures are between 0.24-0.40 or 2.5-4.24; and 3) large if measures are between 0-0.23 or ≥ 4.25 (based on guidance from Huguet et al¹). S, Small, M, Medium, L, Large

Table iii. Summary of synthesis of implant-related prognostic factors.

Prognostic factor	Authors	Effect measure	Univariable		Multivariable		Time outcome measured	Variables adjusted for	Adapted GRADE criteria						
			Effect size	95% CI	Effect size	95% CI			Study limitations	Consistency	Directness	Precision	Publication	Effect Size	Overall
Implant design (3 studies)									Serious	✓	✓	×	×	S, M	+
Linked	Krukhaug	Relative risk (HR)	0.66	0.42-1.05	-	-		Age, diagnosis, sex, and TEA year	Serious	×	✓	×	×	S	+
Unlinked			Ref	Ref	-	-									
Linked	Plaschke	Relative risk (RR)	Ref	Ref	Ref	Ref		Diagnosis, sex, and TEA year	Serious	×	✓	✓	×	S	+
Unlinked			1.57	0.92-2.70	1.88	1.10-3.20									
Linked	Viveen	HR	-	-	Ref	Ref	0-6 months	Age and sex	Not serious	×	✓	×	×	M	+
Unlinked			-	-	3.70	0.90-15.60									
Linked	Viveen	HR	-	-	Ref	Ref	> 6 months	Age and sex	Not serious	×	✓	×	×	S	+
Unlinked			-	-	0.80	0.20-2.40									
Implant type (6 studies)									Serious	Evidence varies between implants					
Norway			Ref	Ref	0.6	0.3-1.2			Serious	N/A	✓	×	×	S	+

Discovery	Krukhaug/ Fevang	Relative risk (HR)	1.01	0.49-2.09	NR	NR		Age, fixation type, previous elbow disease, sex, and TEA year		N/A	✓	×	×	S	+
Kudo			1.18	0.63-2.18	Ref	Ref			N/A	✓	×	×	S	+	
IBP			2.34	1.34-4.09	2.6	0.84-8.08			N/A	✓	×	×	S	+	
GSB-3			0.97	0.41-2.29	0.55	0.07-4.70			N/A	✓	×	×	S	+	
NES			3.20	1.88-6.12	4.70	1.20-18.20			N/A	✓	✓	×	L	+	
Cemented Norway	Krukhaug	Relative risk (HR)	-	-	Ref	Ref		Age and sex	Serious	N/A	✓	✓	×	S	+
Cemented NES			-	-	2.31	1.23-4.35									
Cemented Discovery	Krukhaug	Relative risk (HR)	-	-	Ref	Ref		Age and sex	Serious	N/A	✓	✓	×	S	+
Hybrid IBP			-	-	2.17	1.01-4.64									
Norway	Krukhaug	Relative risk (HR)	-	-	Ref	Ref	First 10 years	Age and sex	Serious	N/A	✓	✓	×	S	+
IBP			-	-	2.34	1.34-3.09									
Discovery	Krukhaug	Relative risk (HR)	-	-	Ref	Ref	First 10 years	Age and sex	Serious	N/A	✓	×	×	S	+
Norway			-	-	1.01	0.49-2.09									
Cemented Norway	Krukhaug		-	-	Ref	Ref	First 10 years	Age and sex	Serious	N/A	✓	×	×	S	+

Cemented Kudo		Relative risk (HR)	-	-	1.37	0.68-2.73										
Cemented Norway	Krukhaug	Relative risk (HR)	-	-	Ref	Ref	After 10 years	Age and sex	Serious							
Cemented Kudo			-	-	2.58	1.16-5.76				N/A	✓	✓	×	M	+	
Cemented NES			-	-	2.57	1.29-5.10				N/A	✓	✓	×	M	+	
Discovery	Perretta	OR	-	-	Ref	Ref		Age, diagnosis, implant, and sex	Serious							
Capitellocondylar			-	-	1.50	0.39-5.60				N/A	✓	×	×	S	+	
Coonrad-Morrey			-	-	5.90	1.30-27.00				N/A	✓	×	×	L	+	
Souter Strathclyde	Plaschke	Relative risk (RR)	Ref	Ref	Ref	Ref		Age, diagnosis, sex, and TEA year	Serious							
Coonrad-Morrey			0.67	0.32-1.38	0.49	0.20-1.22				N/A	✓	×	×	S	+	
GSB III			0.46	0.21-1.01	0.42	0.19-0.94				N/A	✓	✓	×	S	+	
Capitellocondylar			0.49	0.23-1.04	0.5	0.23-1.10				N/A	✓	×	×	S	+	
Souter Strathclyde	Skyttä	RR	-	-	Ref	Ref		Age and sex	Serious							
Coonrad-Morrey			-	-	0.7	0.3-1.3				N/A	✓	×	×	S	+	

NES/Norway			-	-	1.1	0.4-2.07				N/A	✓	×	×	S	+	
IBP/Kudo			-	-	0.9	0.3-1.3				N/A	✓	×	×	S	+	
Latitude	Viswanath	HR	-	-	Ref	Ref		Age, diagnosis, sex, and surgeon volume	Very serious	N/A	✓	×	×	M	+	
Coonrad-Morrey			-	-	0.33	0.16-0.66										
Linked Latitude	Viswanath	HR	Ref	Ref	-	-		None	Very serious	N/A	✓	×	×	M	+	
Coonrad-Morrey			0.29	0.13-0.65	-	-										
Unlinked Latitude	Viswanath	HR	Ref	Ref	-	-		None	Very serious	N/A	✓	×	×	M	+	
Coonrad-Morrey			0.27	0.12-0.62	-	-										
Unlinked Latitude Without RH	Viswanath	HR	Ref	Ref	-	-		None	Very serious	N/A	✓	×	×	M	+	
Coonrad-Morrey			0.35	NR	-	-										
Fixation type (1 study)									Very serious	N/A	✓	×	×	S, M	+	
Cemented	Krukhaug	Relative risk (HR)	Ref	Ref	-	-		None	Very serious							
Uncemented			3	1.56-5.75	-	-					N/A	✓	✓	×	M	+
Hybrid			1.18	0.81-1.71	-	-					N/A	✓	×	×	S	+
Missing			0.42	0.06-3.02	-	-					N/A	✓	×	×	S	+

Fixation of the ulnar component (1 study)									Serious	N/A	✓	✓	×	M	+
Cemented	Krukhaug	Relative risk (HR)	Ref	Ref	Ref	Ref		Age and sex	Serious	N/A	✓	✓	×	M	+
Uncemented			2.43	1.28-4.62	2.98	1.55-5.72									
Type of surface finish of the ulnar component (1 study)									Serious	N/A	✓	×	×	S-L	+
Modern plasma spray	Sanchez-Sotelo	HR	Ref	Ref	-	-		None	Serious						
Beaded porous coating			1.06	0.23-7.46	-	-				N/A	✓	×	×	S	+
Early plasma spray coating			1.05	0.05-11.28	-	-				N/A	✓	×	×	S	+
PMMA pre-coated			4.57	1.27-29.23	-	-				N/A	✓	✓	×	L	+
Beaded porous coating	Sanchez-Sotelo	HR	Ref	Ref	-	-		None	Serious	N/A	✓	×	×	M	+
PMMA pre-coated			4.34	0.87-79.11	-	-									
Ulnar implant design for Souter Strathclyde (1 study)									Serious	N/A	×	✓	×	S, L	+
Metal-backed	Ikävalko	RR	-	-	Ref	Ref		Age and sex	Serious						
All-polyethylene small			-	-	28.20	3.80-206.90				N/A	×	✓	×	L	+
All-polyethylene medium			-	-	8.40	1.03-68.80				N/A	×	✓	×	L	+

Retentive	Ikävalko	RR	-	-	Ref	Ref	Age and sex	Serious	N/A	×	✓	×	S	+	
Non-retentive			-	-	2.40	1.20-4.70									
Humerus implant design for Souter Strathclyde (1 study)									Serious	N/A	×	✓	×	S-L	+
Long stem medium primary	Ikävalko	RR	-	-	Ref	Ref	Age and sex	Serious							
Short stem small primary			-	-	5.60	2.20-13.90				N/A	×	✓	×	L	+
Short stem medium primary			-	-	3.60	1.40-9.10				N/A	×	✓	×	M	+
Any revision			-	-	2.30	0.50-11.40				N/A	×	×	×	S	+
If a radial head implant was used (1 study)									Not serious	N/A	✓	×	×	S	+
TEA without RH	Viveen	HR	-	-	Ref	Ref	Age and sex	Not serious	N/A	✓	×	×	S	+	
TEA with RH			-	-	1.50	0.70-2.90									
CI, confidence interval; GRADE: Grading of Recommendations, Assessment, Development, and Evaluations; GSB, Gschwend/Scheier/Bähler; HR, hazard ratio; IBP, instrumented bone preserving; N/A, not applicable; NES, Norway Elbow System; NR, not reported; OR, odds ratio; RH, radial head; RR, risk ratio; TEA, total elbow replacement.															
+: Very low evidence, ++: Low quality evidence, +++: Moderate quality evidence, ++++: High quality evidence															
Effect sizes classed as 1) small if measures (OR/HR/RR/relative risk) are between: 0.41-1.00 or 1.00-2.49; 2) moderate if measures are between 0.24-0.40 or 2.5-4.24; and 3) large if measures are between 0-0.23 or ≥ 4.25 (based on guidance from Hugué et al ¹).															

Table iv. Summary of synthesis of surgical factors and other related prognostic factors.

								Adapted GRADE criteria							
Prognostic factor	Study	Effect measure	Univariable		Multivariable		Time outcome measure	Variables adjusted for	Study limitations	Consistency	Directness	Precision	Publication	Effect size	Overall
			Effect size	95% CI	Effect size	95% CI									
Surgical factors (subsequent surgical procedures) (1 study)									Very serious	N/A	✓	×	×	S	+
No	Schoni	Relative Risk	-	-	Ref	Ref		Age, diagnosis, other arthroplasties, prior surgery, sex, side	Very serious	N/A	✓	×	×	S	+
Yes			-	-	1.74	NR									
Surgical factors (humerus implant positioning of Souter Strathclyde based on postoperative radiograph measurement) (1 study)									Very serious	N/A	×	×	×	S-M	+
Increased Hlat3*	Shah	HR	-	-	0.35	NR		Hlat 3 Hap3 Hap1	Very serious	N/A	×	×	×	M	+
Increased Hap1*	Shah	HR	-	-	1.72	NR		Hlat 3 Hap3 Hap1	Very serious	N/A	×	×	×	S	+
Increased Hap3*	Shah	HR	-	-	0.66	NR		Hlat 3 Hap3 Hap1	Very serious	N/A	×	×	×	S	+
Hospital factors (hospital type) (1 study)									Serious	N/A	✓	✓	×	S	+
Specialized	Skyttä	RR	-	-	Ref	Ref		Age, sex	Serious	N/A	✓	✓	×	S	+

Other			-	-	1.5 0	1.10-2.20										
Hospital factors (hospital volume: TEA per year) (1 study)									Very serious	N/A	✓	×	×	S-L	+	
1-5 vs ≥ 18	Poff	OR	1	0.99-1.01	-	-	3 months	None	Very serious	N/A	✓	×	×	S	+	
6-17 vs ≥ 18	Poff	OR	1.007	1.004-1.011	-	-	3 months		Very serious	N/A	✓	×	×	S	+	
1-5 vs 6-17	Poff	OR	0.15	0.05-0.45	-	-	3 months		Very serious	N/A	✓	×	×	L	+	
Q1 vs Q4	Poff	OR	0.33	0.07-1.65	-	-	3 months		Very serious	N/A	✓	×	×	M	+	
Q2 vs Q4	Poff	OR	0.33	0.07-1.64	-	-	3 months		Very serious	N/A	✓	×	×	M	+	
Q3 vs Q4	Poff	OR	1.83	0.67-4.95	-	-	3 months		Very serious	N/A	✓	×	×	S	+	
Q1 vs Q3	Poff	OR	0.18	0.04-0.82	-	-	3 months		Very serious	N/A	✓	×	×	L	+	
Q2 vs Q3	Poff	OR	0.18	0.04-0.82	-	-	3 months		Very serious	N/A	✓	×	×	L	+	
Q1 vs Q2	Poff	OR	1	0.14-7.13	-	-	3 months		Very serious	N/A	✓	×	×	S	+	
Surgeon factors (surgeon volume) (1 study)									Very serious	N/A	✓	×	×	M	+	
≥ 20 TEAs	Gay	OR	-	-	Ref	NR	NR	NR		N/A				M	+	

0-19 TEAs			-	-	2.8	NR			Very serious		✓	×	×		
Other (insurance status in the USA) (1 study)									Serious	N/A	✓	×	×	S, M	+
Private	Singh	OR	-	-	Ref	Ref		Age, diagnosis, sex	Serious						
Medicaid			-	-	3.54	0.80-15.71				N/A	✓	×	×	M	+
Medicare			-	-	3.23	0.70-15.02				N/A	✓	×	×	M	+
Other			-	-	0.71	0.07-7.09				N/A	✓	×	×	S	+
Self			-	-	2.12	0.20-23.15				N/A	✓	×	×	S	+
Other (time period in which TEA was performed) (3 studies)									Serious	N/A	✓	×	×	S	+
1994-1999	Krukhaug	Relative risk (HR)	Ref	Ref	-	-		None	Serious						
2000-2005			1.31	0.91-1.89	-	-				N/A	✓	×	×	S	+
2006-2010			1.27	0.78-2.06	-	-				N/A	✓	×	×	S	+
2011-2016			1.04	0.46-2.35	-	-				N/A	✓	×	×	S	+
1981-1990	Plaschke	Relative risk (RR)	Ref	Ref	-	-		None	Serious						

1991-2000			0.94	0.49-1.81	-	-				N/A	✓	×	×	S	+
2001-2008			0.77	0.36-1.63	-	-				N/A	✓	×	×	S	+
1982-1993	Skyttä	RR	-	-	Ref	Ref		Age, sex, implant type	Serious	N/A	✓	✓	×	S	+
1994-2006			-	-	0.60	0.40-0.80									

CI, confidence interval; GRADE: Grading of Recommendations, Assessment, Development, and Evaluations; HR, hazard ratio; N/A, not applicable; NR, not reported; OR, odds ratio; Q1-Q4, first to fourth quartiles; RR, risk ratio; TEA, total elbow arthroplasty.

* These are radiograph measurements. Hlat = horizontal distance between the tip of humeral prosthesis and the anterior humeral cortex; Hap1= horizontal distance between medial edge of humeral prosthesis and medial epicondyle; Hap3 = perpendicular distance between lateral edge of humeral component and distal end of lateral epicondyle.

+: Very low evidence, ++: Low quality evidence, +++: Moderate quality evidence, ++++ High quality evidence

Effect sizes classed as 1) small if measures (OR/HR/RR/relative risk) are between: 0.41-1.00 or 1.00-2.49; 2) moderate if measures are between 0.24-0.40 or 2.5-4.24; and 3) large if measures are between 0-0.23 or ≥ 4.25 (based on guidance from Huguet et al¹). S, Small, M, Medium, L, Large

Study participation

- A1 = Population is adequately described
- A2 = The sampling frame and recruitment are adequately described
- A3 = Period of recruitment is adequately described
- A4 = Place of recruitment are adequately described
- A5 = Inclusion and exclusion criteria are adequately described
- A6 = There is adequate participation in the study by eligible individuals
- A7 = The baseline study sample is adequately described for key characteristics

Study attrition

- B1 = Response rate is adequate (<80%)
- B2 = Attempts to collect information on participants who dropped out
- B3 = Reasons for loss to follow-up are provided
- B4 = Participants lost to follow-up are adequately described for
- B5 = No important differences between participants who completed the study and those who did not

Prognostic factor (PF) measurement

- C1 = A clear definition or description of 'PF' is provided
- C2 = Method of PF measurement is adequately valid and reliable
- C3 = Continuous variables are reported, or appropriate cut-points are used.
- C4 = Method and setting of measurement of PF is the same for all study participants
- C5 = Adequate proportion of the study sample has complete data for PF variable
- C6 = Appropriate methods of imputation are used for missing 'PF' data

Outcome measurement

- D1 = A clear definition is provided
- D2 = Outcome measurement is adequately valid and reliable
- D3 = The method and setting of outcome measurement is the same for all participants

Adjustment for other prognostic factors (PFs)

- E1 = All-important PFs are measured.
- E2 = Clear definitions of the important PFs measured are provided
- E3 = Measurement of all important PFs is adequately valid and reliable
- E4 = The method and setting of PF measurement are the same for all study participants
- E5 = Appropriate methods are used to deal with missing data for PFs such if multiple imputation
- E6 = Important potential PFs are accounted for in the study design
- E7 = Important potential PFs are accounted for in the analysis (i.e., appropriate adjustment)

Statistical analysis and reporting

- F1 = There is sufficient presentation of data to assess the adequacy of the analysis.
- F2 = The strategy for model building is appropriate and based on a conceptual framework/model
- F3 = The selected statistical model is adequate for the design of the study
- F4 = There is no selective reporting of results

References

1. **Huguet A, Hayden JA, Stinson J, et al.** Judging the quality of evidence in reviews of prognostic factor research: adapting the GRADE framework. *Syst Rev.* 2013;2:71.