Australian Orthopaedic Association National Joint Replacement Registry

2024 SUPPLEMENTARY REPORT

Patient Reported Outcome Measures (PROMs): Hip, Knee and Shoulder Arthroplasty

AOA
AUSTRALIAN ORTHOPAEDIC ASSOCIATION

Australian Orthopaedic Association National Joint Replacement Registry

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Patient Reported Outcome Measures Hip, Knee and Shoulder Arthroplasty

2024 Supplementary Report

Clinical Director: Professor Paul Smith
E: admin@aoanjrr.org.au

Executive Manager: Ms Kathy Hill
E: khill@aoanjrr.org.au

AOANJRR
SAHMRI Building
North Terrace
ADELAIDE SA 5000
T: +61 8 8128 4280

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The Registry acknowledges the ongoing support of all hospitals, both public and private, that undertake arthroplasty surgery nationally. The support provided by each hospital through their nominated coordinator(s) is appreciated. A complete list of participating hospitals and coordinators is presented at the end of the Hip, Knee and Shoulder Arthroplasty Annual Report.

The Registry greatly appreciates the participation of all joint replacement patients throughout Australia. Their contribution allows ongoing improvements in arthroplasty outcomes to be achieved.

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Jacinta De Silva Anna Fergusson Vivien Do
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ICT
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Introduction

Patient reported outcome measures (PROMs) are surveys that assess dimensions of health from the perspective of the patient. These are additional joint replacement outcomes that are reported directly by patients through a bespoke electronic data capture system. PROMs data collection commenced with a pilot study in September 2017.[1] The system is currently being implemented nationally in all hospitals undertaking joint replacement surgery.

Several different instruments are used to collect data on patients' quality of life and joint-specific pain, function, and recovery. This year, PROMs data are reported for primary total hip, primary total knee, primary stemmed anatomic shoulder and primary total stemmed reverse shoulder replacement undertaken for osteoarthritis (OA), and primary reverse total shoulder replacement undertaken for rotator cuff arthropathy.

The data are presented overall for each category of joint replacement as well as for the two shoulder diagnoses assessed, and their variations by age and gender. Individual surgeon and individual hospital (both de-identified) pre-operative quality of life and joint-specific scores are also reported for primary total hip, primary total knee, and primary total stemmed reverse shoulder replacement only as the most common/frequent procedure groups.

The 2024 Patient Reported Outcome Measures Hip, Knee and Shoulder Arthroplasty Supplementary Report is based on the analysis of procedures using prostheses that were

available and used in 2023 (described as modern prostheses) with a procedure date up to and including 31 December 2023. These include 32,859 pre-operative and 23,826 post-operative PROMs for primary total hip procedures performed for osteoarthritis, 52,472 pre-operative and 37,108 post-operative PROMs for primary total knee procedures for osteoarthritis and 3,366 pre-operative and 2,263 post-operative PROMs for primary total stemmed anatomic and primary total stemmed reverse shoulder procedures performed for osteoarthritis and rotator cuff arthropathy.

The Patient Reported Outcome Measures Hip, Knee and Shoulder Arthroplasty Supplementary Report is one of 14 supplementary reports to complete the AOANJRR Annual Report for 2024.

The 2024 Annual Report, Supplementary Reports, and investigations of prostheses with higher than anticipated rates of revision are available on the AOANJRR website.

Information on the background, purpose, aims, benefits and governance of the Registry can be found in the Introduction of the 2024 Hip, Knee and Shoulder Arthroplasty Annual Report.

The Registry data quality processes including data collection, validation and outcomes assessment, are provided in detail in the data quality section of the 2024 Hip, Knee and Shoulder Arthroplasty Annual Report: https://aoanjrr.sahmri.com/annual-reports-2024.

[1] https://aoanjrr.sahmri.com/proms-pilot-report

PROMS INSTRUMENTS

The list of instruments used for AOANJRR PROMs collection are provided in Table SPR1.

The Oxford Hip Score, Oxford Knee Score and Oxford Shoulder Score are standardised and validated PROM instruments developed to assess joint-specific function and pain in patients undergoing total joint replacement surgery.

HOOS-12 and KOOS-12 results are not presented in this report, as they are administered as optional measures.

More detail about the PROMs instruments can be found in AOA PROMs Pilot Project Final Report: https://aoanjrr.sahmri.com/proms-pilot-report.

Table SPR1 Data Captured in the Minimum Dataset for PROMs Collection

Measurement Tool	Scoring	Applied to Hip (H), Knee (K) or Shoulder (S)
EQ-5D (Quality of Life)		
Usual activities	5 response options	H, K, S
Mobility	5 response options	H, K, S
Pain	5 response options	H, K, S
Depression / Anxiety	5 response options	H, K, S
Quality of life	5 response options	H, K, S
EQ-VAS (general health rating)	0-100	H, K, S
Oxford Hip Score	0-48	H
Oxford Knee Score	0-48	K
Oxford Shoulder Score	0-48	S
HOOS-12		H (optional)
KOOS-12		K (optional)
Joint-specific pain (last 7 days)	0-10	H, K, S
Low back pain (last 7 days)	0-10	H, K
Neck pain (last 7 days)	0-10	S
Expectation for pain, 6 months post-surgery	0-10	H, K, S
Expectation for mobility, 6 months post-surgery	5 categories	H, K, S
Expectation for health, 6 months post-surgery	0-100	H, K, S
Pre-operative patient-reported coincidental issues walking	Yes/No	H, K
Pre-operative patient-reported problems with the contralateral side	Yes/No	H, K, S
Satisfaction with the results of the procedure	5 categories	H, K, S
Improvement (in problems with joint compared to before surgery)	5 categories	H, K, S

Hip Summary

PATIENT CHARACTERISTICS

EQ-VAS and EQ-5D-5L

The EQ-VAS and EQ-5D-5L are measures of quality of life. EQ-VAS is a measure of patient reported health, and ranges from 0 (worst health imaginable) to 100 (best health imaginable). Pre-operative and 6 months post-operative scores after total hip replacement are shown in Figure SPR1. The mean EQ-VAS score increased by almost 15 points following hip replacement (Table SPR2). The change in the distribution of EQ-VAS responses following surgery is shown in Figure SPR1. The percentage of patients who reported being better, worse or no different post-operatively compared to their pre-operative response for each of the EQ-5D-5L domains is shown in Figure SPR2.

Females aged <65 years have a slightly lower mean pre-operative EQ-VAS, but all groups have similar mean post-operative scores at 6 months after surgery (Table SPR3 and Figure SPR3).

The pre-operative mean EQ-VAS decreases with increasing ASA score, but the improvement in each group is similar (Table SPR4 and Figure SPR4).

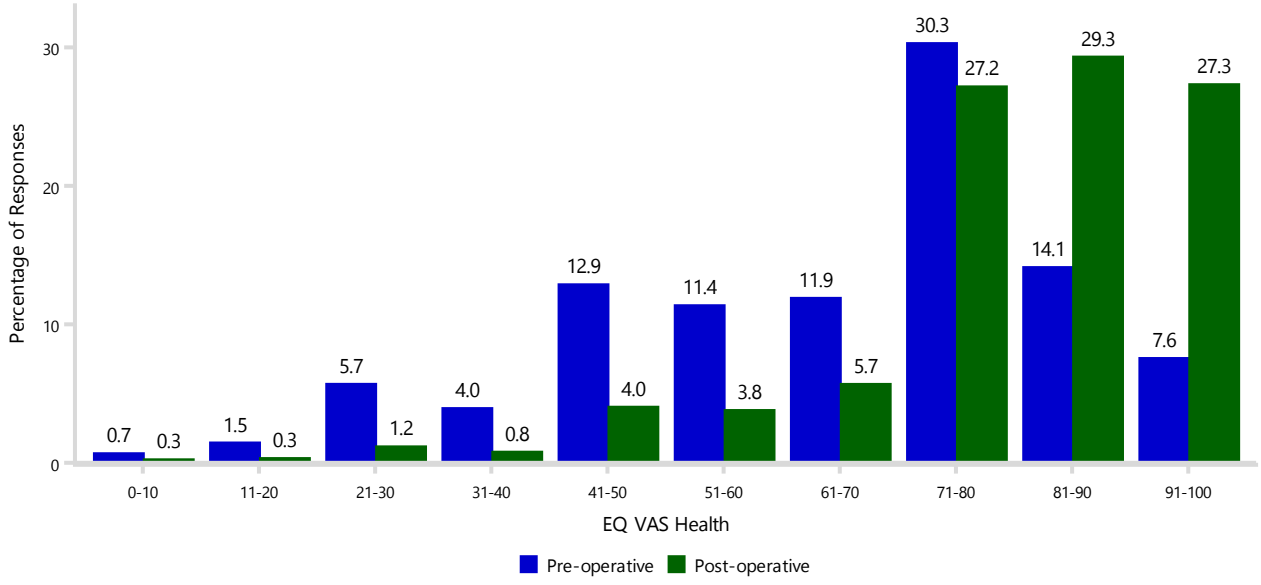
The mean pre-operative EQ-VAS assessment decreases with each increase in BMI category, apart from the underweight group where the number for assessment is small but post-operative improvements are similar (Table SPR5 and Figure SPR5).

Table SPR2 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Conventional	32271	66.10±20.01	72.00 (51.00, 80.00)	23433	81.05±15.69	85.00 (75.00, 91.00)

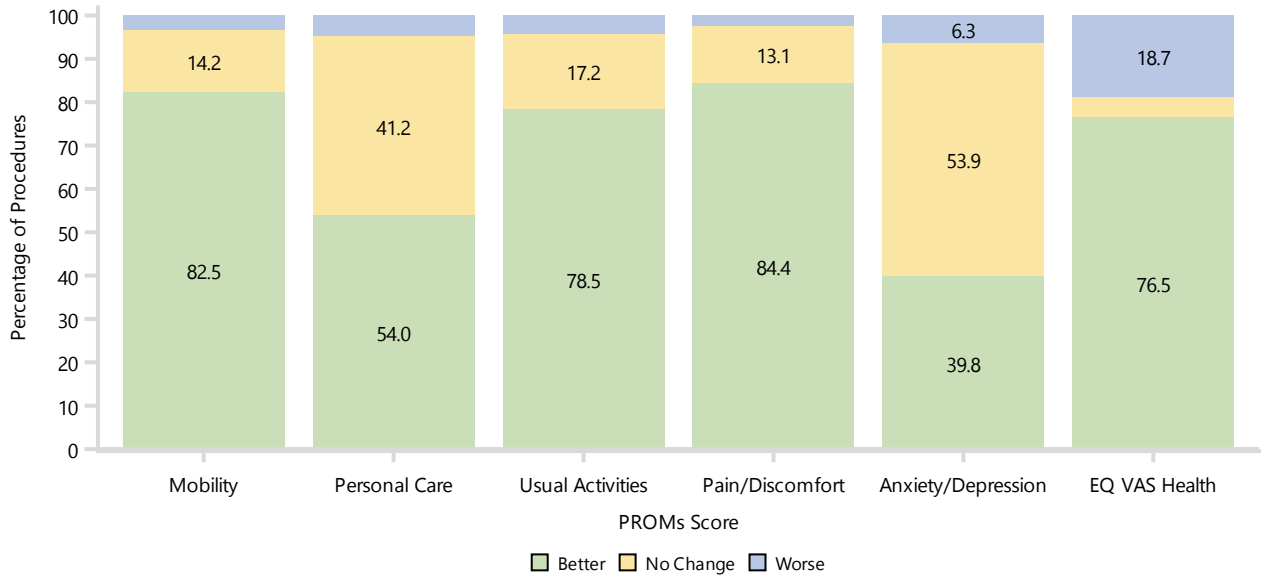
Note: Restricted to modern prostheses

Figure SPR1 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Figure SPR2 Change in EQ-5D-5L Domain Score and EQ-VAS Health in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)



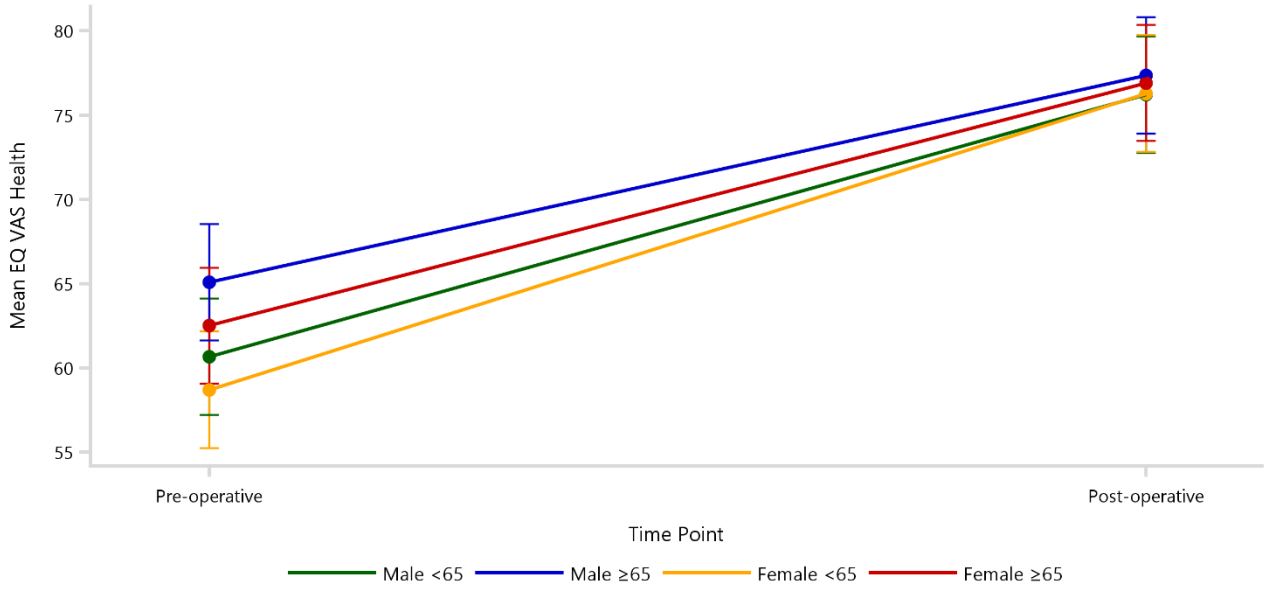
Note: Restricted to modern prostheses

Table SPR3 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	<65	6609	60.65 (57.19, 64.11)	4643	76.22 (72.77, 79.68)	15.57 (15.01, 16.13)
	≥65	8221	65.08 (61.62, 68.54)	6056	77.36 (73.91, 80.81)	12.28 (11.78, 12.77)
Female	<65	6211	58.70 (55.23, 62.16)	4532	76.28 (72.82, 79.74)	17.58 (17.02, 18.15)
	≥65	11230	62.50 (59.06, 65.95)	8202	76.90 (73.46, 80.35)	14.40 (13.98, 14.82)

Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Figure SPR3 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)



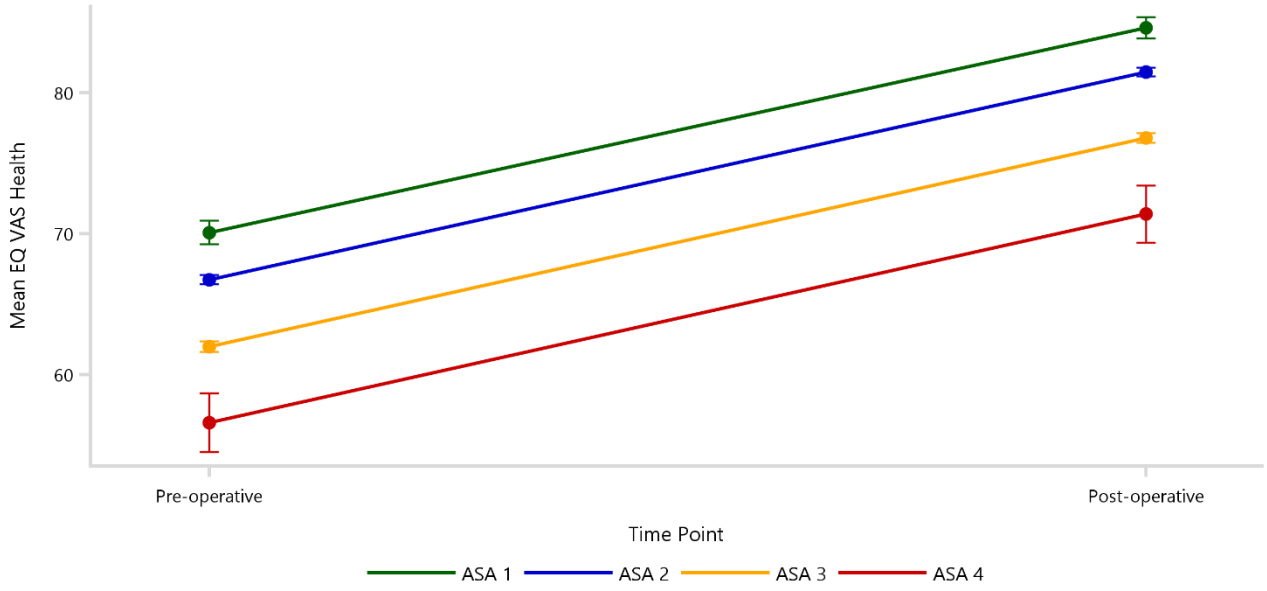
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Table SPR4 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 1	2355	70.08 (69.25, 70.91)	1757	84.59 (83.83, 85.34)	14.50 (13.59, 15.42)
ASA 2	17696	66.74 (66.40, 67.07)	13176	81.45 (81.14, 81.76)	14.71 (14.38, 15.05)
ASA 3	11833	61.99 (61.63, 62.35)	8255	76.77 (76.43, 77.11)	14.78 (14.36, 15.20)
ASA 4	341	56.59 (54.52, 58.67)	216	71.39 (69.37, 73.41)	14.79 (12.24, 17.35)

Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Figure SPR4 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by ASA Score (Primary Diagnosis OA)



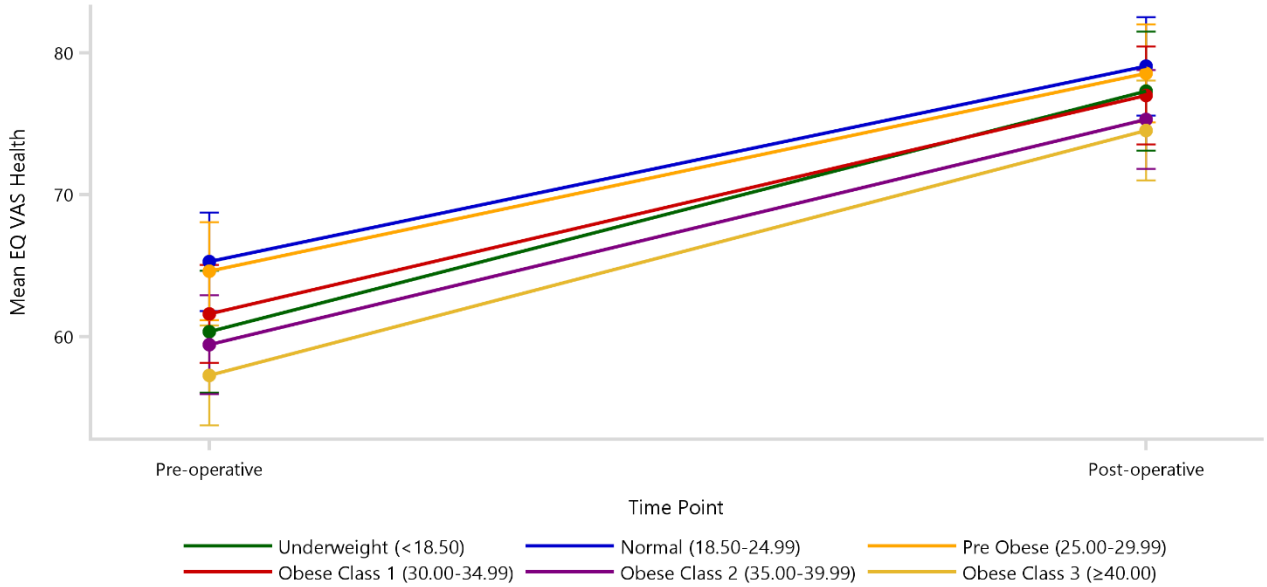
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Table SPR5 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Underweight (<18.50)	219	60.33 (56.04, 64.62)	152	77.28 (73.09, 81.47)	16.95 (13.89, 20.02)
Normal (18.50-24.99)	6400	65.26 (61.80, 68.73)	4684	79.04 (75.58, 82.50)	13.78 (13.22, 14.34)
Pre Obese (25.00-29.99)	11471	64.59 (61.14, 68.04)	8433	78.53 (75.08, 81.98)	13.94 (13.52, 14.36)
Obese Class 1 (30.00-34.99)	8438	61.58 (58.12, 65.04)	6104	76.99 (73.54, 80.45)	15.41 (14.92, 15.90)
Obese Class 2 (35.00-39.99)	3705	59.41 (55.92, 62.90)	2620	75.29 (71.81, 78.78)	15.88 (15.14, 16.63)
Obese Class 3 (≥40.00)	1788	57.26 (53.73, 60.79)	1269	74.51 (71.00, 78.02)	17.25 (16.18, 18.32)

Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients ≤19 years

Figure SPR5 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by BMI Category (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients ≤19 years

Oxford Scores

The Oxford Hip Score (OHS) is a joint specific assessment of pain and function. The OHS totals the responses from 12 questions, each on a 5-level scale of 0 (worst possible score) to 4 (best possible score). The mean pre-operative OHS is 21 and this improves to 41.5 post-operatively (Table SPR6). The minimal clinically important change in the OHS for a single group of patients is 12 points. The minimal important difference between groups of patients is 5 points.

Similar to the EQ-VAS, females aged <65 years have the lowest pre-operative OHS but all groups have similar improvements with males having slightly higher scores post-operatively (Table SPR7 and Figure SPR6).

The pre-operative mean OHS decreases with increasing ASA score, but the improvement in each group is similar (Table SPR8 and Figure SPR7).

The mean pre-operative OHS decreases with each increase in BMI category, apart from the underweight group where the number for assessment is small, but post-operative improvements are similar. Patients in obese class 3 have the largest change (Table SPR9 and Figure SPR8).

Table SPR6 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Conventional	32274	20.99±9.02	21.00 (14.00, 27.00)	23471	41.50±7.18	44.00 (39.00, 47.00)

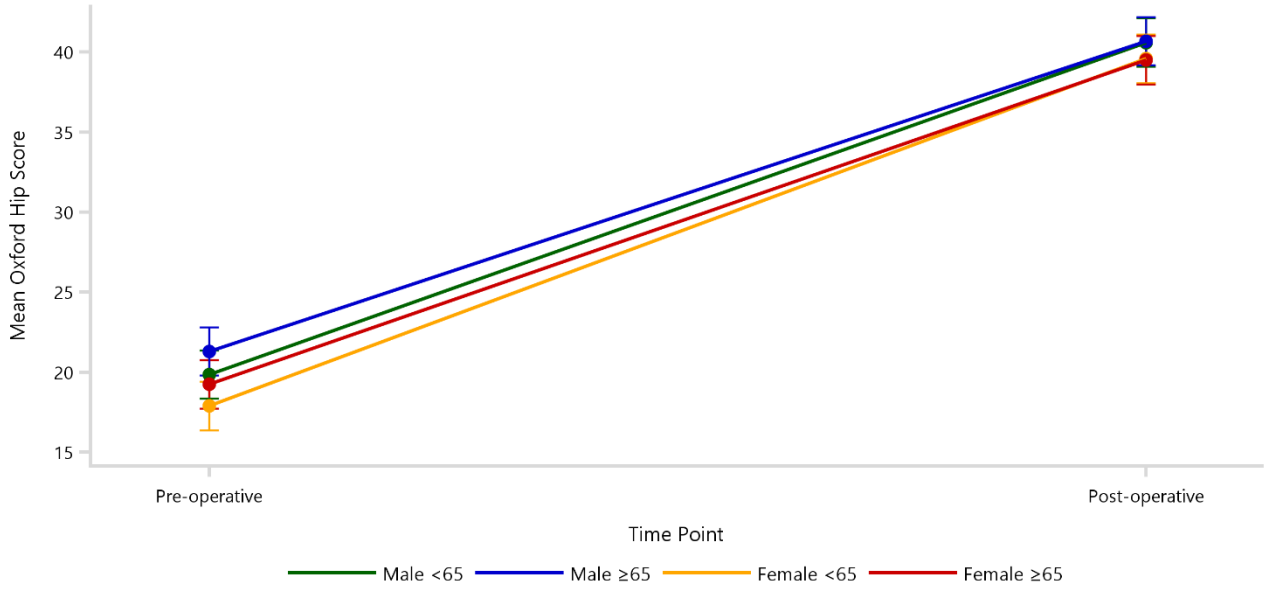
Note: Restricted to modern prostheses

Table SPR7 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	<65	6610	19.84 (18.33, 21.36)	4642	40.59 (39.08, 42.10)	20.74 (20.48, 21.01)
	≥65	8215	21.29 (19.78, 22.80)	6089	40.66 (39.15, 42.17)	19.37 (19.14, 19.61)
Female	<65	6219	17.89 (16.37, 19.40)	4522	39.58 (38.06, 41.09)	21.69 (21.42, 21.96)
	≥65	11230	19.23 (17.72, 20.74)	8218	39.48 (37.98, 40.99)	20.25 (20.05, 20.45)

Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Figure SPR6 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)



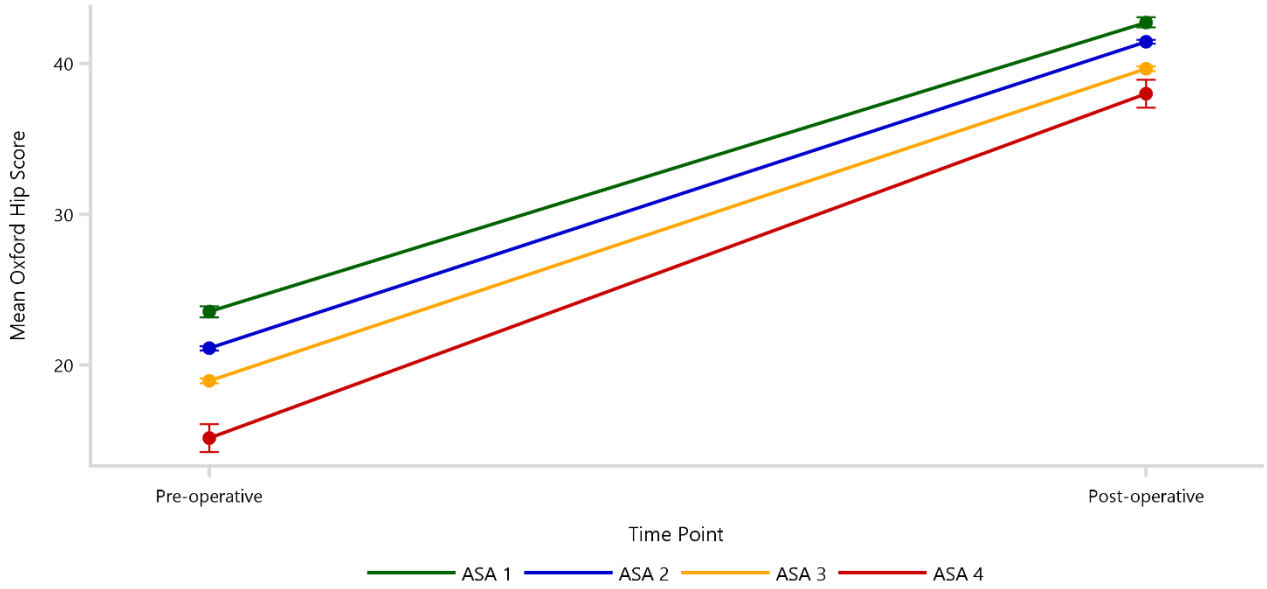
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Table SPR8 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 1	2361	23.53 (23.16, 23.89)	1762	42.73 (42.38, 43.07)	19.20 (18.77, 19.63)
ASA 2	17689	21.11 (20.96, 21.25)	13204	41.44 (41.30, 41.58)	20.34 (20.18, 20.50)
ASA 3	11840	18.94 (18.78, 19.10)	8259	39.65 (39.50, 39.81)	20.71 (20.51, 20.91)
ASA 4	339	15.14 (14.21, 16.06)	218	37.99 (37.06, 38.92)	22.85 (21.65, 24.05)

Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category

Figure SPR7 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by ASA Score (Primary Diagnosis OA)



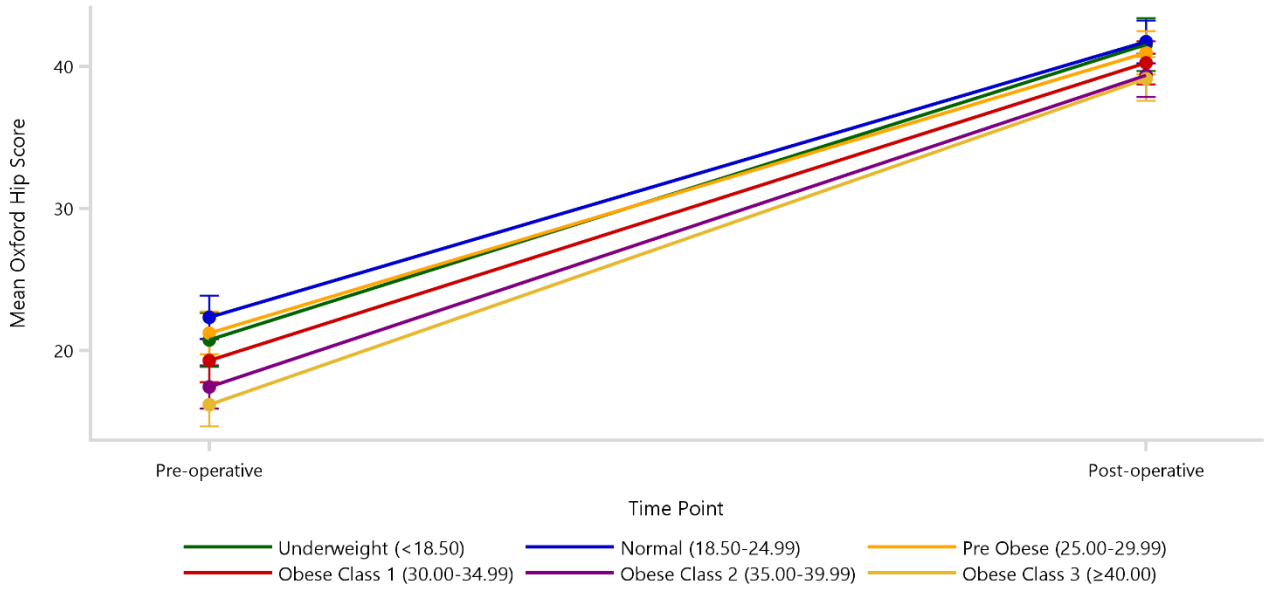
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category

Table SPR9 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Underweight (<18.50)	215	20.74 (18.85, 22.63)	154	41.53 (39.67, 43.39)	20.79 (19.35, 22.23)
Normal (18.50-24.99)	6395	22.34 (20.83, 23.86)	4707	41.72 (40.20, 43.23)	19.38 (19.11, 19.64)
Pre Obese (25.00-29.99)	11489	21.24 (19.73, 22.74)	8453	40.96 (39.45, 42.47)	19.72 (19.53, 19.92)
Obese Class 1 (30.00-34.99)	8430	19.31 (17.79, 20.82)	6101	40.25 (38.74, 41.76)	20.95 (20.72, 21.18)
Obese Class 2 (35.00-39.99)	3695	17.44 (15.92, 18.97)	2619	39.37 (37.85, 40.89)	21.93 (21.58, 22.28)
Obese Class 3 (≥40.00)	1796	16.21 (14.67, 17.76)	1267	39.12 (37.58, 40.65)	22.90 (22.40, 23.40)

Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years

Figure SPR8 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by BMI Category (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years

Patient Satisfaction and Change

Patients were surveyed at 6 months post-operatively on how satisfied they were with their primary hip replacement, and on their perceived change in their hip after surgery. Overall, satisfaction after hip replacement is very high. There are 91.9% of patients who are either very satisfied or satisfied (Table SPR10).

Age and gender have minimal effect on the proportion of patients who are satisfied (Table SPR11 and Figure SPR9).

There is a high percentage (96.7%) of patients who rate their hip as much better or a little better (Table SPR12).

Patient-reported change by age and gender are presented in Table SPR13 and Figure SPR10. There were no differences observed by age or gender.

Table SPR10 Procedure Satisfaction in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)

Class	Very Satisfied		Satisfied		Neutral		Dissatisfied		Very Dissatisfied		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Conventional	17863	76.3	3650	15.6	990	4.2	444	1.9	474	2.0	23421	100.0

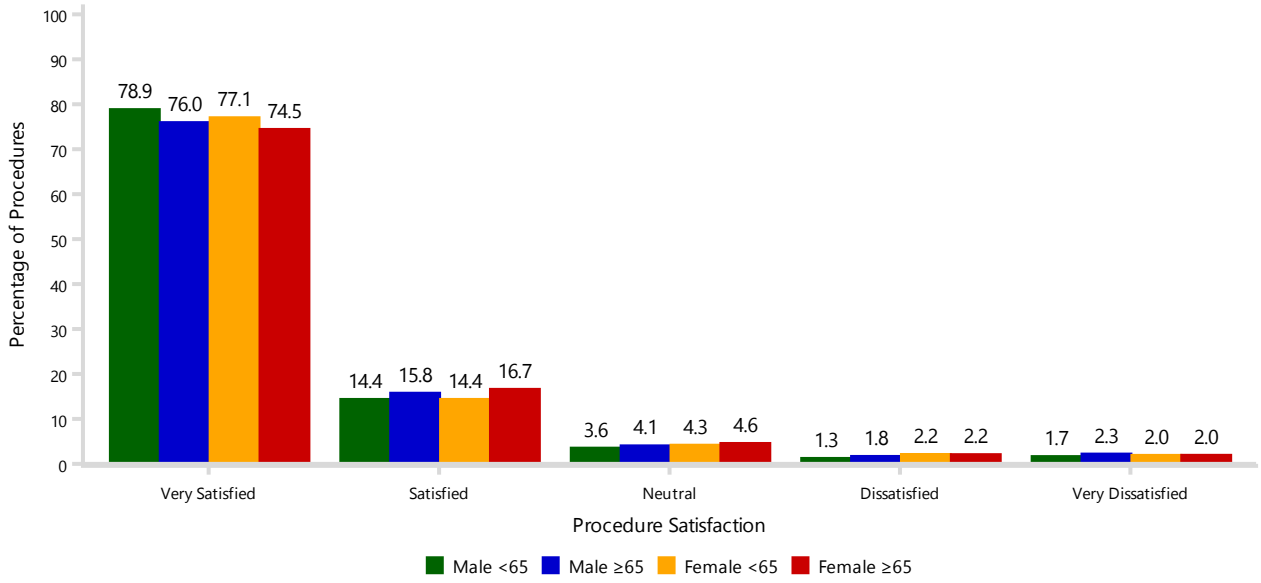
Note: Restricted to modern prostheses

Table SPR11 Procedure Satisfaction in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
		N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Male	<65	3656	78.9	20.5	669	14.4	18.3	167	3.6	16.9	61	1.3	13.7	80	1.7	16.9	4633	100.0	19.8
	≥65	4622	76.0	25.9	962	15.8	26.4	250	4.1	25.3	107	1.8	24.1	139	2.3	29.3	6080	100.0	26.0
Female	<65	3475	77.1	19.5	651	14.4	17.8	192	4.3	19.4	99	2.2	22.3	90	2.0	19.0	4507	100.0	19.2
	≥65	6110	74.5	34.2	1368	16.7	37.5	381	4.6	38.5	177	2.2	39.9	165	2.0	34.8	8201	100.0	35.0
TOTAL		**17863**	**76.3**	**100.0**	**3650**	**15.6**	**100.0**	**990**	**4.2**	**100.0**	**444**	**1.9**	**100.0**	**474**	**2.0**	**100.0**	**23421**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR9 Procedure Satisfaction in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Table SPR12 Patient-Reported Change in Primary Total Conventional Hip Replacement (Primary Diagnosis OA)

Class	Much Better		A Little Better		About the Same		A Little Worse		Much Worse		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Conventional	21554	92.0	1104	4.7	401	1.7	195	0.8	162	0.7	23416	100.0

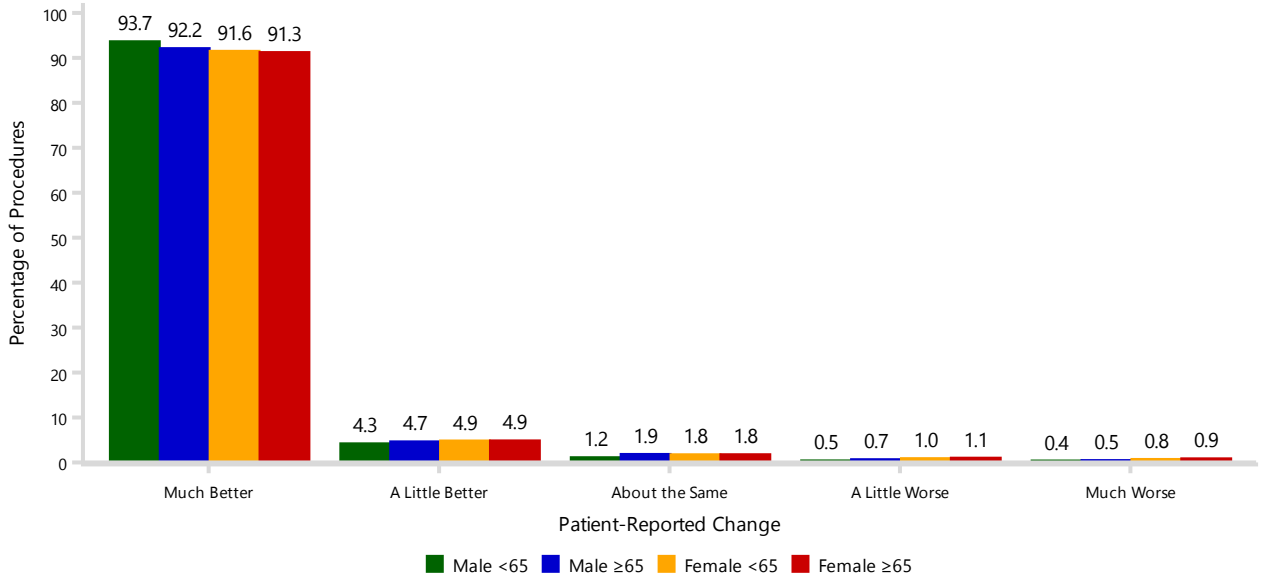
Note: Restricted to modern prostheses

Table SPR13 Patient-Reported Change in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
		N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Male	<65	4341	93.7	20.1	197	4.3	17.8	54	1.2	13.5	21	0.5	10.8	20	0.4	12.3	4633	100.0	19.8
	≥65	5602	92.2	26.0	285	4.7	25.8	115	1.9	28.7	44	0.7	22.6	32	0.5	19.8	6078	100.0	26.0
Female	<65	4126	91.6	19.1	220	4.9	19.9	82	1.8	20.4	43	1.0	22.1	35	0.8	21.6	4506	100.0	19.2
	≥65	7485	91.3	34.7	402	4.9	36.4	150	1.8	37.4	87	1.1	44.6	75	0.9	46.3	8199	100.0	35.0
TOTAL		**21554**	**92.0**	**100.0**	**1104**	**4.7**	**100.0**	**401**	**1.7**	**100.0**	**195**	**0.8**	**100.0**	**162**	**0.7**	**100.0**	**23416**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR10 Patient-Reported Change in Primary Total Conventional Hip Replacement by Gender and Age (Primary Diagnosis OA)



Note: Restricted to modern prostheses

PROSTHESIS CHARACTERISTICS

Femoral Fixation

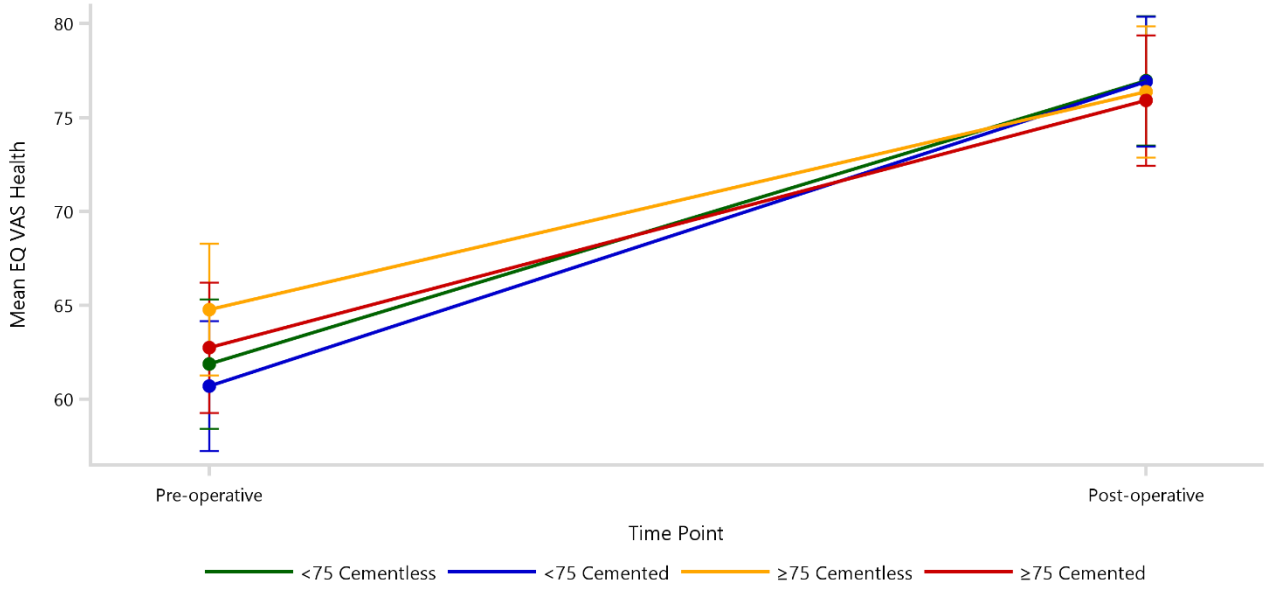
PROMs scores have also been analysed with respect to the method of femoral fixation when only cementless acetabular inserts were used. When patient age was considered for change in EQ-VAS there was no difference (Table SPR14 and Figure SPR11). There were no differences in the pre- to post-operative change in OHS scores with regards to age and femoral fixation (Table SPR15 and Figure SPR12). Satisfaction and patient-reported change were similar for both cemented and cementless femoral fixation irrespective of age (Table SPR16, Figure SPR13, Table SPR17 and Figure SPR14).

Table SPR14 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)

Age	Femoral Fixation	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<75	Cementless	17079	61.87 (58.43, 65.31)	12410	76.95 (73.52, 80.39)	15.08 (14.74, 15.42)
	Cemented	7266	60.70 (57.24, 64.16)	5446	76.91 (73.46, 80.37)	16.22 (15.69, 16.74)
≥75	Cementless	2973	64.77 (61.27, 68.27)	2124	76.36 (72.87, 79.85)	11.59 (10.76, 12.42)
	Cemented	4403	62.75 (59.28, 66.22)	3041	75.90 (72.43, 79.36)	13.15 (12.46, 13.84)

Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

Figure SPR11 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)



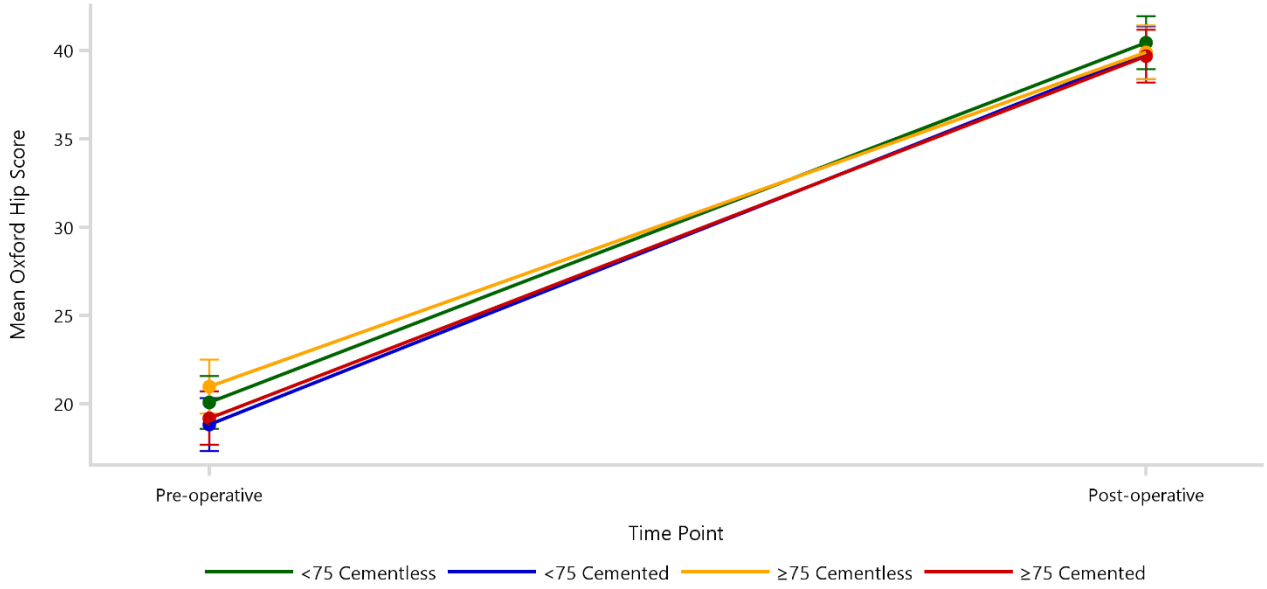
Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

Table SPR15 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)

Age	Femoral Fixation	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<75	Cementless	17065	20.08 (18.58, 21.57)	12427	40.45 (38.96, 41.95)	20.37 (20.21, 20.54)
	Cemented	7266	18.82 (17.32, 20.32)	5446	39.88 (38.38, 41.38)	21.06 (20.81, 21.31)
≥75	Cementless	2983	20.97 (19.45, 22.49)	2129	39.90 (38.38, 41.42)	18.93 (18.54, 19.32)
	Cemented	4410	19.19 (17.68, 20.70)	3053	39.69 (38.18, 41.19)	20.50 (20.17, 20.82)

Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

Figure SPR12 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)



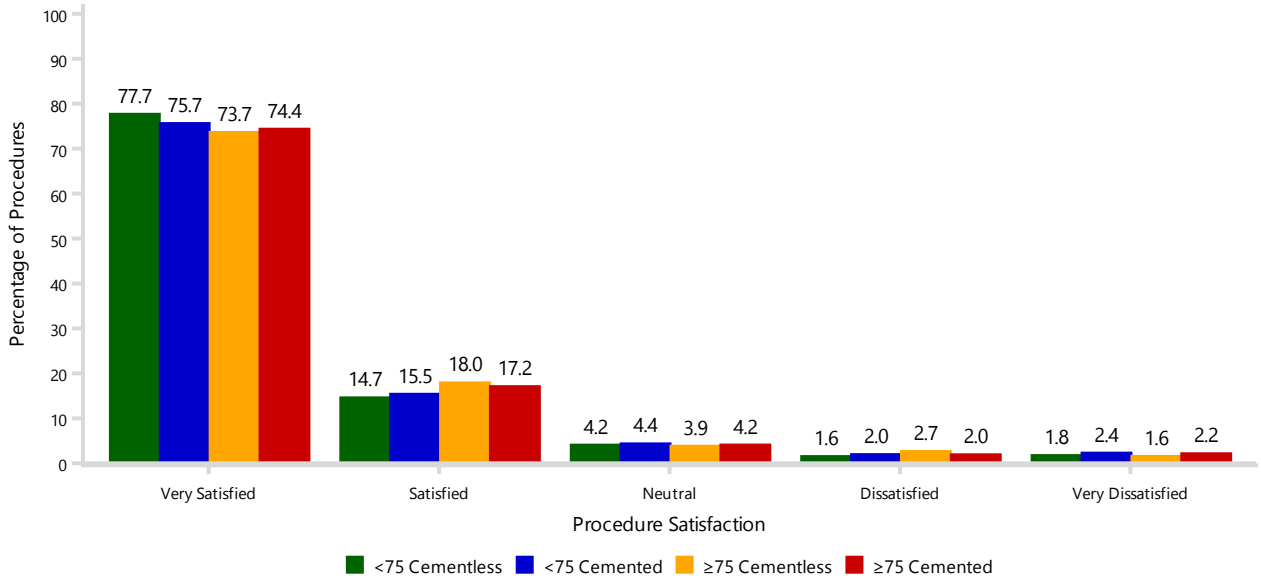
Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

Table SPR16 Procedure Satisfaction in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)

Age	Femoral Fixation	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
		N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
<75	Cementless	9640	77.7	54.8	1818	14.7	51.0	515	4.2	53.3	199	1.6	46.4	227	1.8	49.5	12399	100.0	53.9
	Cemented	4116	75.7	23.4	841	15.5	23.6	241	4.4	24.9	111	2.0	25.9	129	2.4	28.1	5438	100.0	23.6
≥75	Cementless	1564	73.7	8.9	382	18.0	10.7	83	3.9	8.6	58	2.7	13.5	35	1.6	7.6	2122	100.0	9.2
	Cemented	2268	74.4	12.9	523	17.2	14.7	127	4.2	13.1	61	2.0	14.2	68	2.2	14.8	3047	100.0	13.2
TOTAL		**17588**	**76.4**	**100.0**	**3564**	**15.5**	**100.0**	**966**	**4.2**	**100.0**	**429**	**1.9**	**100.0**	**459**	**2.0**	**100.0**	**23006**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR13 Procedure Satisfaction in Primary Total Conventional Hip Replacement with Cementless Acetabular Fixation by Age and Femoral Fixation (Primary Diagnosis OA)



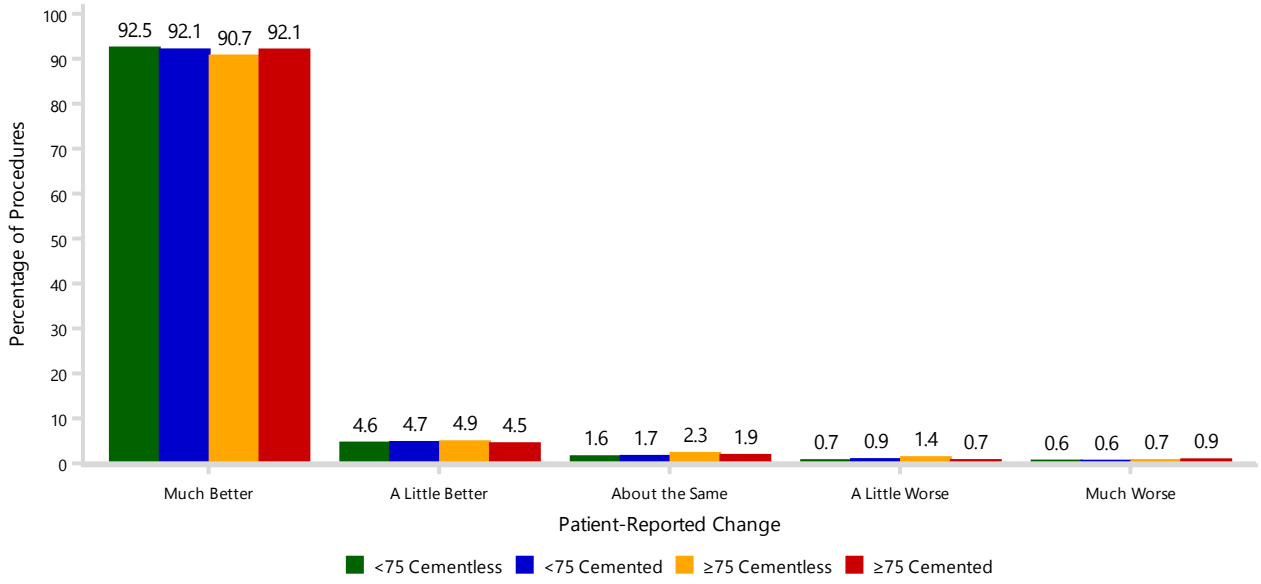
Note: Restricted to modern prostheses

Table SPR17 Patient-Reported Change in Primary Total Conventional Hip Replacement with Cementless Acetabular Component by Age and Femoral Fixation (Primary Diagnosis OA)

Age	Femoral Fixation	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
		N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
<75	Cementless	11465	92.5	54.1	572	4.6	53.5	195	1.6	49.9	87	0.7	46.0	76	0.6	50.7	12395	100.0	53.9
	Cemented	5007	92.1	23.6	258	4.7	24.1	90	1.7	23.0	51	0.9	27.0	32	0.6	21.3	5438	100.0	23.6
≥75	Cementless	1925	90.7	9.1	104	4.9	9.7	49	2.3	12.5	29	1.4	15.3	15	0.7	10.0	2122	100.0	9.2
	Cemented	2804	92.1	13.2	136	4.5	12.7	57	1.9	14.6	22	0.7	11.6	27	0.9	18.0	3046	100.0	13.2
TOTAL		**21201**	**92.2**	**100.0**	**1070**	**4.7**	**100.0**	**391**	**1.7**	**100.0**	**189**	**0.8**	**100.0**	**150**	**0.7**	**100.0**	**23001**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR14 Patient-Reported Change in Primary Total Conventional Hip Replacement with Cementless Acetabular Component by Age and Femoral Fixation (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Surgical Approach

Patient-reported outcomes for the three commonly performed surgical approaches for primary total hip replacement were analysed. The anterior approach has slightly higher pre- and post-operative mean EQ-VAS scores, but the change in score after surgery is similar for each approach (Table SPR18 and Figure SPR15). There were similar findings for the OHS (Table SPR19 and Figure SPR16).

There is a similar proportion of patients who were very satisfied or satisfied when comparing the three surgical approaches (Table SPR20 and Figure SPR17).

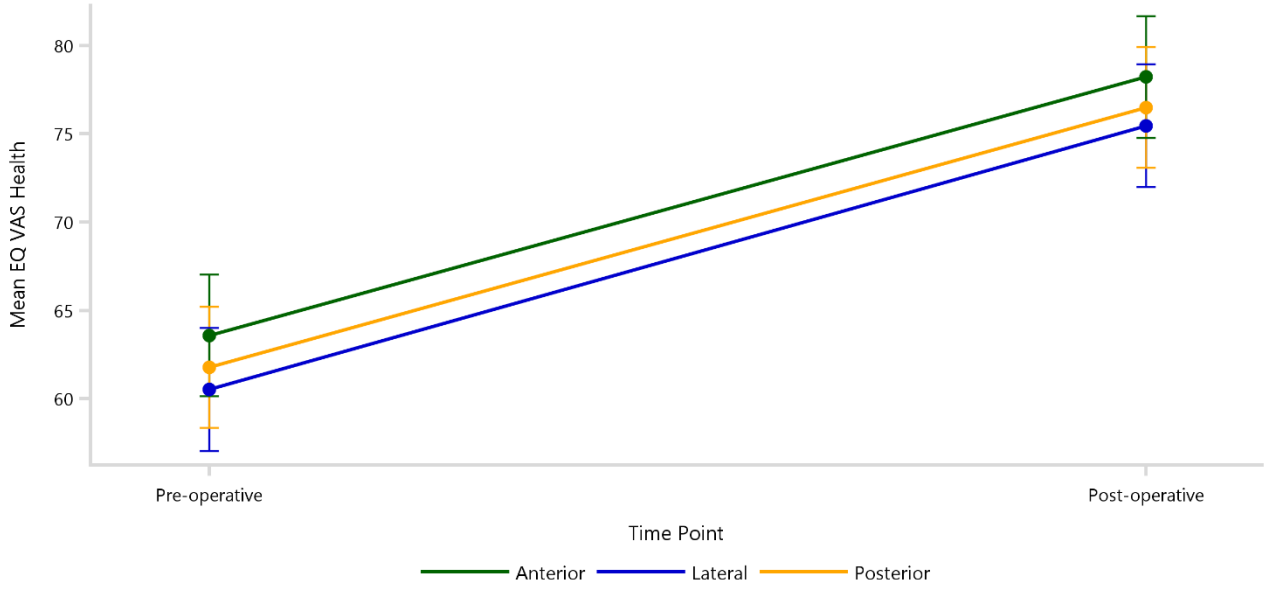
The patient-reported change of "much better" is slightly higher for the anterior approach compared to the lateral approach but was similar to the posterior approach (Table SPR21 and Figure SPR18).

Table SPR18 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)

Surgical Approach	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Anterior	8288	63.58 (60.13, 67.03)	6156	78.22 (74.77, 81.66)	14.64 (14.15, 15.13)
Lateral	3111	60.51 (57.03, 64.00)	2368	75.46 (71.98, 78.93)	14.94 (14.14, 15.74)
Posterior	20806	61.78 (58.35, 65.21)	14869	76.50 (73.07, 79.93)	14.72 (14.40, 15.03)

Note: Restricted to modern prostheses
Adjusted for age, gender, ASA score and BMI category

Figure SPR15 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)



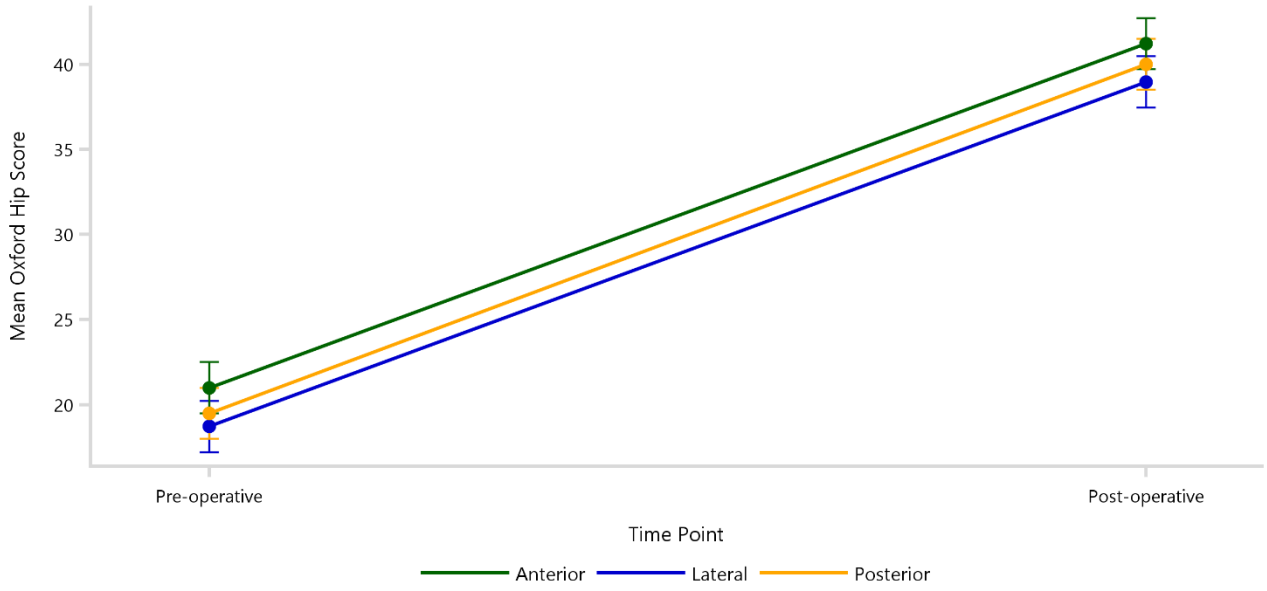
Note: Restricted to modern prostheses
Adjusted for age, gender, ASA score and BMI category

Table SPR19 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)

Surgical Approach	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Anterior	8270	20.99 (19.48, 22.49)	6146	41.20 (39.70, 42.71)	20.22 (19.99, 20.45)
Lateral	3120	18.71 (17.19, 20.23)	2360	38.96 (37.45, 40.47)	20.25 (19.87, 20.63)
Posterior	20821	19.48 (17.99, 20.98)	14925	40.00 (38.50, 41.49)	20.52 (20.37, 20.66)

Note: Restricted to modern prostheses
Adjusted for age, gender, ASA score and BMI category

Figure SPR16 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)



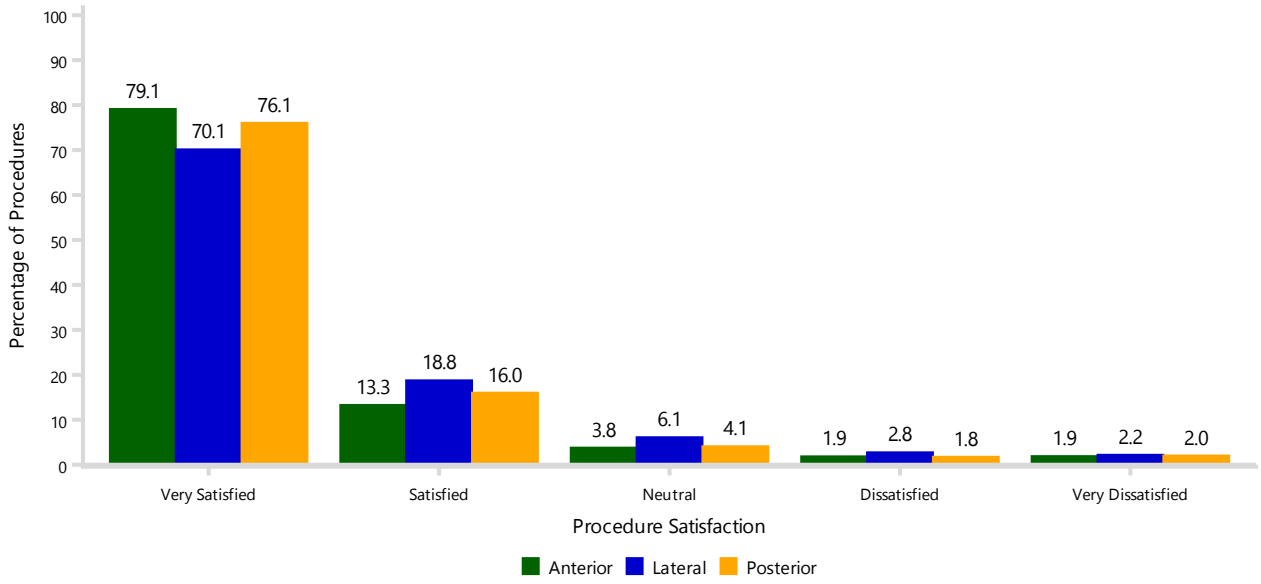
Note: Restricted to modern prostheses
Adjusted for age, gender, ASA score and BMI category

Table SPR20 Procedure Satisfaction in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)

Surgical Approach	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Anterior	4854	79.1	27.2	816	13.3	22.4	233	3.8	23.6	114	1.9	25.8	117	1.9	24.7	6134	100.0	26.2
Lateral	1652	70.1	9.3	442	18.8	12.1	144	6.1	14.6	65	2.8	14.7	52	2.2	11.0	2355	100.0	10.1
Posterior	11326	76.1	63.5	2387	16.0	65.5	611	4.1	61.8	263	1.8	59.5	305	2.0	64.3	14892	100.0	63.7
TOTAL	**17832**	**76.3**	**100.0**	**3645**	**15.6**	**100.0**	**988**	**4.2**	**100.0**	**442**	**1.9**	**100.0**	**474**	**2.0**	**100.0**	**23381**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR17 Procedure Satisfaction in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)



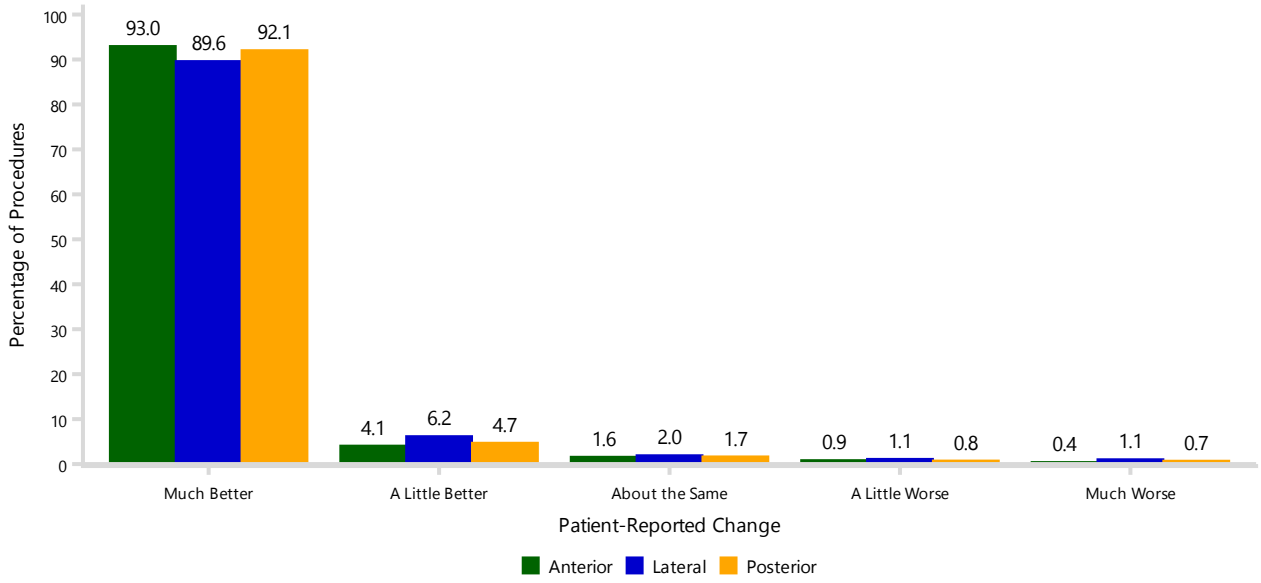
Note: Restricted to modern prostheses

Table SPR21 Patient-Reported Change in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)

Surgical Approach	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Anterior	5702	93.0	26.5	251	4.1	22.8	99	1.6	24.9	53	0.9	27.2	27	0.4	16.7	6132	100.0	26.2
Lateral	2111	89.6	9.8	146	6.2	13.2	46	2.0	11.6	27	1.1	13.8	25	1.1	15.4	2355	100.0	10.1
Posterior	13707	92.1	63.7	705	4.7	64.0	252	1.7	63.5	115	0.8	59.0	110	0.7	67.9	14889	100.0	63.7
TOTAL	**21520**	**92.1**	**100.0**	**1102**	**4.7**	**100.0**	**397**	**1.7**	**100.0**	**195**	**0.8**	**100.0**	**162**	**0.7**	**100.0**	**23376**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR18 Patient-Reported Change in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)



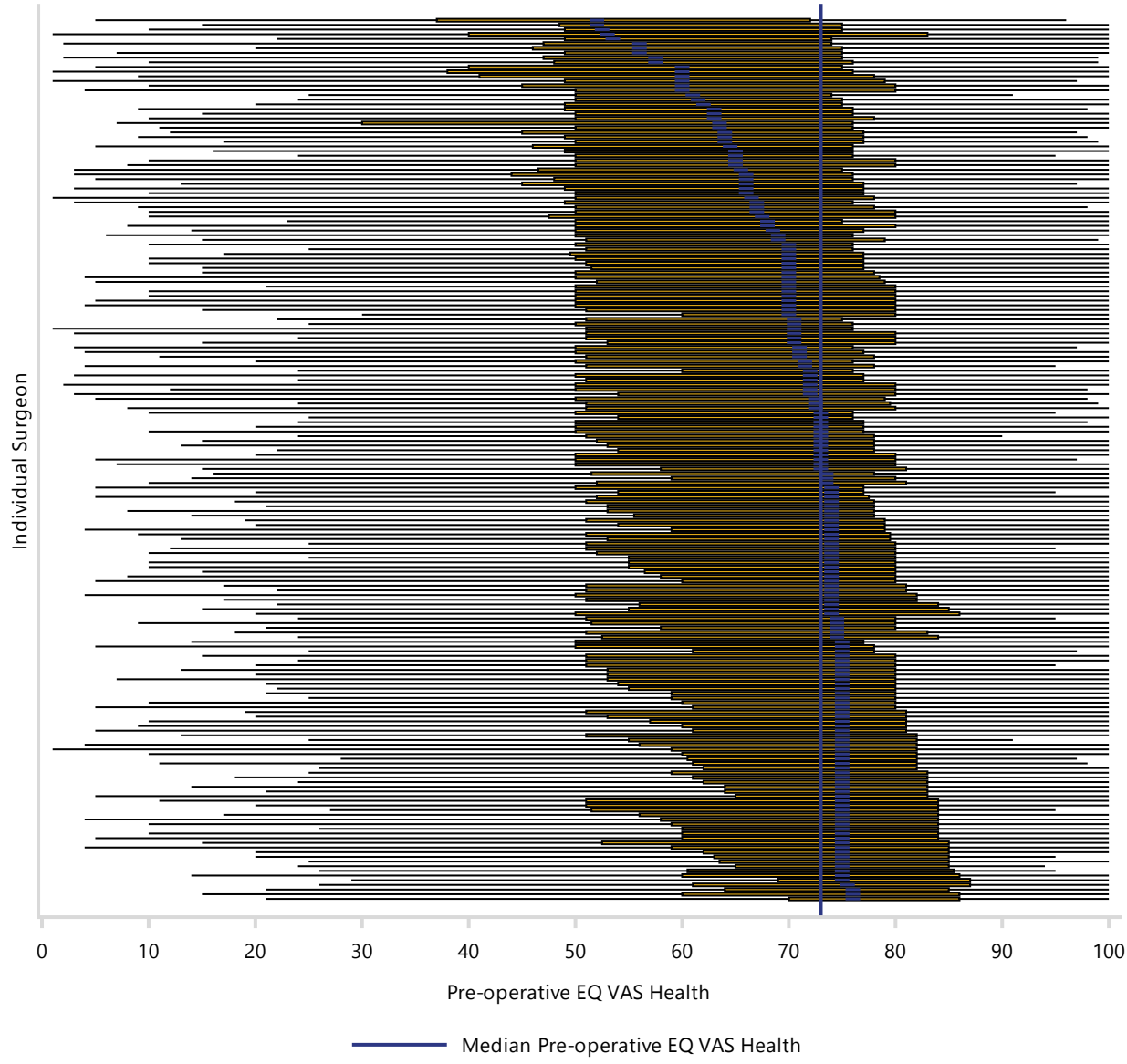
Note: Restricted to modern prostheses

SURGEON AND HOSPITAL PROMS

EQ-VAS

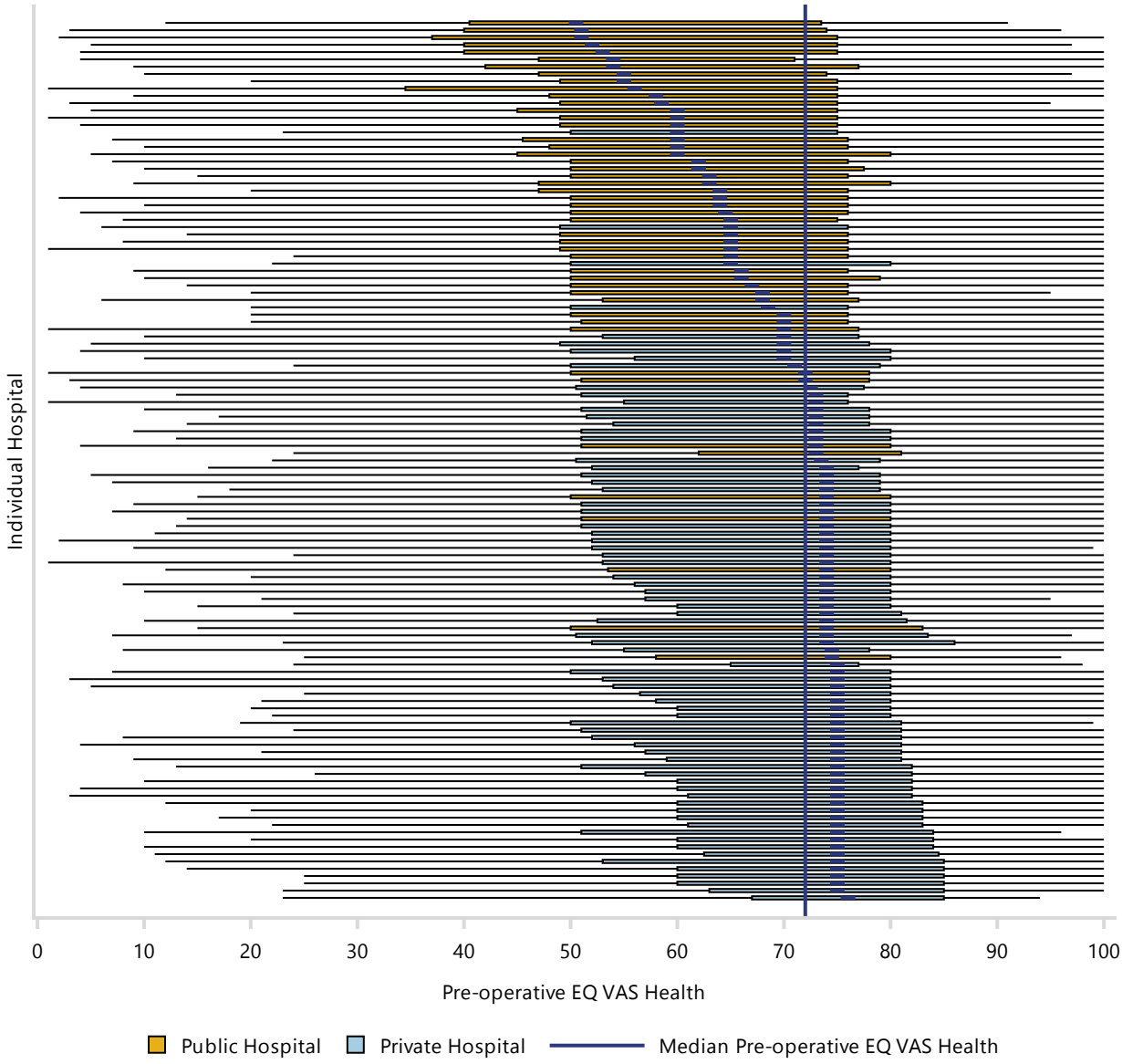
Variation between surgeons and between hospitals in the pre-operative EQ-VAS is displayed using 'caterpillar plots' for surgeons and hospitals with at least 50 recorded cases for primary total conventional hip replacement (Figure SPR19 and Figure SPR20). These analyses show pre-operative quality of life assessments for patients of individual surgeons or hospitals compared to the median value represented by the vertical blue line. The median for each surgeon is shown as a blue square, the interquartile range is coloured brown, while the entire range is shown by the grey bars. For the hospital analysis private and public hospitals are coloured blue and yellow, respectively. Almost all surgeons and hospitals have an interquartile range that includes the group median value. Most public hospitals have median values below the group median, indicating a comparatively lower preoperative quality of life for these patients.

Figure SPR19 Pre-Operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Surgeon (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only surgeons with at least 50 procedures have been shown
The median pre-operative EQ-VAS Health is 73

Figure SPR20 Pre-Operative EQ-VAS Health in Primary Total Conventional Hip Replacement by Hospital (Primary Diagnosis OA)



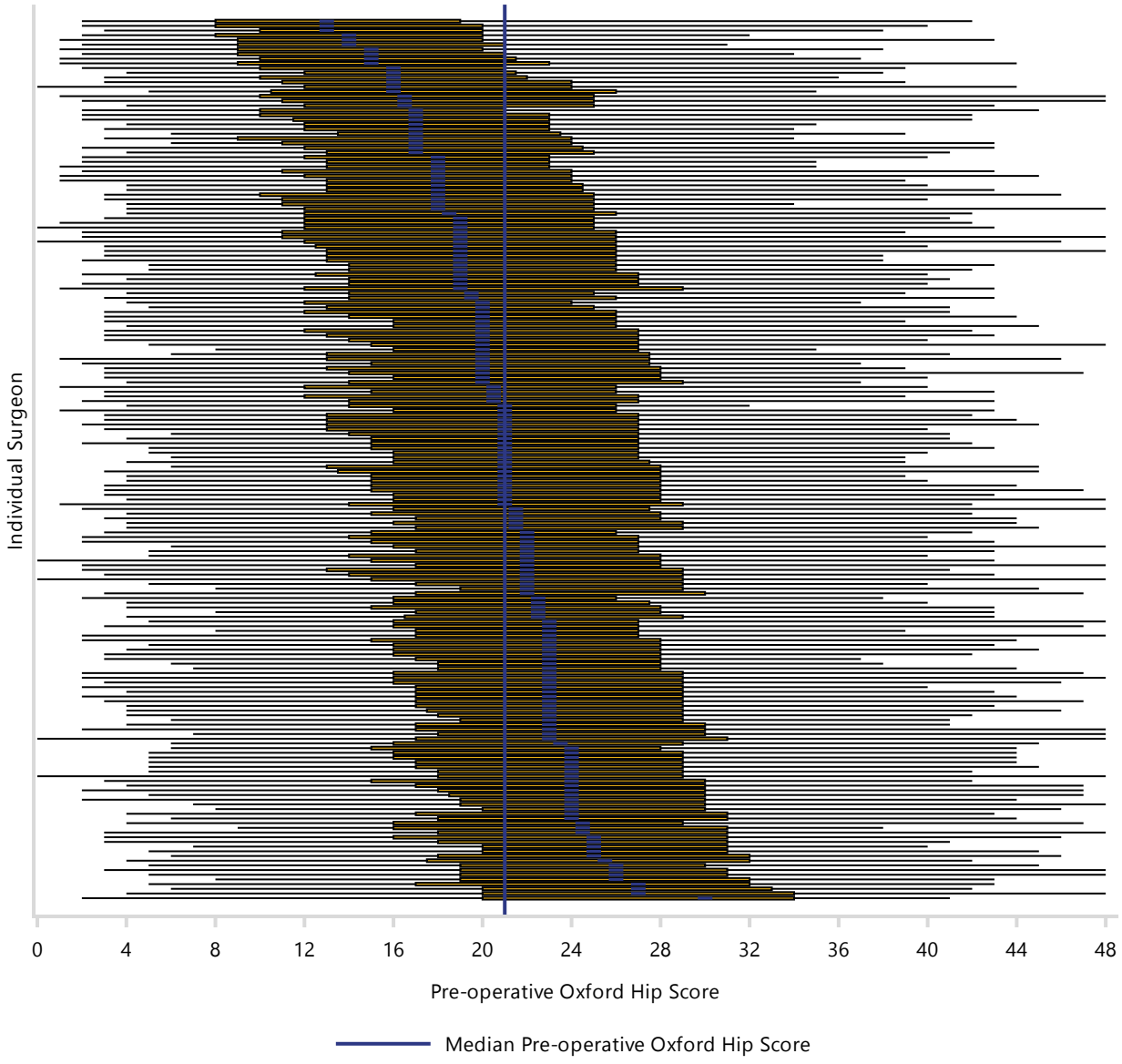
Note: Restricted to modern prostheses
Only hospitals with at least 50 procedures have been shown
The median pre-operative EQ-VAS Health is 72

Oxford Score

Comparisons of pre-operative Oxford Scores between surgeons and between hospitals for primary total conventional hip replacement are shown in Figure SPR21 and Figure SPR22.

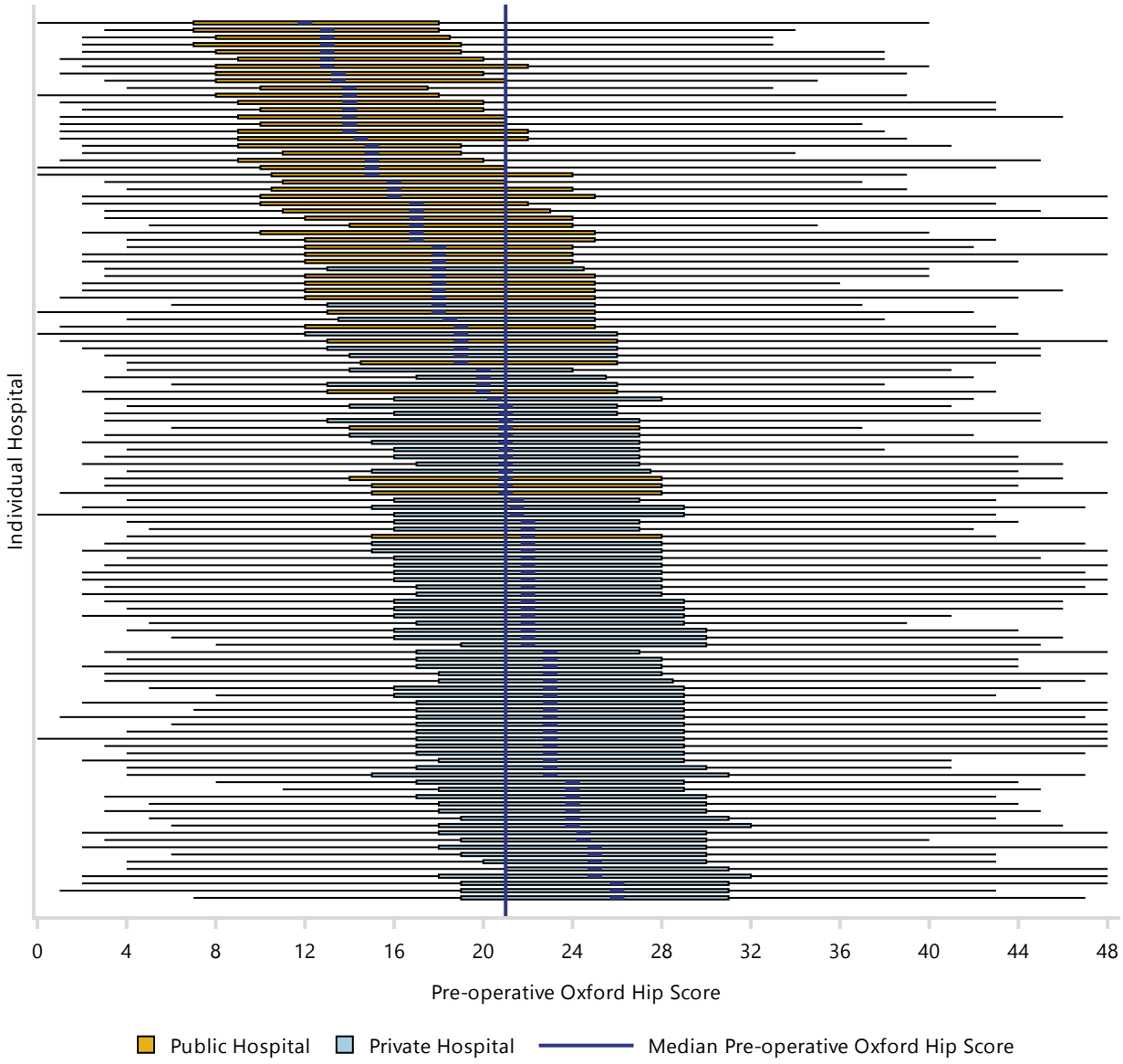
Individual medians are shown as blue squares, compared to the group median represented by the vertical blue line. Like the EQ-VAS analysis, public hospital patients generally have lower median preoperative Oxford hip scores compared to the national median.

Figure SPR21 Pre-Operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Surgeon (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only surgeons with at least 50 procedures have been shown
The median pre-operative Oxford Hip Score is 21

Figure SPR22 Pre-Operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Hospital (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only hospitals with at least 50 procedures have been shown
The median pre-operative Oxford Hip Score is 21

Knee Summary

PATIENT CHARACTERISTICS

EQ-VAS and EQ-5D-5L

The EQ-VAS and EQ-5D-5L are measures of quality of life. EQ-VAS is a measure of patient-reported health, and ranges from 0 (worst health imaginable) to 100 (best health imaginable).

The mean EQ-VAS increased by almost 10 points following knee replacement (Table SPR22). Pre-operative and 6-month post-operative scores following total knee replacement are shown in Figure SPR23. The percentage of patients who reported being better, worse or no different post-operatively compared to their pre-operative response for each of the EQ-5D-5L domains and the EQ-VAS is shown in Figure SPR24.

Age <65 years and female gender are associated with lower pre-operative EQ-VAS scores. Improvement after surgery occurs in all subgroups, but the change is greater for patients aged <65 years, and for females (0 and Figure SPR25).

Pre-operative mean EQ-VAS decreases with increasing ASA score, but the magnitude of change after surgery is similar in each group (Table SPR24 and Figure SPR26).

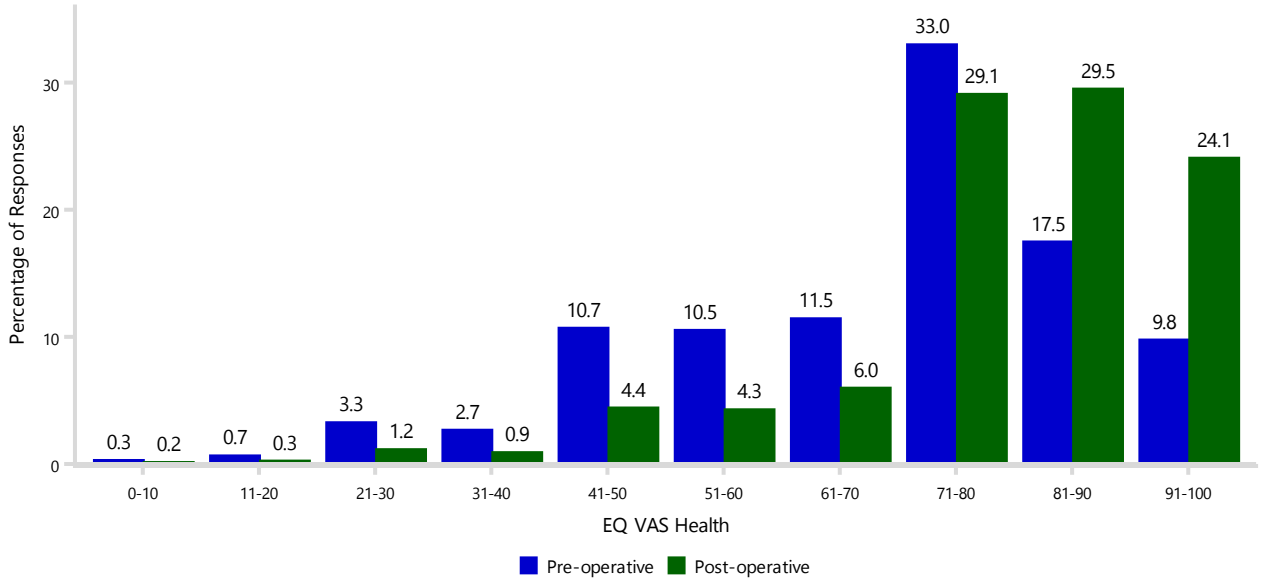
The mean EQ-VAS assessment before surgery decreases with each rise in BMI category, except in the underweight group. The magnitude of change increases with each BMI category (Table SPR25 and Figure SPR27).

Table SPR22 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Knee	51335	70.14±18.17	75.00 (59.00, 83.00)	36276	80.10±15.41	83.00 (75.00, 90.00)

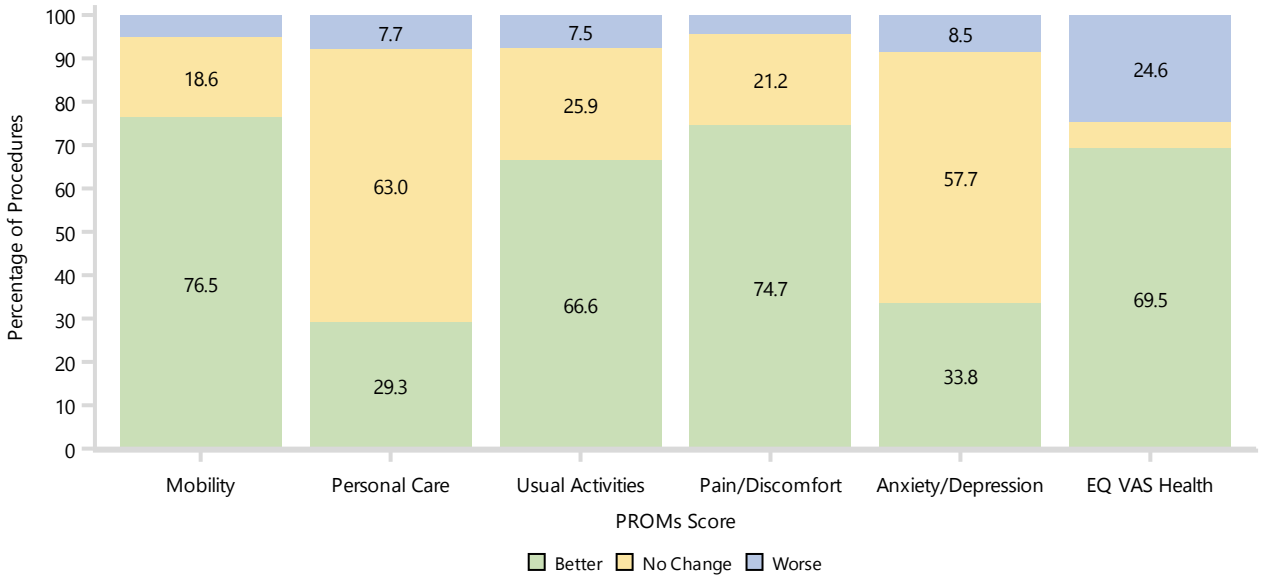
Note: Restricted to modern prostheses

Figure SPR23 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Figure SPR24 Change in EQ-5D-5L Domain Score and EQ-VAS Health in Primary Total Knee Replacement (Primary Diagnosis OA)



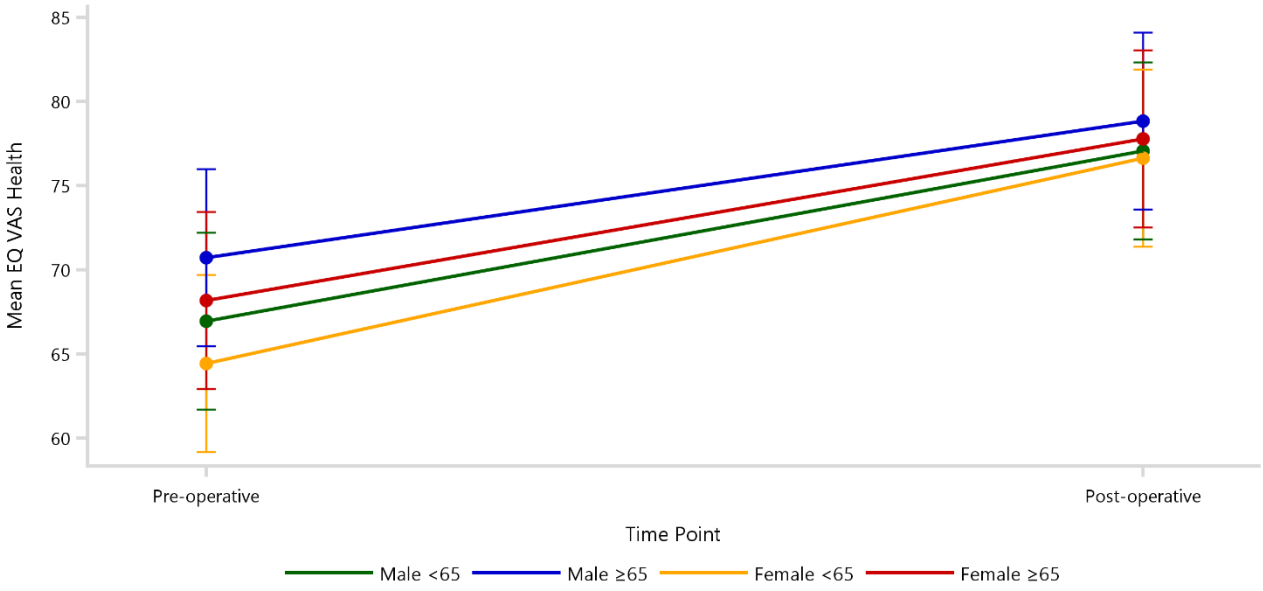
Note: Restricted to modern prostheses

Table SPR23 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	<65	8498	66.94 (61.68, 72.20)	5983	77.05 (71.79, 82.31)	10.11 (9.66, 10.56)
	≥65	14670	70.71 (65.45, 75.96)	10383	78.83 (73.58, 84.09)	8.13 (7.78, 8.47)
Female	<65	9981	64.42 (59.16, 69.68)	7112	76.62 (71.36, 81.88)	12.21 (11.79, 12.62)
	≥65	18186	68.16 (62.91, 73.41)	12798	77.77 (72.52, 83.02)	9.61 (9.30, 9.92)

Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Figure SPR25 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)



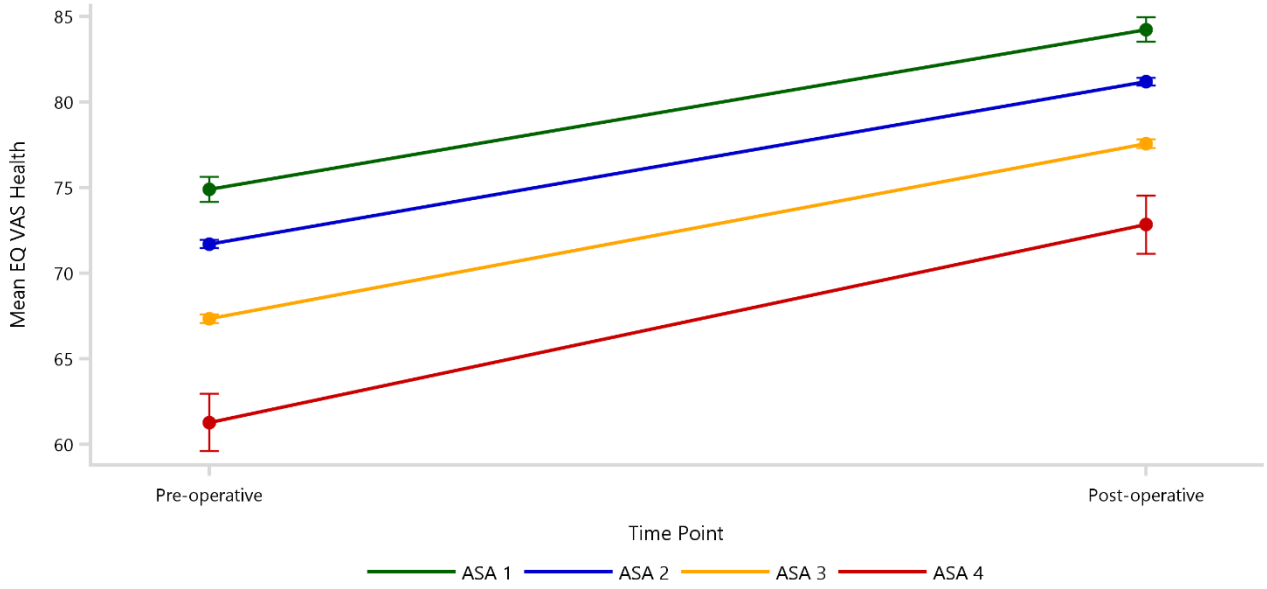
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Table SPR24 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 1	2347	74.90 (74.16, 75.63)	1791	84.23 (83.52, 84.93)	9.33 (8.49, 10.17)
ASA 2	27164	71.69 (71.46, 71.92)	19503	81.18 (80.95, 81.40)	9.48 (9.23, 9.74)
ASA 3	21330	67.33 (67.08, 67.57)	14634	77.54 (77.29, 77.79)	10.21 (9.93, 10.50)
ASA 4	429	61.26 (59.59, 62.93)	294	72.83 (71.13, 74.53)	11.57 (9.53, 13.61)

Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Figure SPR26 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by ASA Score (Primary Diagnosis OA)



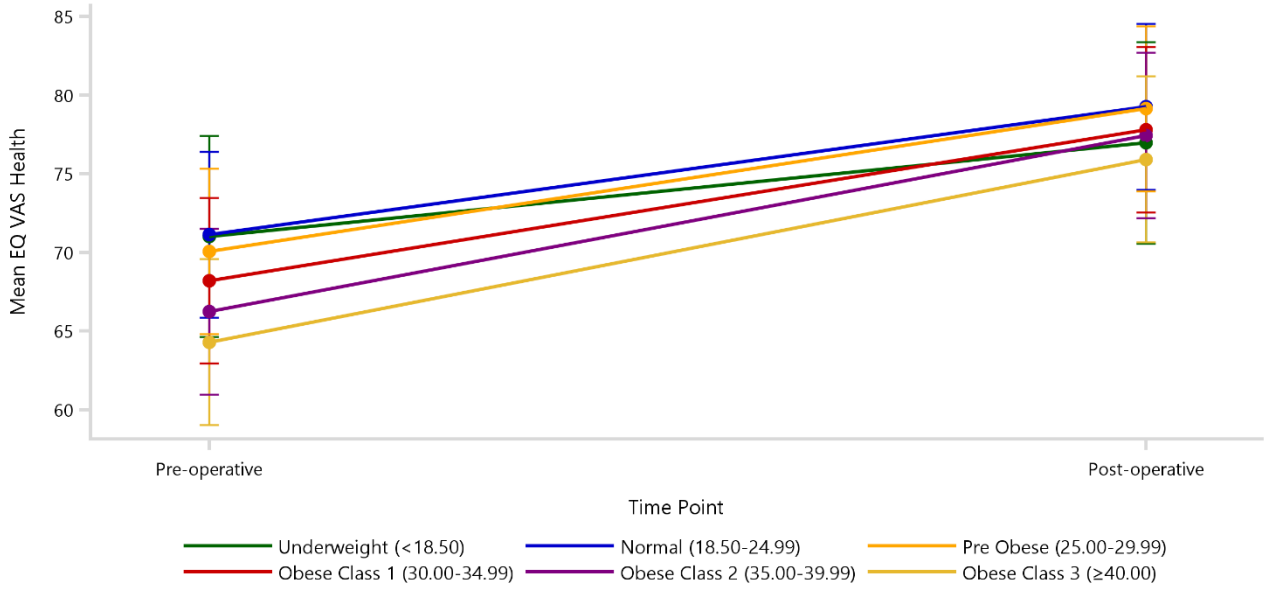
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Table SPR25 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Underweight (<18.50)	89	70.99 (64.59, 77.39)	63	76.95 (70.55, 83.36)	5.96 (1.58, 10.35)
Normal (18.50-24.99)	5201	71.11 (65.83, 76.38)	3641	79.24 (73.97, 84.52)	8.14 (7.56, 8.71)
Pre Obese (25.00-29.99)	15732	70.04 (64.78, 75.30)	11205	79.12 (73.86, 84.37)	9.08 (8.75, 9.41)
Obese Class 1 (30.00-34.99)	15567	68.17 (62.91, 73.43)	10989	77.80 (72.54, 83.05)	9.63 (9.29, 9.96)
Obese Class 2 (35.00-39.99)	8855	66.22 (60.95, 71.48)	6206	77.43 (72.16, 82.69)	11.21 (10.77, 11.65)
Obese Class 3 (≥40.00)	5566	64.27 (59.00, 69.55)	3942	75.89 (70.62, 81.17)	11.62 (11.07, 12.17)

Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years

Figure SPR27 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Knee Replacement by BMI Category (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years
Only BMI categories with >40 pre-operative and post-operative responses are listed

Oxford Scores

The Oxford Knee Score (OKS) provides a joint specific assessment of pain and function. The OKS totals the responses from 12 questions, each on a 5-level scale of 0 (worst possible score) to 4 (best possible score). The mean preoperative Oxford knee score was 23.0 and the mean post-operative score was 37.9. The minimal clinically important change in the OKS for a single group of patients is9 points. The minimal important difference between groups of patients is 5 points (Table SPR26).

Similar to the EQ-VAS assessments, pre-operative mean OKS similar between ages and genders (Table SPR27 and Figure SPR28).

Pre-operative mean Oxford scores are lower with each increase in ASA score and with each increase in BMI category, except for those in the underweight group, where the numbers for analysis are small. Similar increases in Oxford score are seen post-operatively in all ASA scores and BMI categories (Table SPR28, Figure SPR29, Table SPR29 and Figure SPR30).

Table SPR26 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Knee	51261	22.95±8.39	23.00 (17.00, 29.00)	36371	37.85±7.78	40.00 (34.00, 44.00)

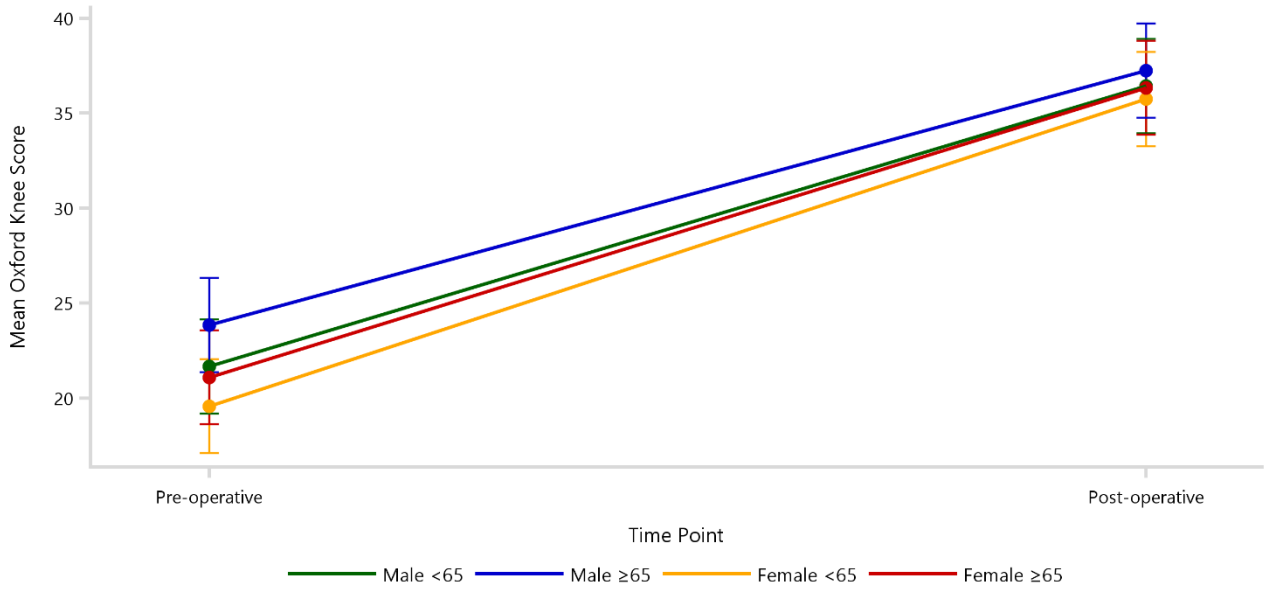
Note: Restricted to modern prostheses

Table SPR27 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Pre-operative		Post-operative		
		N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	<65	8461	21.67 (19.20, 24.15)	5987	36.43 (33.95, 38.90)	14.76 (14.53, 14.98)
	≥65	14640	23.85 (21.37, 26.32)	10418	37.24 (34.77, 39.72)	13.40 (13.22, 13.57)
Female	<65	9960	19.58 (17.10, 22.05)	7113	35.75 (33.27, 38.22)	16.17 (15.96, 16.38)
	≥65	18200	21.10 (18.63, 23.57)	12853	36.34 (33.86, 38.81)	15.24 (15.09, 15.39)

Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Figure SPR28 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)



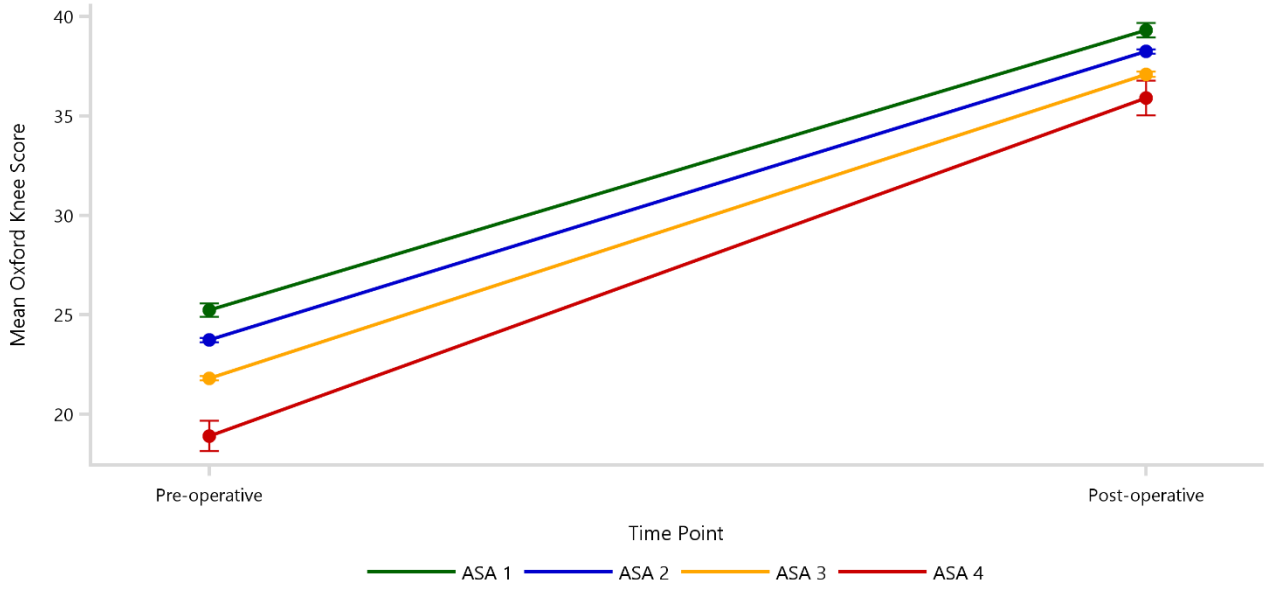
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

Table SPR28 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 1	2344	25.22 (24.89, 25.55)	1802	39.30 (38.94, 39.66)	14.08 (13.66, 14.50)
ASA 2	27108	23.72 (23.61, 23.82)	19548	38.22 (38.11, 38.34)	14.50 (14.38, 14.63)
ASA 3	21317	21.80 (21.69, 21.91)	14675	37.09 (36.96, 37.21)	15.28 (15.14, 15.43)
ASA 4	426	18.89 (18.13, 19.65)	293	35.89 (35.02, 36.76)	17.00 (15.97, 18.02)

Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Figure SPR29 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by ASA Score (Primary Diagnosis OA)



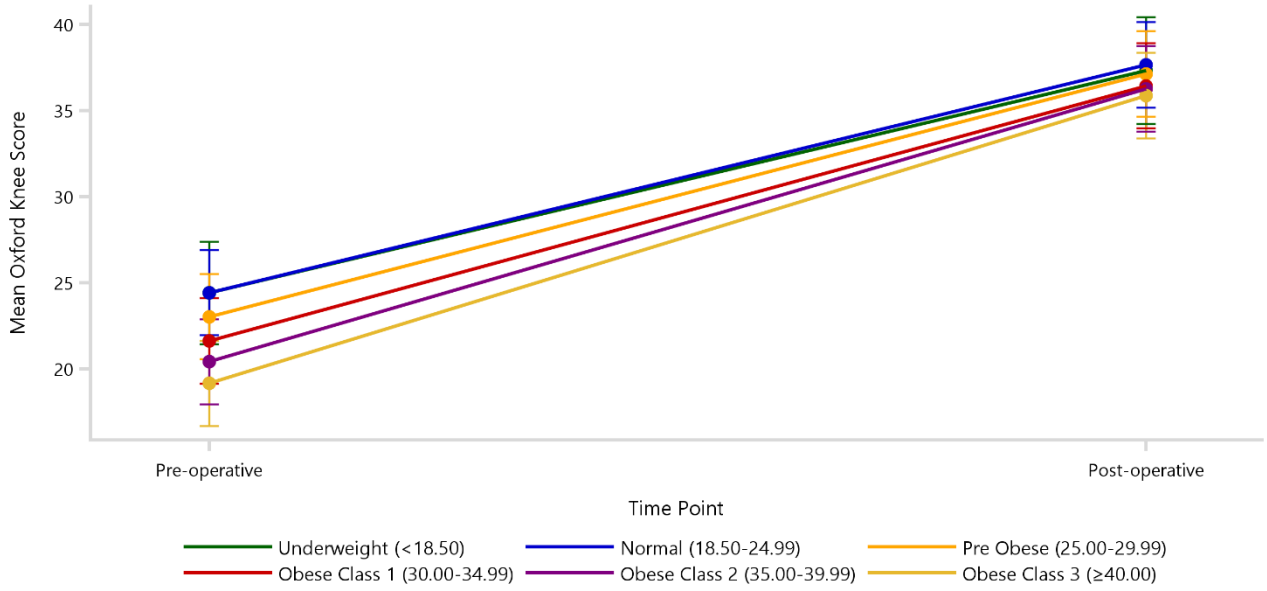
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

Table SPR29 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Underweight (<18.50)	89	24.40 (21.43, 27.38)	63	37.32 (34.22, 40.42)	12.92 (10.72, 15.12)
Normal (18.50-24.99)	5185	24.42 (21.94, 26.90)	3659	37.66 (35.18, 40.15)	13.24 (12.95, 13.53)
Pre Obese (25.00-29.99)	15725	23.02 (20.55, 25.50)	11223	37.13 (34.65, 39.60)	14.10 (13.94, 14.27)
Obese Class 1 (30.00-34.99)	15536	21.62 (19.14, 24.09)	11019	36.43 (33.96, 38.91)	14.82 (14.65, 14.98)
Obese Class 2 (35.00-39.99)	8851	20.41 (17.93, 22.89)	6227	36.26 (33.78, 38.74)	15.85 (15.63, 16.07)
Obese Class 3 (≥40.00)	5553	19.14 (16.66, 21.63)	3951	35.87 (33.39, 38.35)	16.73 (16.45, 17.00)

Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years

Figure SPR30 Mean Pre-operative and Post-operative Oxford Knee Score in Primary Total Knee Replacement by BMI Category (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age, gender and ASA score
BMI has not been presented for patients aged ≤19 years
Only BMI categories with >40 pre-operative and post-operative responses are listed

Patient Satisfaction and Change

Patients were surveyed at 6 months post-operatively on how satisfied they were with their primary knee replacement, and on their perceived change in their knee after surgery. Satisfaction following knee replacement is shown in Table SPR30. After knee replacement, 85.2% of patients are satisfied or very satisfied.

Procedure satisfaction by age and gender are presented in Table SPR31 and Figure SPR31.

There is a high percentage (92.4%) of patients who rate their knee as much better or a little better (Table SPR32).

Patient-reported change by age and gender are presented in Table SPR33 and Figure SPR32.

Table SPR30 Procedure Satisfaction in Primary Total Knee Replacement (Primary Diagnosis OA)

Class	Very Satisfied		Satisfied		Neutral		Dissatisfied		Very Dissatisfied		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Knee	21811	60.1	9127	25.1	3299	9.1	1332	3.7	738	2.0	36307	100.0

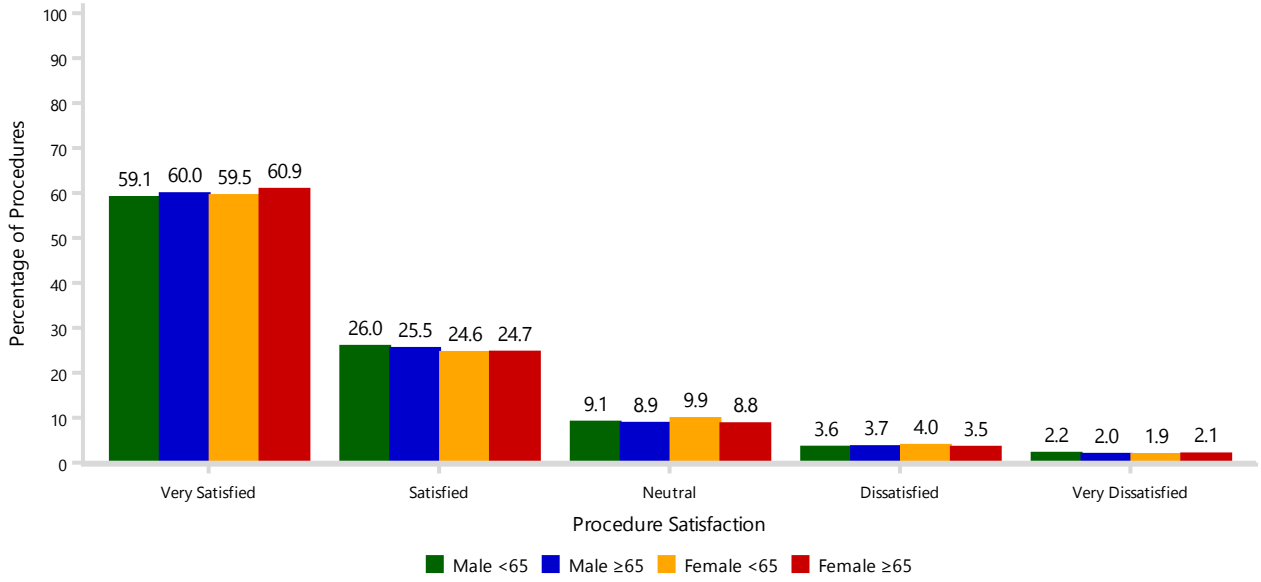
Note: Restricted to modern prostheses

Table SPR31 Procedure Satisfaction in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
		N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Male	<65	3534	59.1	16.2	1554	26.0	17.0	546	9.1	16.6	213	3.6	16.0	132	2.2	17.9	5979	100.0	16.5
	≥65	6238	60.0	28.6	2656	25.5	29.1	923	8.9	28.0	383	3.7	28.8	205	2.0	27.8	10405	100.0	28.7
Female	<65	4227	59.5	19.4	1749	24.6	19.2	705	9.9	21.4	282	4.0	21.2	137	1.9	18.6	7100	100.0	19.6
	≥65	7812	60.9	35.8	3168	24.7	34.7	1125	8.8	34.1	454	3.5	34.1	264	2.1	35.8	12823	100.0	35.3
TOTAL		**21811**	**60.1**	**100.0**	**9127**	**25.1**	**100.0**	**3299**	**9.1**	**100.0**	**1332**	**3.7**	**100.0**	**738**	**2.0**	**100.0**	**36307**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR31 Procedure Satisfaction in Primary Total Knee Replacement by Gender and Age (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Table SPR32 Patient-Reported Change after Primary Total Knee Replacement (Primary Diagnosis OA)

Class	Much Better		A Little Better		About the Same		A Little Worse		Much Worse		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Knee	29676	81.8	3831	10.6	1315	3.6	924	2.5	554	1.5	36300	100.0

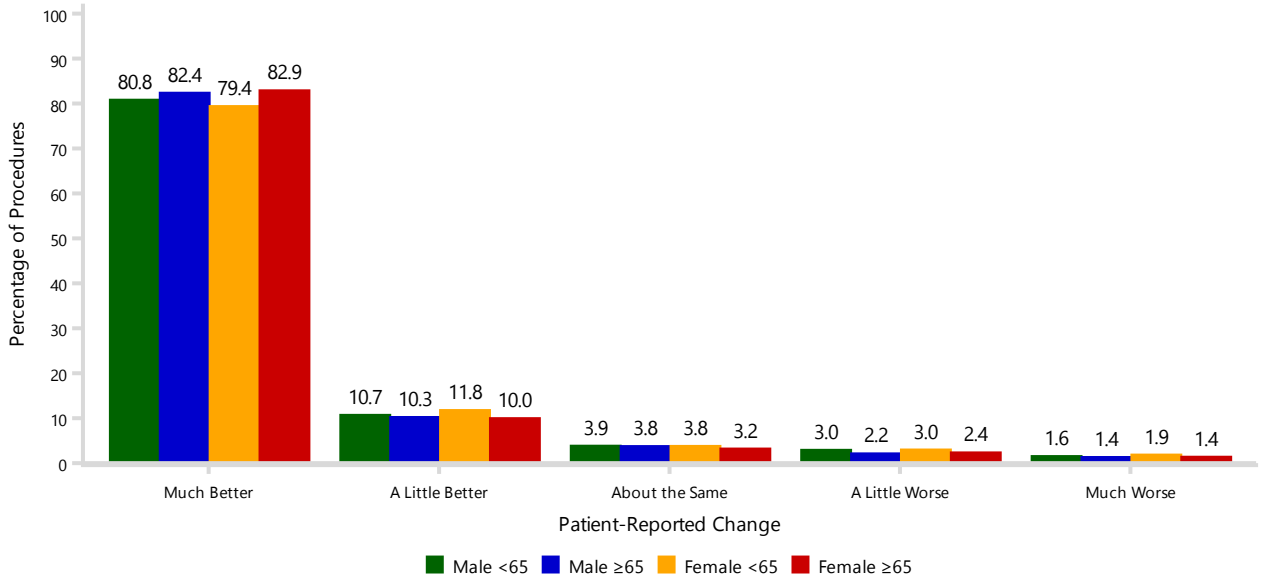
Note: Restricted to modern prostheses

Table SPR33 Patient-Reported Change after Primary Total Knee Replacement by Age and Gender (Primary Diagnosis OA)

Gender	Age	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
		N	Row%	Col%	N	Row%	Col%	N	Row %	Col%	N	Row%	Col%	N	Row %	Col%	N	Row%	Col%
Male	<65	4833	80.8	16.3	642	10.7	16.8	232	3.9	17.6	177	3.0	19.2	94	1.6	17.0	5978	100.0	16.5
	≥65	8573	82.4	28.9	1068	10.3	27.9	395	3.8	30.0	226	2.2	24.5	142	1.4	25.6	10404	100.0	28.7
Female	<65	5637	79.4	19.0	838	11.8	21.9	272	3.8	20.7	215	3.0	23.3	135	1.9	24.4	7097	100.0	19.6
	≥65	10633	82.9	35.8	1283	10.0	33.5	416	3.2	31.6	306	2.4	33.1	183	1.4	33.0	12821	100.0	35.3
TOTAL		**29676**	**81.8**	**100.0**	**3831**	**10.6**	**100.0**	**1315**	**3.6**	**100.0**	**924**	**2.5**	**100.0**	**554**	**1.5**	**100.0**	**36300**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR32 Patient-Reported Change after Primary Total Knee Replacement by Age and Gender (Primary Diagnosis OA)



Note: Restricted to modern prostheses

PROSTHESIS CHARACTERISTICS

Stability

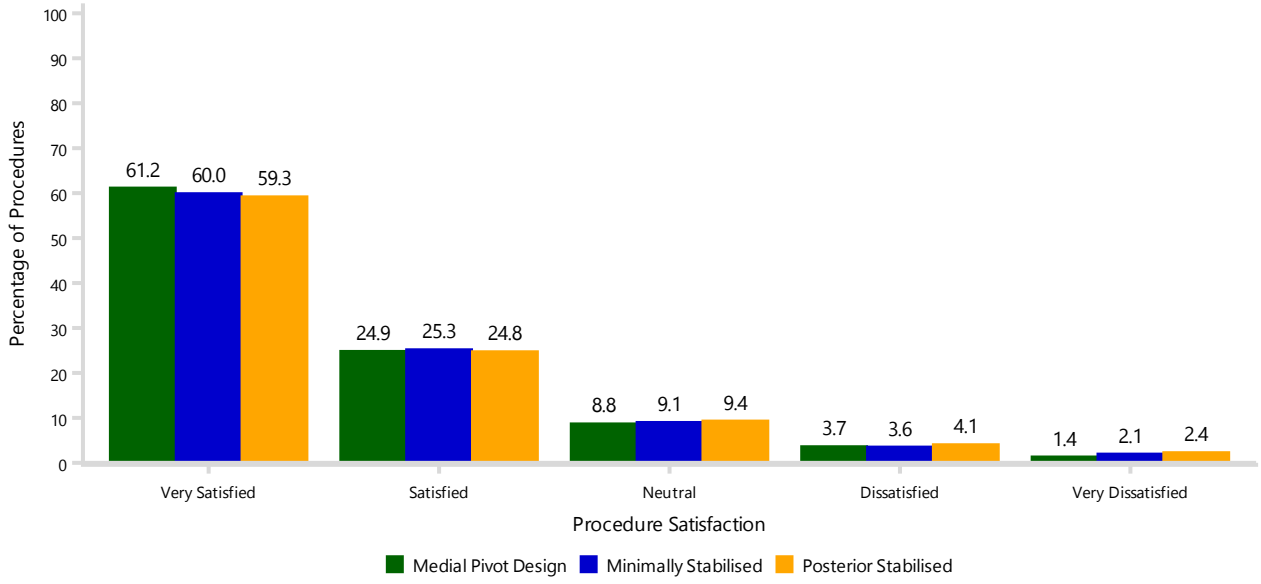
PROMs outcomes are reported with respect to selected prosthesis characteristics. Patient satisfaction (the proportion of patients who are satisfied or very satisfied) following knee replacement ranges from 84% to 86% when prosthesis stability is considered (Table SPR34 and Figure SPR33). For all stability types, patient-reported change (the proportion of patients who are much better or a little better) is over 91% (Table SPR35 and Figure SPR34).

Table SPR34 Procedure Satisfaction in Primary Total Knee Replacement by Stability (Primary Diagnosis OA)

Stability	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Medial Pivot Design	2039	61.2	9.4	829	24.9	9.1	292	8.8	8.9	123	3.7	9.3	47	1.4	6.4	3330	100.0	9.2
Minimally Stabilised	16892	60.0	78.2	7114	25.3	78.5	2560	9.1	78.1	1018	3.6	76.7	578	2.1	79.0	28162	100.0	78.2
Posterior Stabilised	2680	59.3	12.4	1122	24.8	12.4	425	9.4	13.0	187	4.1	14.1	107	2.4	14.6	4521	100.0	12.6
TOTAL	**21611**	**60.0**	**100.0**	**9065**	**25.2**	**100.0**	**3277**	**9.1**	**100.0**	**1328**	**3.7**	**100.0**	**732**	**2.0**	**100.0**	**36013**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR33 Procedure Satisfaction in Primary Total Knee Replacement by Stability (Primary Diagnosis OA)



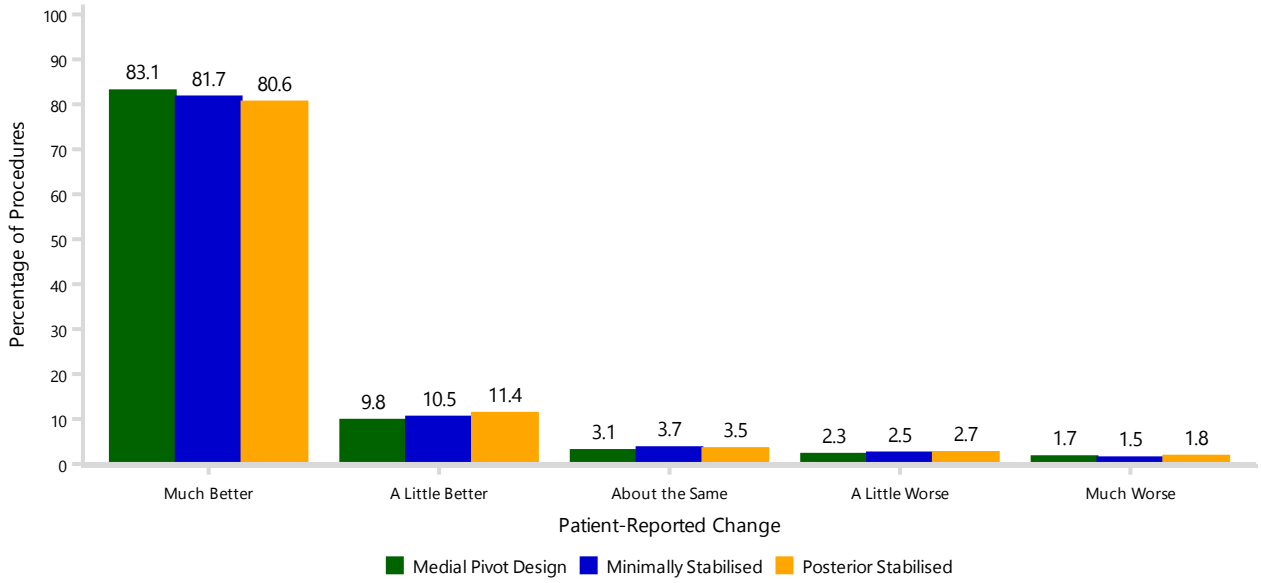
Note: Restricted to modern prostheses

Table SPR35 Patient-Reported Change after Primary Total Knee Replacement by Stability (Primary Diagnosis OA)

Stability	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row%	Col%	N	Row %	Col%	N	Row%	Col%
Medial Pivot Design	2766	83.1	9.4	327	9.8	8.6	103	3.1	7.9	75	2.3	8.2	57	1.7	10.3	3328	100.0	9.2
Minimally Stabilised	23018	81.7	78.2	2963	10.5	77.9	1047	3.7	80.0	717	2.5	78.6	413	1.5	74.7	28158	100.0	78.2
Posterior Stabilised	3644	80.6	12.4	514	11.4	13.5	159	3.5	12.1	120	2.7	13.2	83	1.8	15.0	4520	100.0	12.6
TOTAL	**29428**	**81.7**	**100.0**	**3804**	**10.6**	**100.0**	**1309**	**3.6**	**100.0**	**912**	**2.5**	**100.0**	**553**	**1.5**	**100.0**	**36006**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR34 Patient-Reported Change after Primary Total Knee Replacement by Stability (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Patella Usage

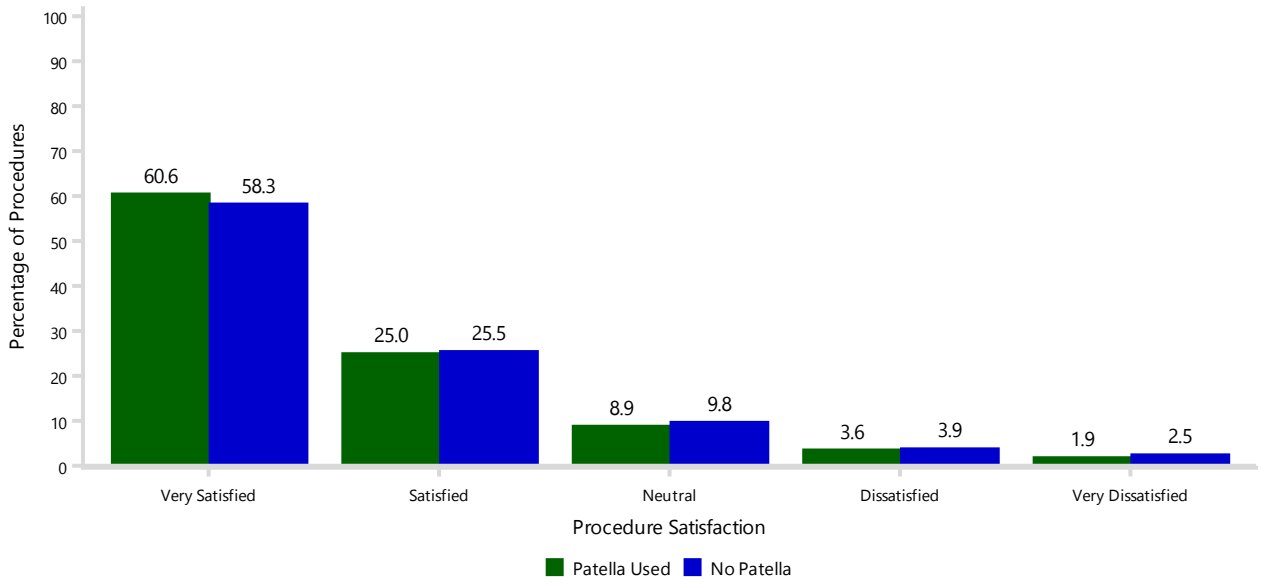
Post-operative satisfaction and patient-reported change are similar when analysed by patella component use (Table SPR36, Figure SPR35, Table SPR37 and Figure SPR36).

Table SPR36 Procedure Satisfaction in Primary Total Knee Replacement by Patella Usage (Primary Diagnosis OA)

Patella Usage	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Patella Used	17181	60.6	78.8	7102	25.0	77.8	2524	8.9	76.5	1025	3.6	77.0	537	1.9	72.8	28369	100.0	78.1
No Patella	4630	58.3	21.2	2025	25.5	22.2	775	9.8	23.5	307	3.9	23.0	201	2.5	27.2	7938	100.0	21.9
TOTAL	**21811**	**60.1**	**100.0**	**9127**	**25.1**	**100.0**	**3299**	**9.1**	**100.0**	**1332**	**3.7**	**100.0**	**738**	**2.0**	**100.0**	**36307**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR35 Procedure Satisfaction in Primary Total Knee Replacement by Patella Usage (Primary Diagnosis OA)



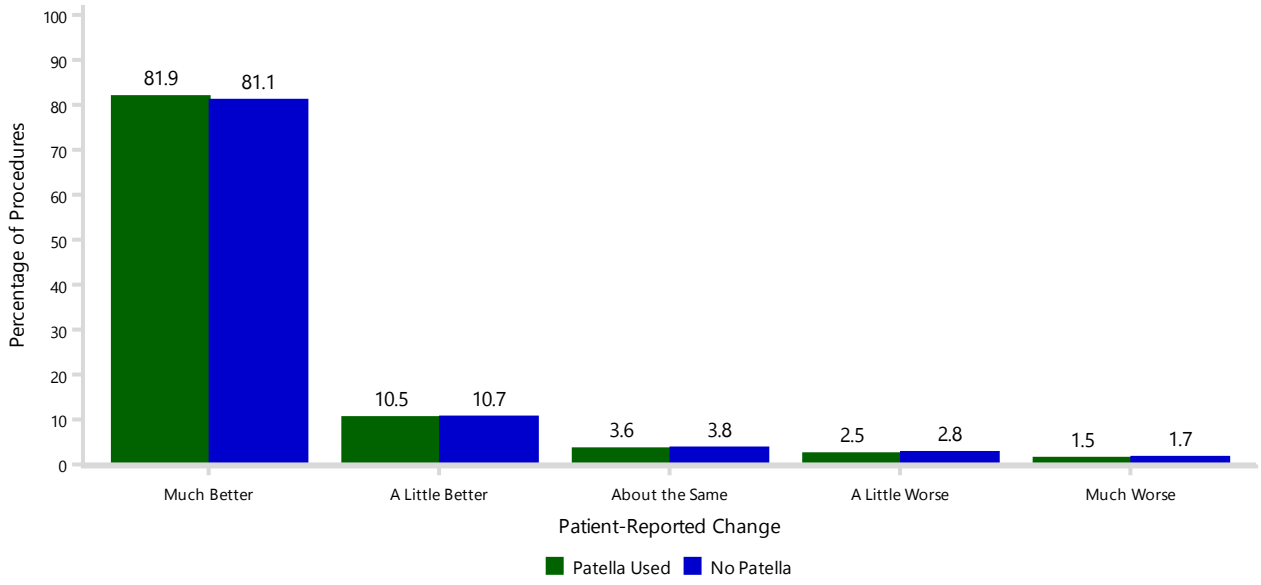
Note: Restricted to modern prostheses

Table SPR37 Patient-Reported Change after Primary Total Knee Replacement by Patella Usage (Primary Diagnosis OA)

Patella Usage	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Patella Used	23240	81.9	78.3	2986	10.5	77.9	1016	3.6	77.3	704	2.5	76.2	420	1.5	75.8	28366	100.0	78.1
No Patella	6436	81.1	21.7	845	10.7	22.1	299	3.8	22.7	220	2.8	23.8	134	1.7	24.2	7934	100.0	21.9
TOTAL	**29676**	**81.8**	**100.0**	**3831**	**10.6**	**100.0**	**1315**	**3.6**	**100.0**	**924**	**2.5**	**100.0**	**554**	**1.5**	**100.0**	**36300**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR36 Patient-Reported Change after Primary Total Knee Replacement by Patella Usage (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Technology Assistance

Satisfaction and perceived change scores are also reported with respect to surgical technique. Satisfaction (patients who report they are satisfied or very satisfied) with and without technology assistance is over 83% for each surgical technique (Table SPR38 and Figure SPR37).

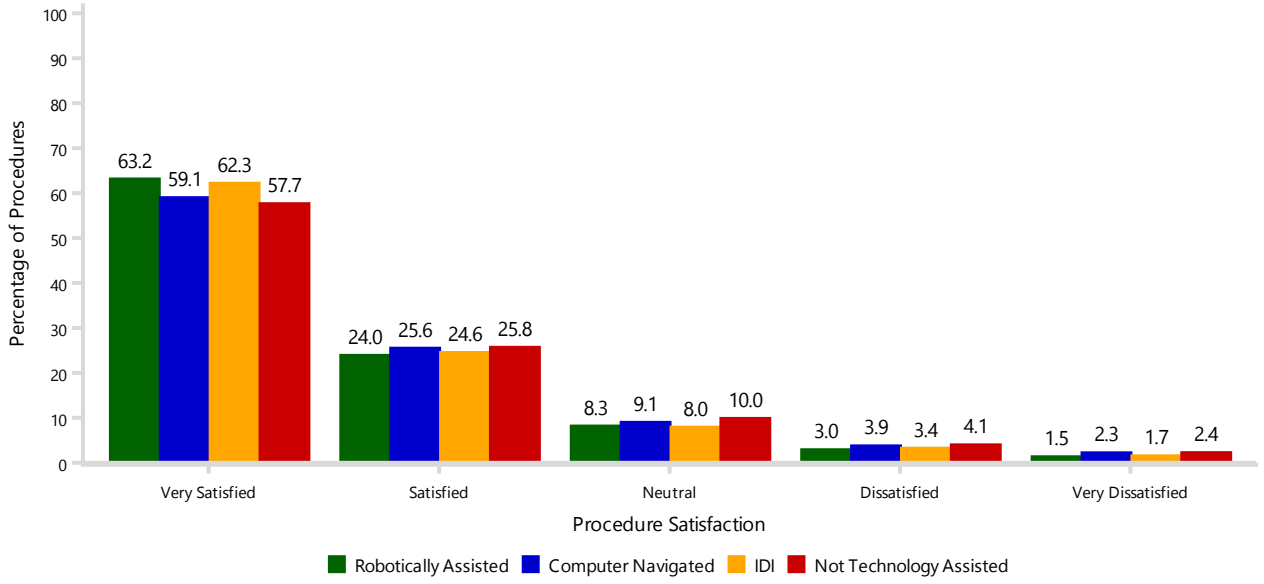
Change after surgery is reported as much better in over 81% of procedures with each surgical technique used with assistive performance (Table SPR39 and Figure SPR38).

Table SPR38 Procedure Satisfaction in Primary Total Knee Replacement by Technology Assistance (Primary Diagnosis OA)

Technology Assistance	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Robotically Assisted	6146	63.2	28.2	2333	24.0	25.6	805	8.3	24.4	293	3.0	22.0	141	1.5	19.1	9718	100.0	26.8
Computer Navigated	5449	59.1	25.0	2361	25.6	25.9	840	9.1	25.5	357	3.9	26.8	215	2.3	29.1	9222	100.0	25.4
IDI	2558	62.3	11.7	1012	24.6	11.1	330	8.0	10.0	138	3.4	10.4	68	1.7	9.2	4106	100.0	11.3
Not Technology Assisted	7658	57.7	35.1	3421	25.8	37.5	1324	10.0	40.1	544	4.1	40.8	314	2.4	42.5	13261	100.0	36.5
TOTAL	**21811**	**60.1**	**100.0**	**9127**	**25.1**	**100.0**	**3299**	**9.1**	**100.0**	**1332**	**3.7**	**100.0**	**738**	**2.0**	**100.0**	**36307**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR37 Procedure Satisfaction in Primary Total Knee Replacement by Technology Assistance (Primary Diagnosis OA)



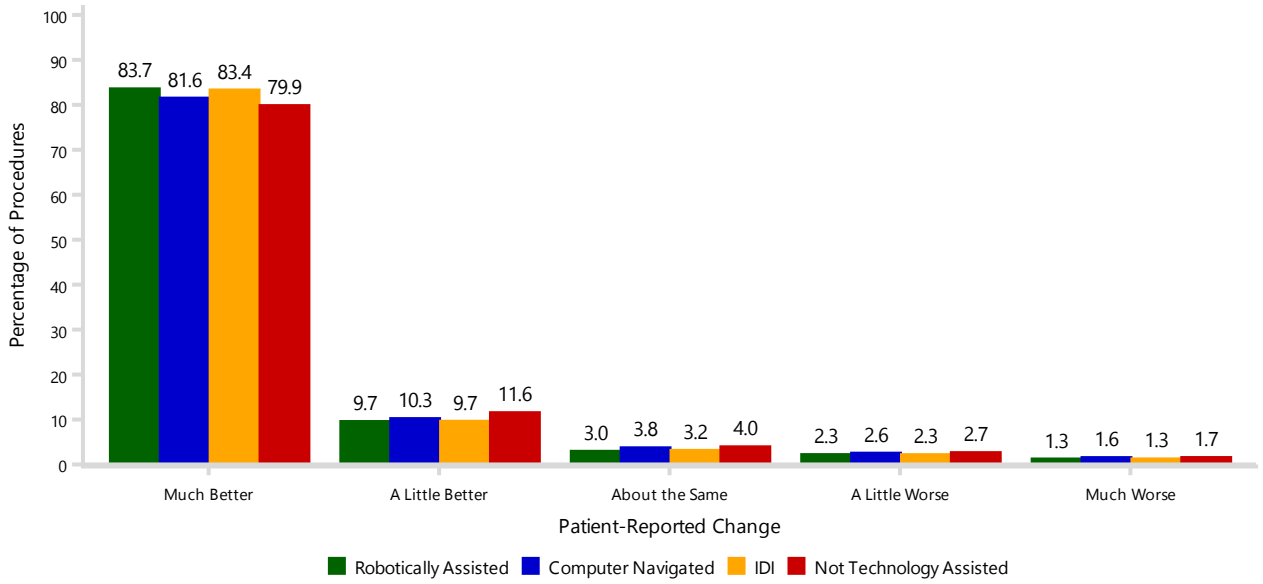
Note: Restricted to modern prostheses

Table SPR39 Patient-Reported Change after Primary Total Knee Replacement by Technology Assistance (Primary Diagnosis OA)

Technology Assistance	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Robotically Assisted	8129	83.7	27.4	939	9.7	24.5	295	3.0	22.4	224	2.3	24.2	129	1.3	23.3	9716	100.0	26.8
Computer Navigated	7524	81.6	25.4	951	10.3	24.8	352	3.8	26.8	242	2.6	26.2	151	1.6	27.3	9220	100.0	25.4
IDI	3424	83.4	11.5	399	9.7	10.4	133	3.2	10.1	94	2.3	10.2	55	1.3	9.9	4105	100.0	11.3
Not Technology Assisted	10599	79.9	35.7	1542	11.6	40.3	535	4.0	40.7	364	2.7	39.4	219	1.7	39.5	13259	100.0	36.5
TOTAL	**29676**	**81.8**	**100.0**	**3831**	**10.6**	**100.0**	**1315**	**3.6**	**100.0**	**924**	**2.5**	**100.0**	**554**	**1.5**	**100.0**	**36300**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR38 Patient-Reported Change after Primary Total Knee Replacement by Technology Assistance (Primary Diagnosis OA)



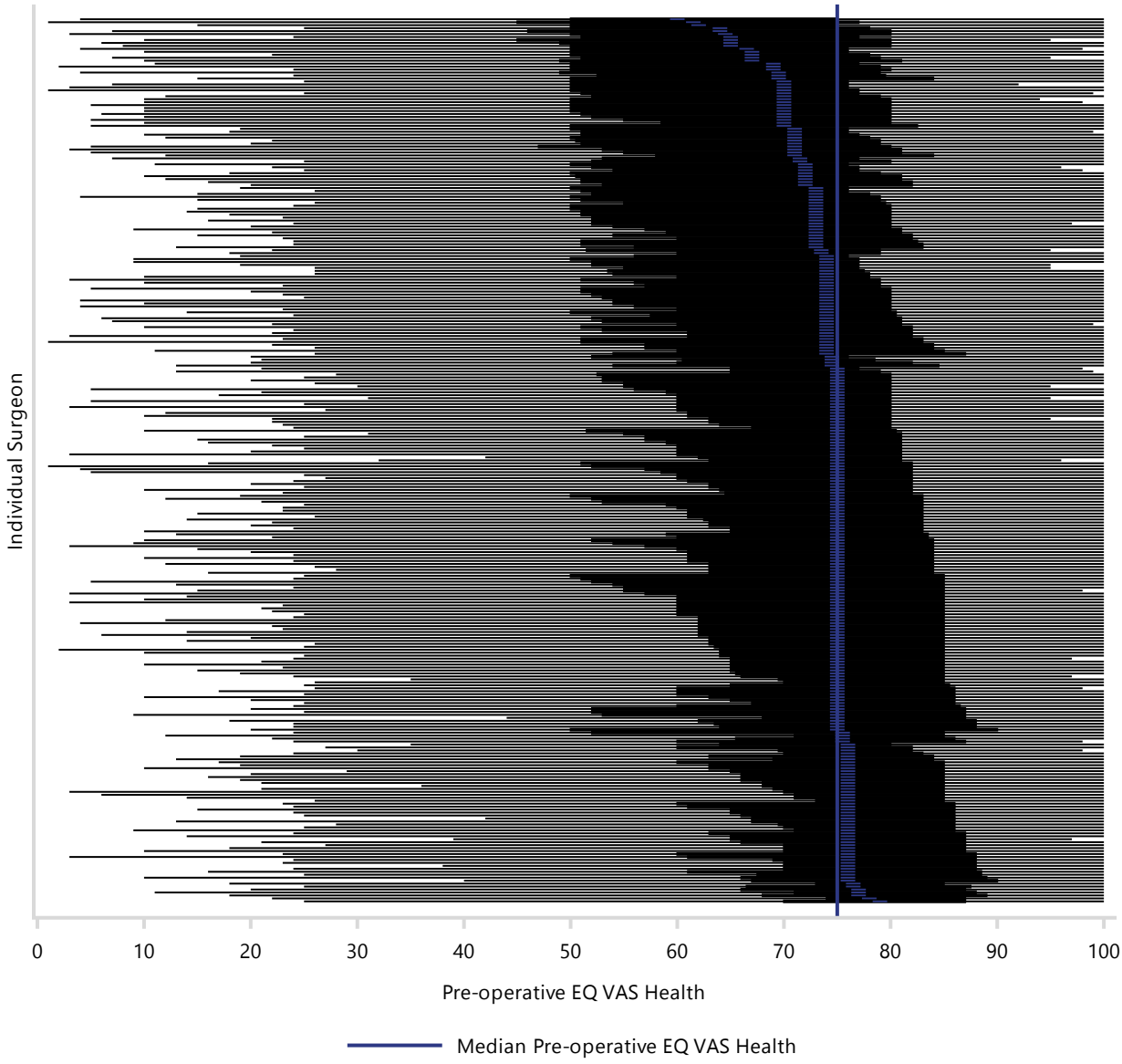
Note: Restricted to modern prostheses

SURGEON AND HOSPITAL PROMS

EQ-VAS

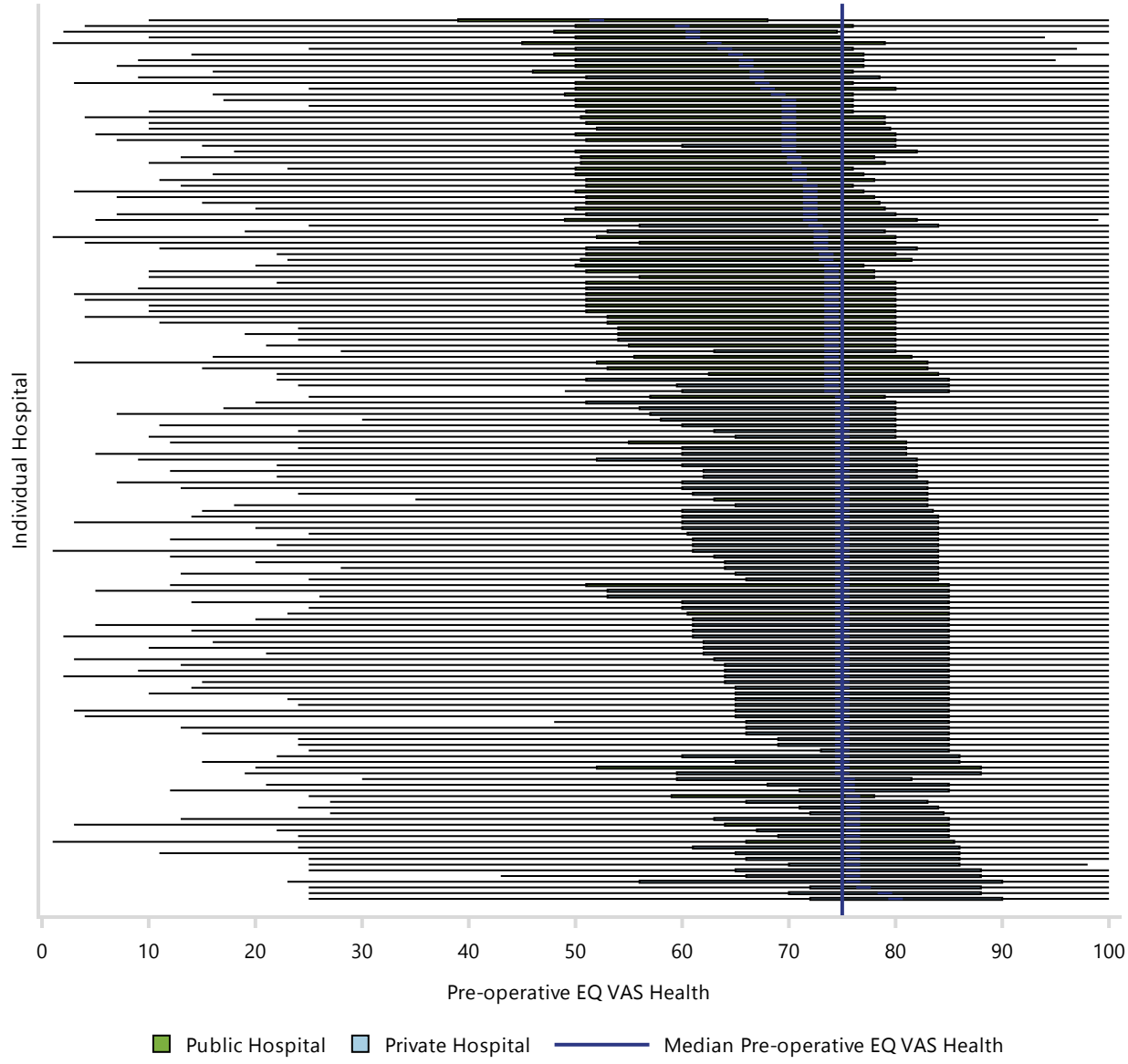
Variation between surgeons and between hospitals in the EQ-VAS is displayed as 'caterpillar plots' for surgeons and hospitals with at least 50 recorded cases for knee replacement (Figure SPR39 to Figure SPR40). These analyses show pre-operative quality of life assessments for patients of individual surgeons or hospitals compared to the median value represented by the vertical blue line. The median for each surgeon is shown as a blue square, the interquartile range is coloured brown, while the entire range is shown by the grey bar. For the hospital analysis private and public hospitals are coloured blue and yellow, respectively. All surgeons and most hospitals have an interquartile range that includes the group median value. Most public hospitals have median values below the group median, indicating a comparatively lower preoperative quality of life for these patients.

Figure SPR39 Pre-Operative EQ VAS Health in Primary Total Knee Replacement by Surgeon (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only surgeons with at least 50 procedures have been shown
The median pre-operative EQ-VAS Health is 75

Figure SPR40 Pre-Operative EQ-VAS Health in Primary Total Knee Replacement by Hospital (Primary Diagnosis OA)

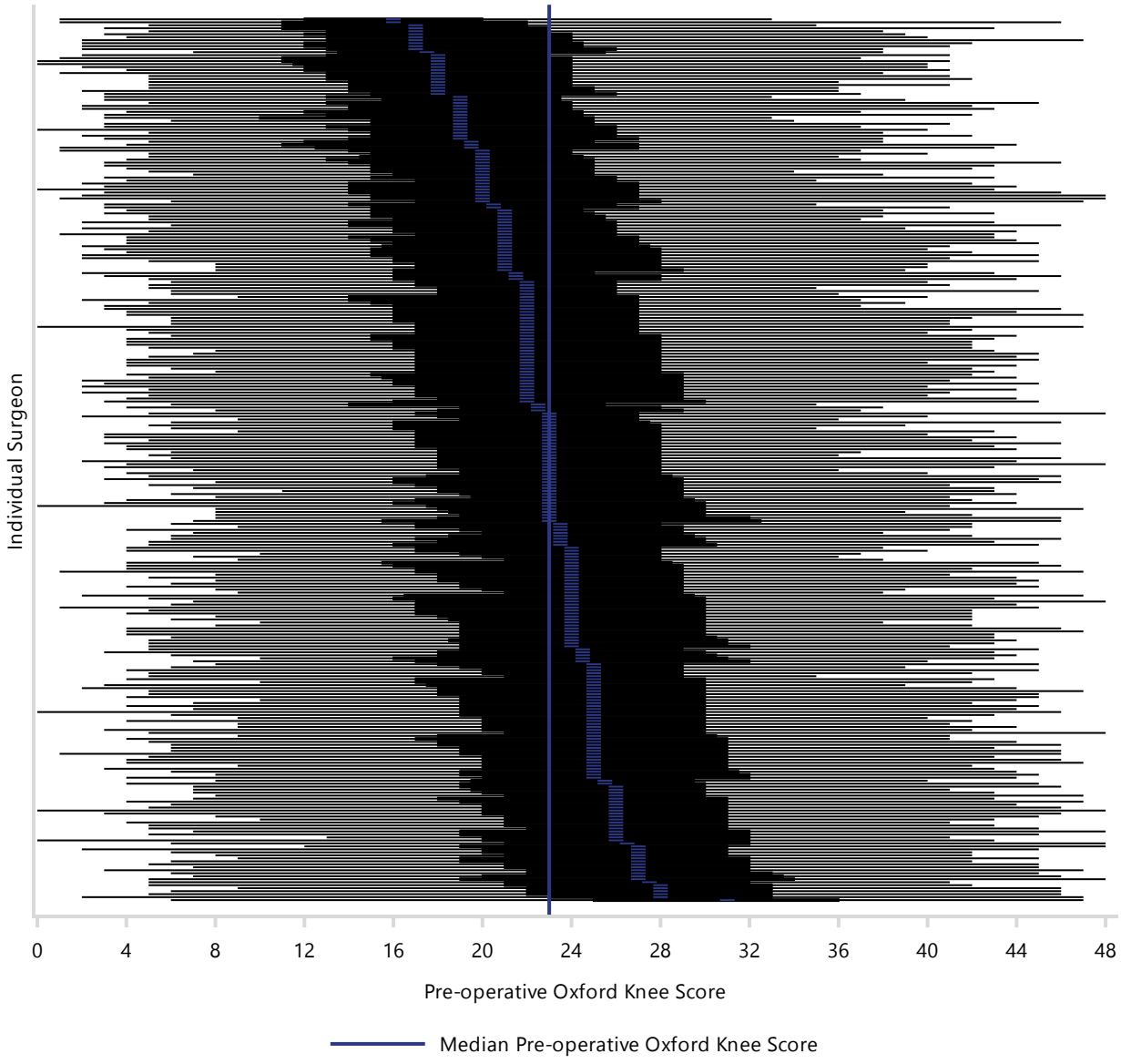


Note: Restricted to modern prostheses
Only hospitals with at least 50 procedures have been shown
The median pre-operative EQ-VAS Health is 75

Oxford Score

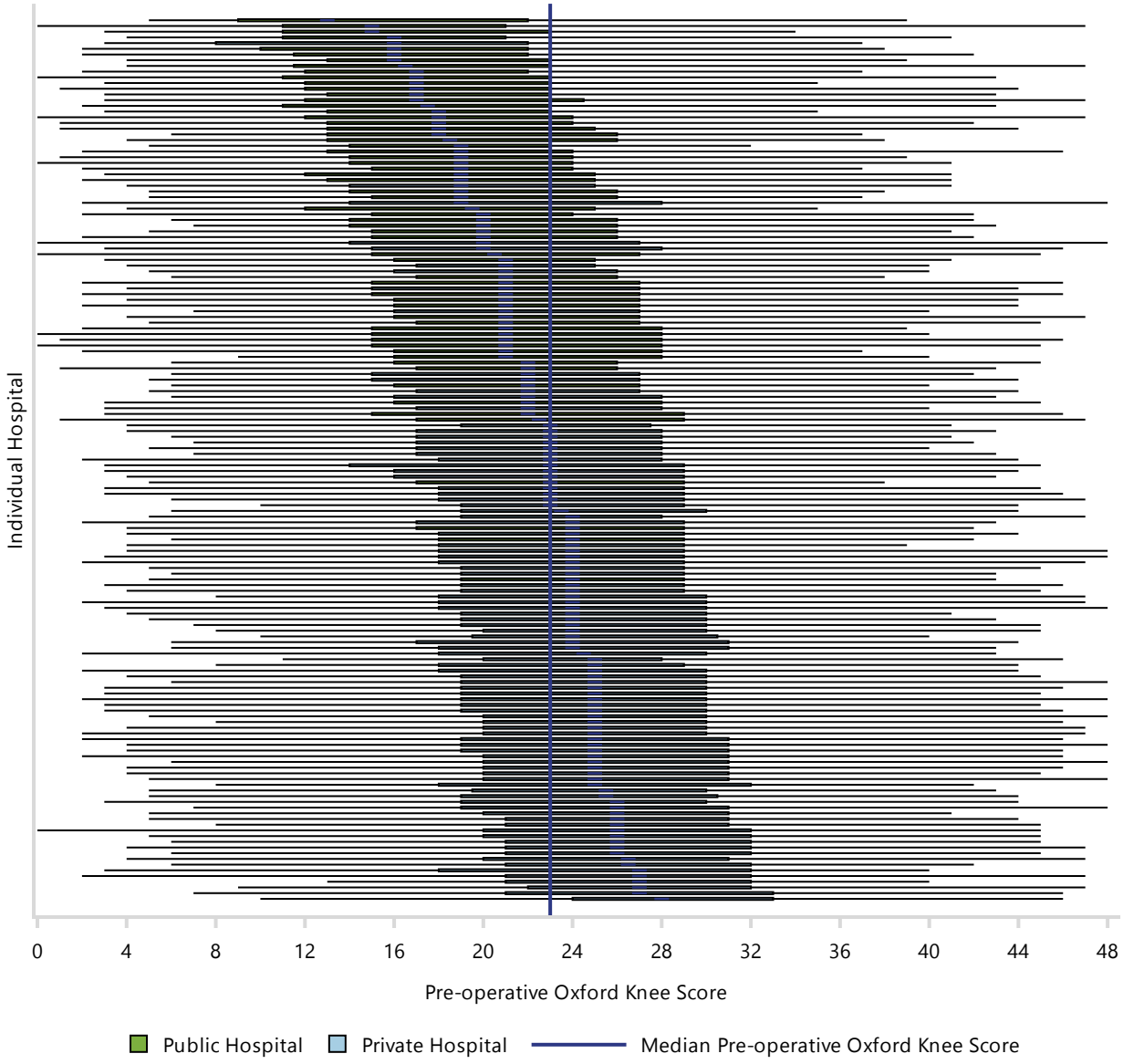
Comparisons of pre-operative Oxford Scores between hospitals and between surgeons for primary total knee replacement are shown in Figure SPR41 to Figure SPR42. Individual medians are shown as blue squares, compared to the group median represented by the vertical blue line. Like the EQ-VAS analysis, public hospital patients generally have lower median preoperative oxford knee scores compared to the national median.

Figure SPR41 Pre-Operative Oxford Knee Score in Primary Total Knee Replacement by Surgeon (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only surgeons with at least 50 procedures have been shown
The median pre-operative Oxford Knee Score is 23

Figure SPR42 Pre-Operative Oxford Knee Score in Primary Total Knee Replacement by Hospital (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Only hospitals with at least 50 procedures have been shown
The median pre-operative Oxford Knee Score is 23

Shoulder Summary

In this section, PROMs outcomes for primary total stemmed anatomic and primary total stemmed reverse shoulder replacement overall are compared.

More detailed analyses of the association between patient factors and PROMs for stemmed reverse shoulder replacement used for the management of osteoarthritis and rotator cuff arthropathy are also presented. However, similar detailed analyses for total stemmed anatomic and total stemless shoulder replacement are not yet available, due to limited data for these classes of prostheses.

There are insufficient data to report surgeon and hospital variation in pre-operative Oxford Scores between hospitals and between surgeons for total stemmed shoulder replacements.

COMPARISON OF PRIMARY TOTAL STEMMED ANATOMIC AND PRIMARY TOTAL STEMMED REVERSE SHOULDER REPLACEMENT

The EQ-VAS and EQ-5D-5L are measures of quality of life. EQ-VAS is a measure of patient reported health, and ranges from 0 (worst health imaginable) to 100 (best health imaginable).

Total stemmed anatomic shoulder replacement has a similar pre-operative EQ-VAS to that observed for total stemmed reverse procedures. The mean improvement in EQ-VAS score following surgery is similar for both classes of shoulder replacement (Table SPR40 and Figure SPR43).

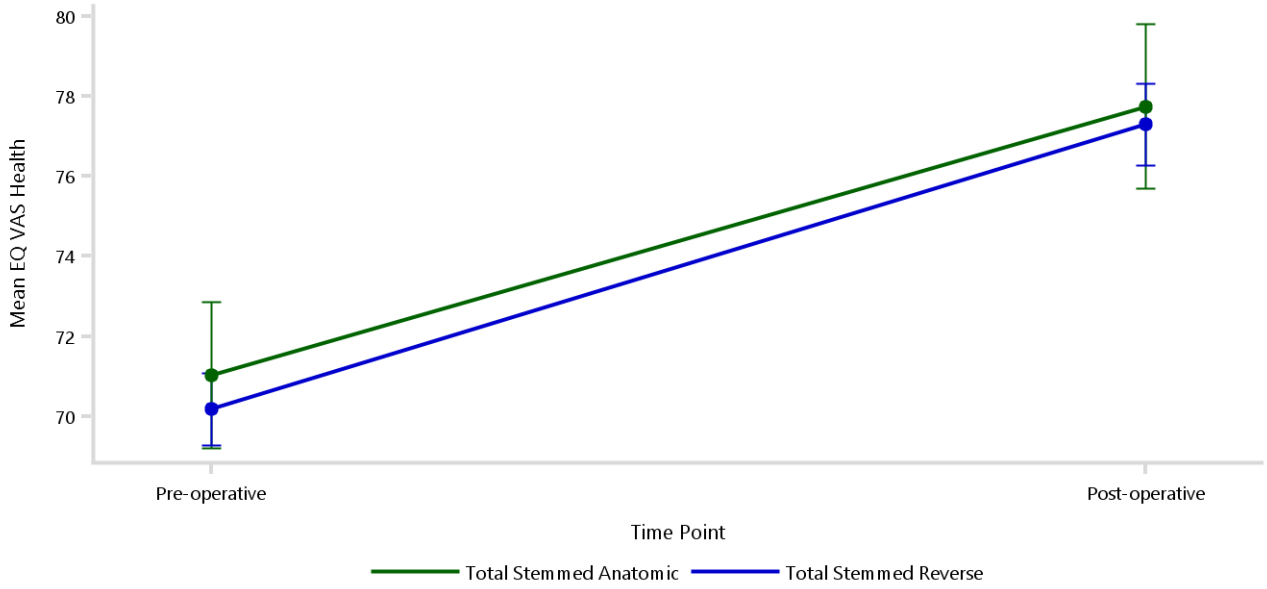
The percentage of total stemmed anatomic shoulder replacement patients who reported being better, worse or no different post-operatively compared to their pre-operative response for each of the EQ-5D domains and the EQ-VAS is shown in Figure SPR44. The corresponding percentages for patients who underwent primary total stemmed reverse shoulder replacement are shown in Figure SPR49.

Table SPR40 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)

Type of Primary	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Total Stemmed Anatomic	387	71.02 (69.19, 72.85)	265	77.75 (75.69, 79.81)	6.73 (4.53, 8.93)
Total Stemmed Reverse	1562	70.18 (69.28, 71.09)	1080	77.29 (76.28, 78.30)	7.11 (6.01, 8.21)

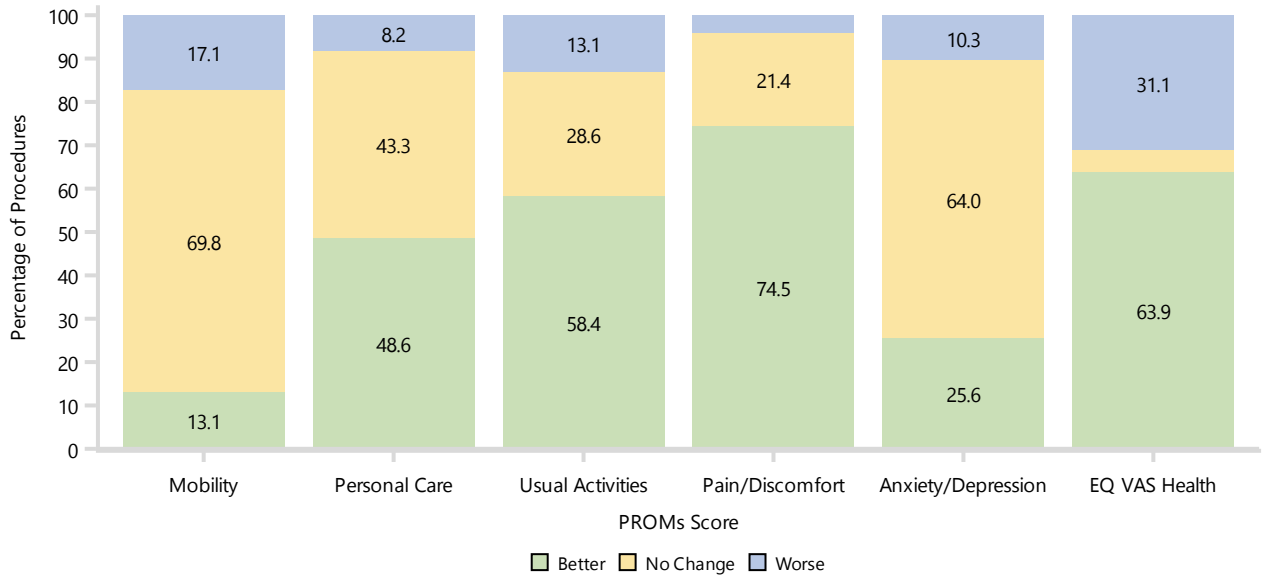
Note: Restricted to modern prostheses
Adjusted for age and gender

Figure SPR43 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age and gender

Figure SPR44 Change in EQ-5D-5L Domain Score and EQ-VAS Health in Primary Total Stemmed Anatomic Shoulder Replacement (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Oxford Score

The Oxford Shoulder Score (OSS) provides a joint specific score of pain and function. The OSS totals the responses from 12 questions, each on a 5-level scale of 0 (worst possible score) to 4 (best possible score). OSS scores before and 6 months after surgery for the two shoulder classes are provided in Table SPR41 and shown graphically in Figure SPR45. The mean preoperative Oxford scores were 23.8 and 23.6 for total stemmed anatomic and total stemmed reverse shoulder replacements, while the postoperative mean scores were 39.2 and 39.1 for these groups, respectively.

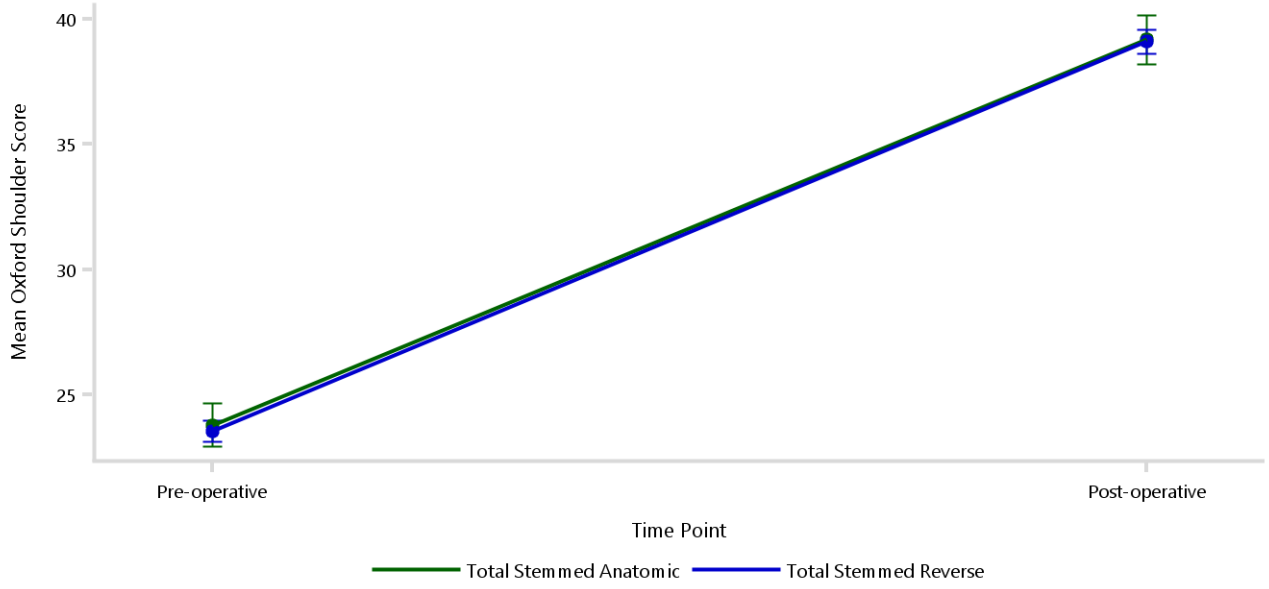
There is no difference in the pre- or post-operative score between shoulder classes and the mean change in score is just over 15 points.

Table SPR41 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)

Type of Primary	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Total Stemmed Anatomic	385	23.78 (22.91, 24.64)	266	39.18 (38.21, 40.15)	15.40 (14.30, 16.51)
Total Stemmed Reverse	1569	23.55 (23.12, 23.97)	1082	39.11 (38.63, 39.58)	15.56 (15.01, 16.11)

Note: Restricted to modern prostheses
Adjusted for age and gender

Figure SPR45 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age and gender

Patient Satisfaction and Change

Patients were surveyed at 6 months post-operatively on how satisfied they were with their primary total stemmed shoulder replacement, and on their perceived change in their shoulder after surgery.

After primary total stemmed anatomic shoulder replacement, 88.3% of patients were either very satisfied or satisfied. After primary total stemmed reverse shoulder replacement, 87.5% of patients were either very satisfied or satisfied (Table SPR42 and Figure SPR46).

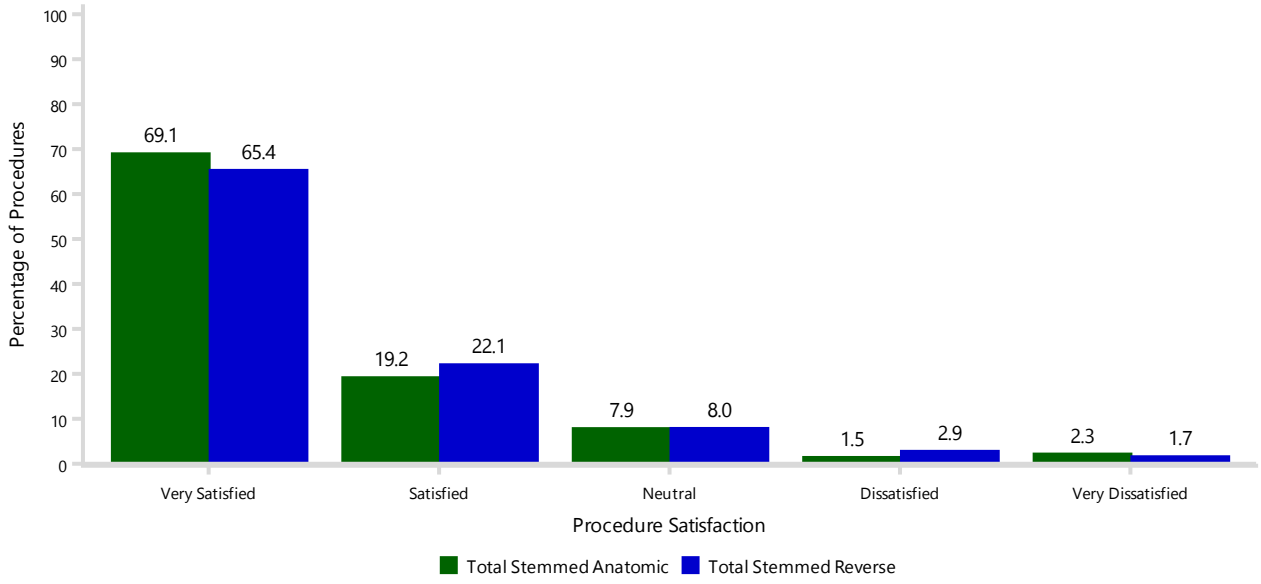
There was a high percentage (93.5%) of patients who rated their primary total stemmed anatomic shoulder replacement as much better or a little better. Similarly, patient-reported change after total stemmed reverse shoulder replacement was largely much better or a little better (93.4%) (Table SPR43 and Figure SPR47).

Table SPR42 Procedure Satisfaction in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)

Type of Primary	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Total Stemmed Anatomic	183	69.1	20.6	51	19.2	17.6	21	7.9	19.6	4	1.5	11.4	6	2.3	25.0	265	100.0	19.7
Total Stemmed Reverse	706	65.4	79.4	239	22.1	82.4	86	8.0	80.4	31	2.9	88.6	18	1.7	75.0	1080	100.0	80.3
TOTAL	**889**	**66.1**	**100.0**	**290**	**21.6**	**100.0**	**107**	**8.0**	**100.0**	**35**	**2.6**	**100.0**	**24**	**1.8**	**100.0**	**1345**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR46 Procedure Satisfaction in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)



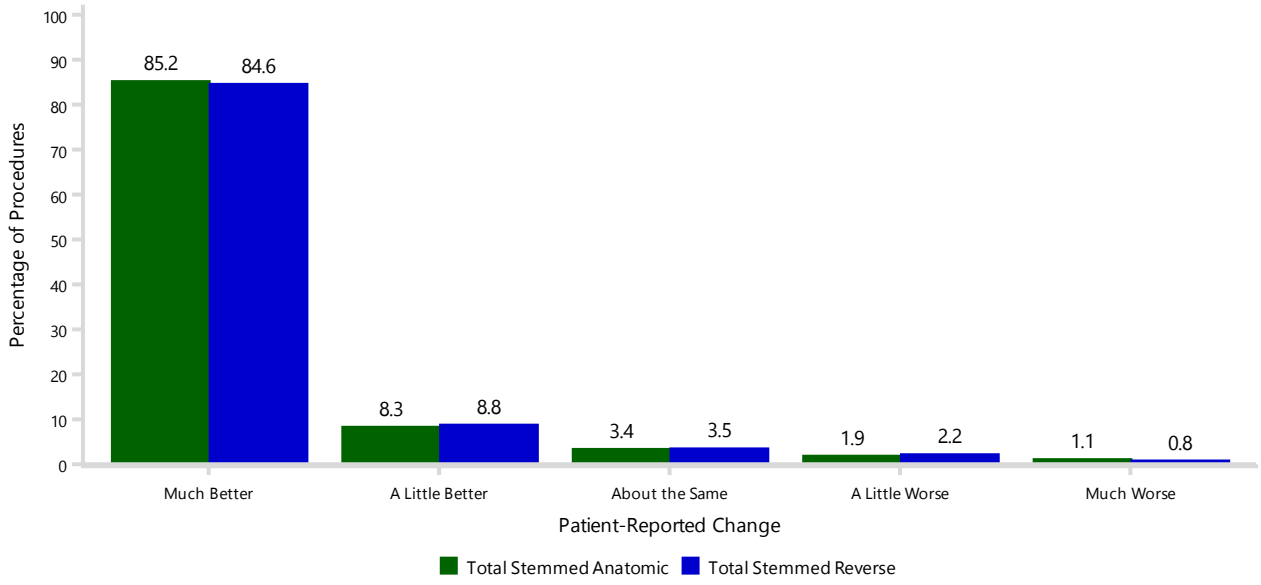
Note: Restricted to modern prostheses

Table SPR43 Patient-Reported Change in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)

Type of Primary	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%	N	Row %	Col%
Total Stemmed Anatomic	225	85.2	19.8	22	8.3	18.8	9	3.4	19.1	5	1.9	17.2	3	1.1	25.0	264	100.0	19.7
Total Stemmed Reverse	913	84.6	80.2	95	8.8	81.2	38	3.5	80.9	24	2.2	82.8	9	0.8	75.0	1079	100.0	80.3
TOTAL	**1138**	**84.7**	**100.0**	**117**	**8.7**	**100.0**	**47**	**3.5**	**100.0**	**29**	**2.2**	**100.0**	**12**	**0.9**	**100.0**	**1343**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR47 Patient-Reported Change in Primary Total Stemmed Shoulder Replacement by Type of Primary (Primary Diagnosis OA)



Note: Restricted to modern prostheses

PRIMARY TOTAL STEMMED REVERSE SHOULDER REPLACEMENT FOR OSTEOARTHRITIS

PATIENT CHARACTERISTICS

EQ-VAS and EQ-5D-5L

The mean EQ-VAS score increased by 7 points following total stemmed reverse shoulder replacement for osteoarthritis (Table SPR44). The percentage change following surgery is shown in Figure SPR48, and the change in each domain of the EQ-5D-5L is shown in Figure SPR49.

Age <65 years and female gender are associated with lower pre-operative EQ-VAS scores. Improvement after surgery is greater for females (Table SPR45, Figure SPR50, Table SPR46 and Figure SPR51).

EQ-VAS for ASA scores 2 and 3 are reported. The pre-operative mean EQ-VAS is lower for ASA score 3 and the post operative EQ-VAS was also lower, but the magnitude of improvement is greater (Table SPR47 and Figure SPR52).

Compared to normal weight patients, patients with increasing obesity have lower mean pre- and post-operative EQ-VAS but larger improvements (Table SPR48 and Figure SPR53).

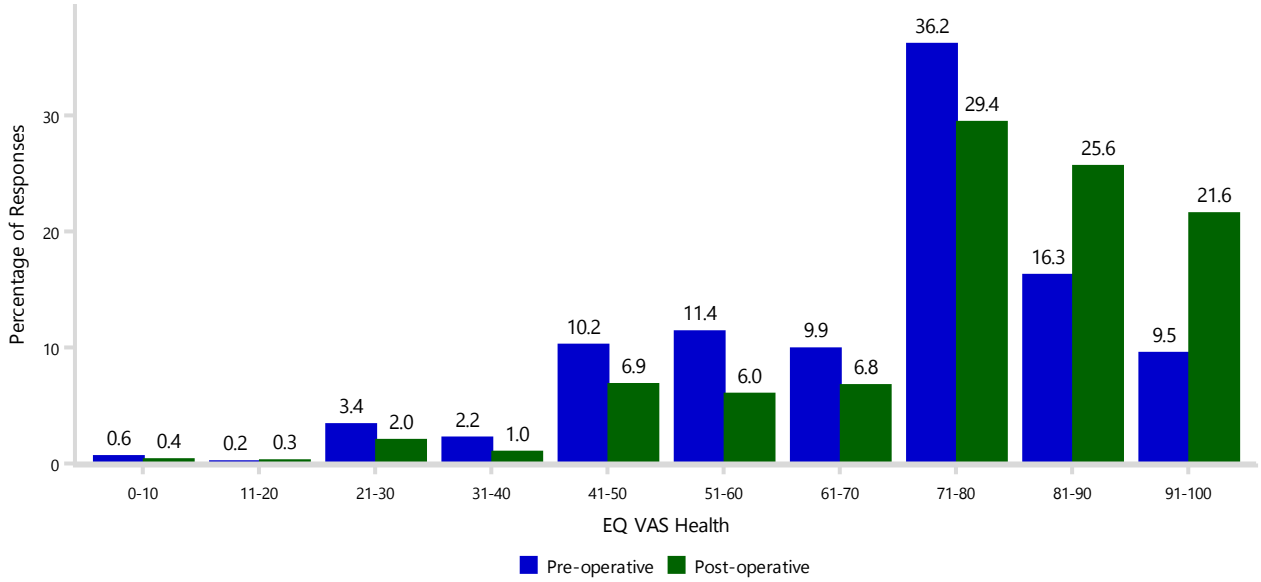
Glenoid morphology does not appear to impact the pre-operative mean EQ-VAS. The mean change in score is greatest for the B2 category (Table SPR49 and Figure SPR54).

Table SPR44 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Stemmed Reverse	1562	70.03±17.95	75.00 (59.00, 82.00)	1080	77.35±17.37	80.00 (72.00, 90.00)

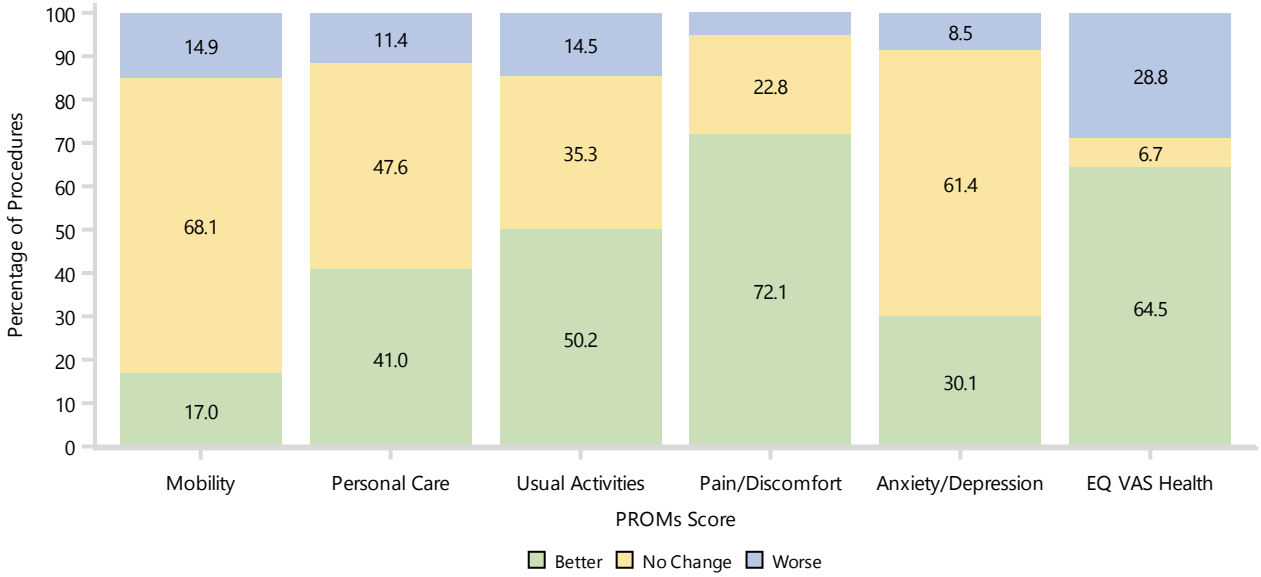
Note: Restricted to modern prostheses

Figure SPR48 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)



Note: Restricted to modern prostheses

Figure SPR49 Change in EQ-5D-5L Domain Score and EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)



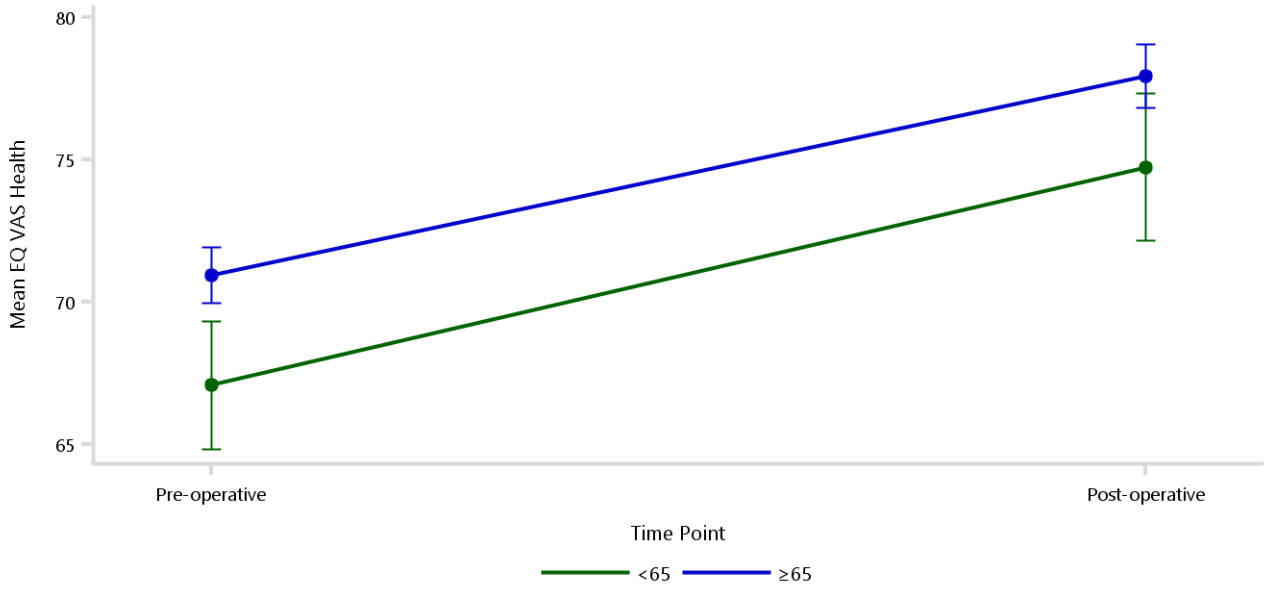
Note: Restricted to modern prostheses

Table SPR45 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)

Age	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<65	238	67.10 (64.84, 69.35)	164	74.75 (72.17, 77.34)	7.66 (4.85, 10.46)
≥65	1324	70.96 (69.98, 71.93)	916	77.94 (76.83, 79.05)	6.98 (5.78, 8.19)

Note: Restricted to modern prostheses
Adjusted for gender

Figure SPR50 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)



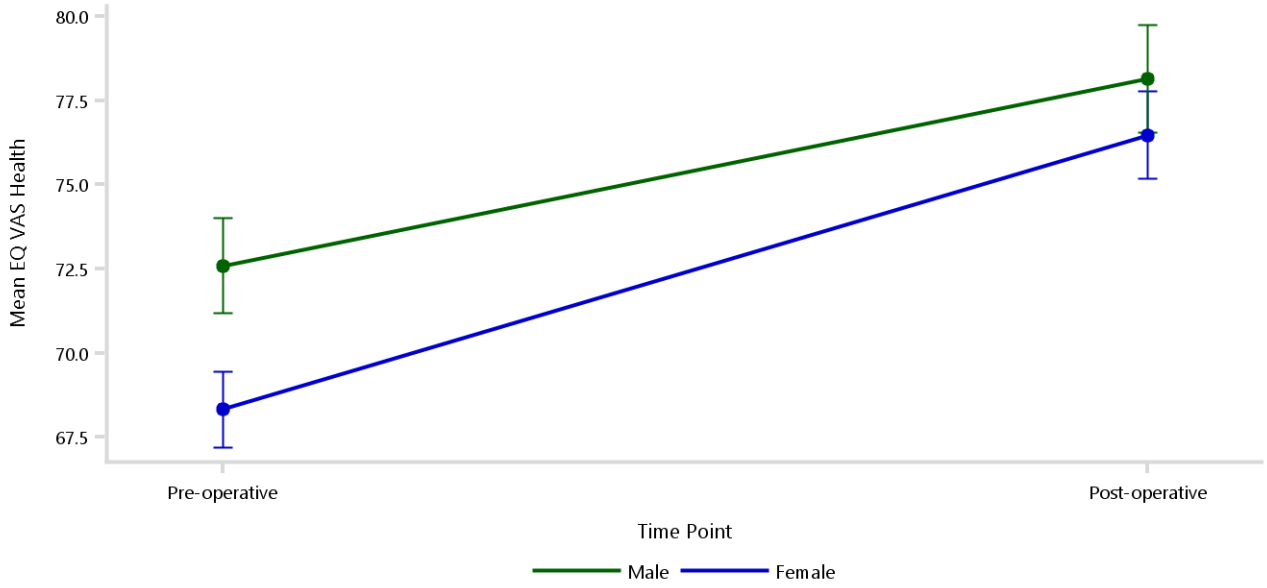
Note: Restricted to modern prostheses
Adjusted for gender

Table SPR46 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	615	72.59 (71.18, 74.00)	433	78.13 (76.54, 79.73)	5.54 (3.80, 7.28)
Female	947	68.33 (67.19, 69.46)	647	76.48 (75.17, 77.78)	8.15 (6.72, 9.58)

Note: Restricted to modern prostheses
Adjusted for age

Figure SPR51 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)



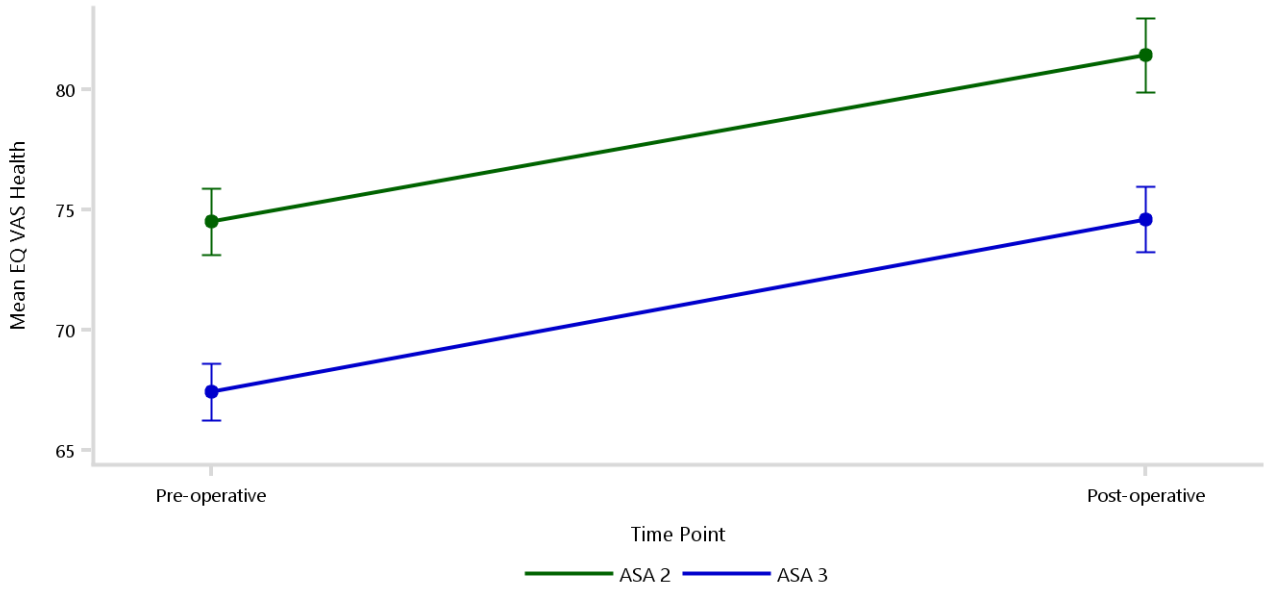
Note: Restricted to modern prostheses
Adjusted for age

Table SPR47 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 2	630	74.52 (73.14, 75.90)	453	81.44 (79.90, 82.98)	6.92 (5.25, 8.60)
ASA 3	861	67.44 (66.27, 68.62)	575	74.61 (73.25, 75.96)	7.17 (5.68, 8.65)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Figure SPR52 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis OA)



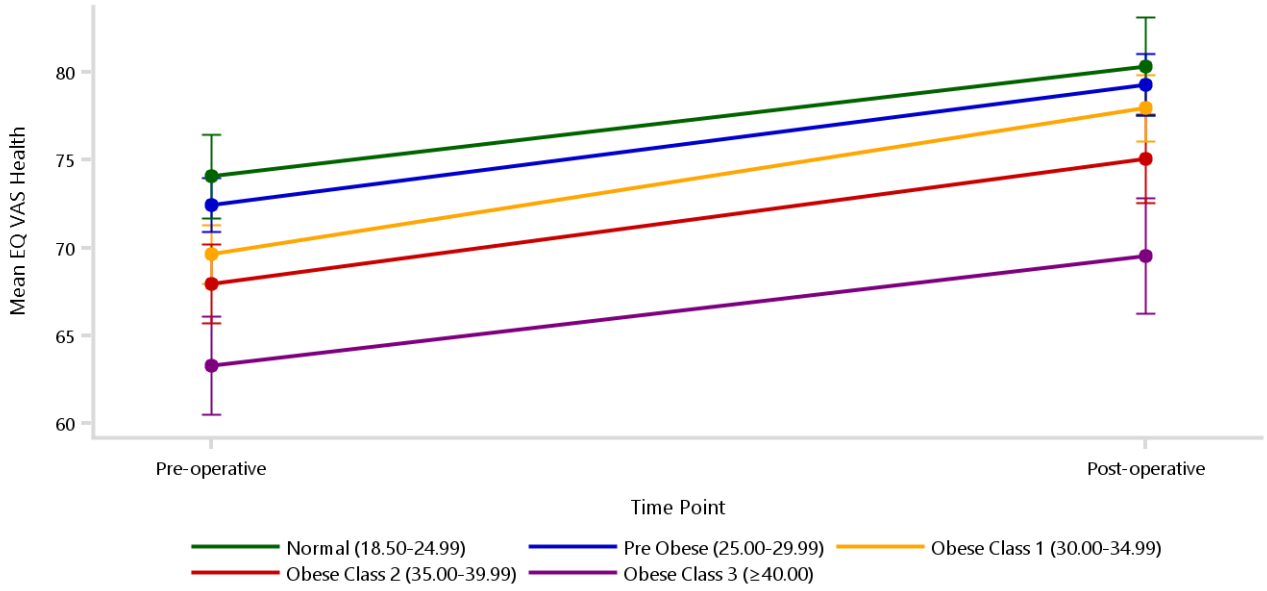
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Table SPR48 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Normal (18.50-24.99)	215	74.07 (71.69, 76.44)	138	80.31 (77.51, 83.12)	6.25 (3.20, 9.30)
Pre Obese (25.00-29.99)	499	72.45 (70.91, 73.99)	352	79.28 (77.53, 81.03)	6.83 (4.89, 8.77)
Obese Class 1 (30.00-34.99)	431	69.64 (67.98, 71.30)	301	77.95 (76.06, 79.85)	8.32 (6.21, 10.43)
Obese Class 2 (35.00-39.99)	237	67.97 (65.72, 70.21)	175	75.07 (72.56, 77.57)	7.10 (4.32, 9.87)
Obese Class 3 (≥40.00)	158	63.28 (60.49, 66.07)	103	69.54 (66.26, 72.81)	6.26 (2.71, 9.81)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Figure SPR53 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis OA)



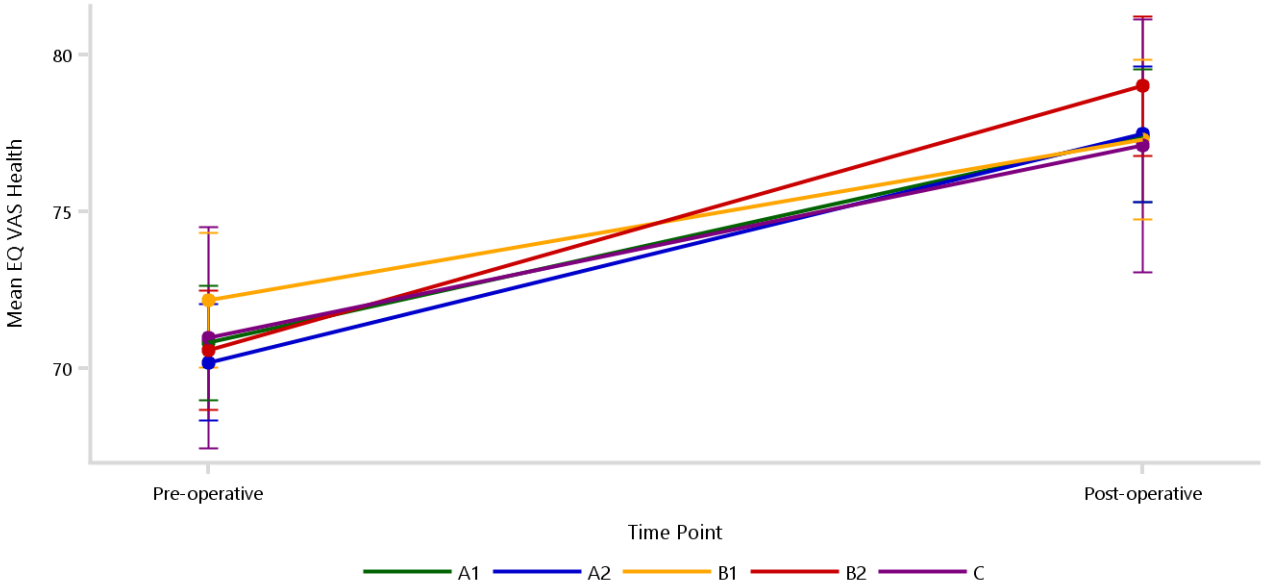
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Table SPR49 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis OA)

Glenoid Morphology	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
A1	365	70.82 (69.00, 72.64)	253	77.41 (75.30, 79.52)	6.59 (4.31, 8.88)
A2	341	70.20 (68.34, 72.06)	237	77.47 (75.31, 79.63)	7.27 (4.92, 9.61)
B1	255	72.18 (70.03, 74.34)	171	77.30 (74.76, 79.83)	5.11 (2.37, 7.86)
B2	323	70.59 (68.68, 72.49)	223	79.00 (76.79, 81.22)	8.42 (6.01, 10.83)
C	94	70.98 (67.45, 74.50)	68	77.10 (73.08, 81.12)	6.12 (1.69, 10.55)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Figure SPR54 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Oxford Score

The Oxford Shoulder Scores (OSS) before and 6 months after surgery are provided in Table SPR50.

Lower pre-operative mean OSS are associated with female gender. Higher post-operative scores occur in all subgroups compared to pre-operative, but the amount of change is greater for females and patients aged ≥65 years (Table SPR51, Figure SPR55, Table SPR52 and Figure SPR56).

OSS for ASA score 2 and ASA score 3 are presented. Pre-operative mean Oxford scores are lower for ASA score 3 and mean improvement after surgery is similar (Table SPR53 and Figure SPR57).

The pre-operative mean Oxford score is similar for the different BMI categories. The largest change in mean Oxford score is in obese class 2 and obese class 3 (Table SPR54 and Figure SPR58).

The pre- and post-operative OSS is not affected by glenoid morphology (Table SPR55 and Figure SPR59).

Table SPR50 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Stemmed Reverse	1569	23.26±8.80	23.00 (17.00, 30.00)	1082	38.96±7.91	41.00 (35.00, 45.00)

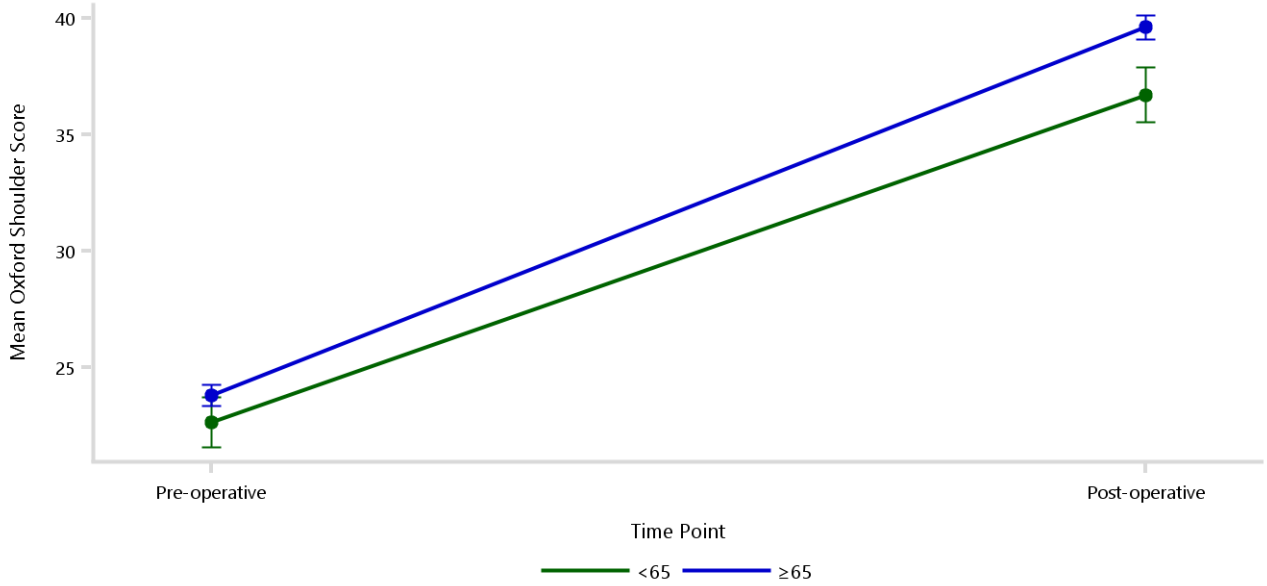
Note: Restricted to modern prostheses

Table SPR51 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)

Age	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<65	237	22.62 (21.54, 23.69)	164	36.70 (35.52, 37.89)	14.09 (12.71, 15.46)
≥65	1332	23.79 (23.33, 24.26)	918	39.61 (39.10, 40.12)	15.82 (15.23, 16.40)

Note: Restricted to modern prostheses
Adjusted for gender

Figure SPR55 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)



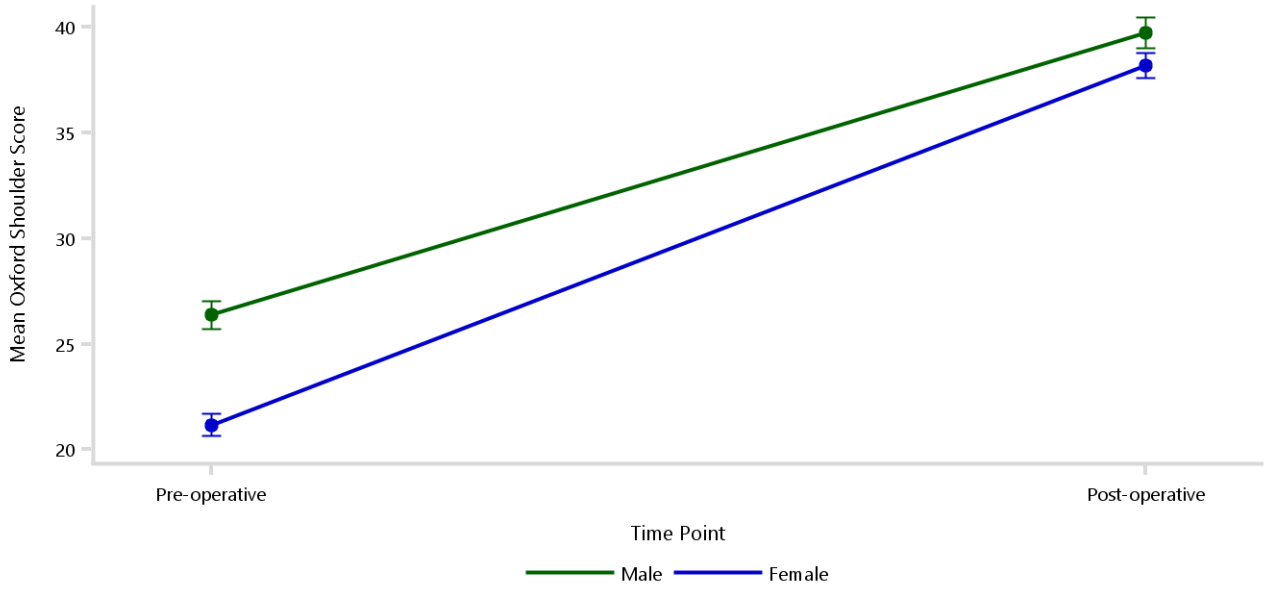
Note: Restricted to modern prostheses
Adjusted for gender

Table SPR52 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	618	26.38 (25.71, 27.04)	434	39.75 (39.02, 40.47)	13.37 (12.53, 14.21)
Female	951	21.17 (20.63, 21.71)	648	38.18 (37.59, 38.77)	17.01 (16.32, 17.70)

Note: Restricted to modern prostheses
Adjusted for age

Figure SPR56 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)



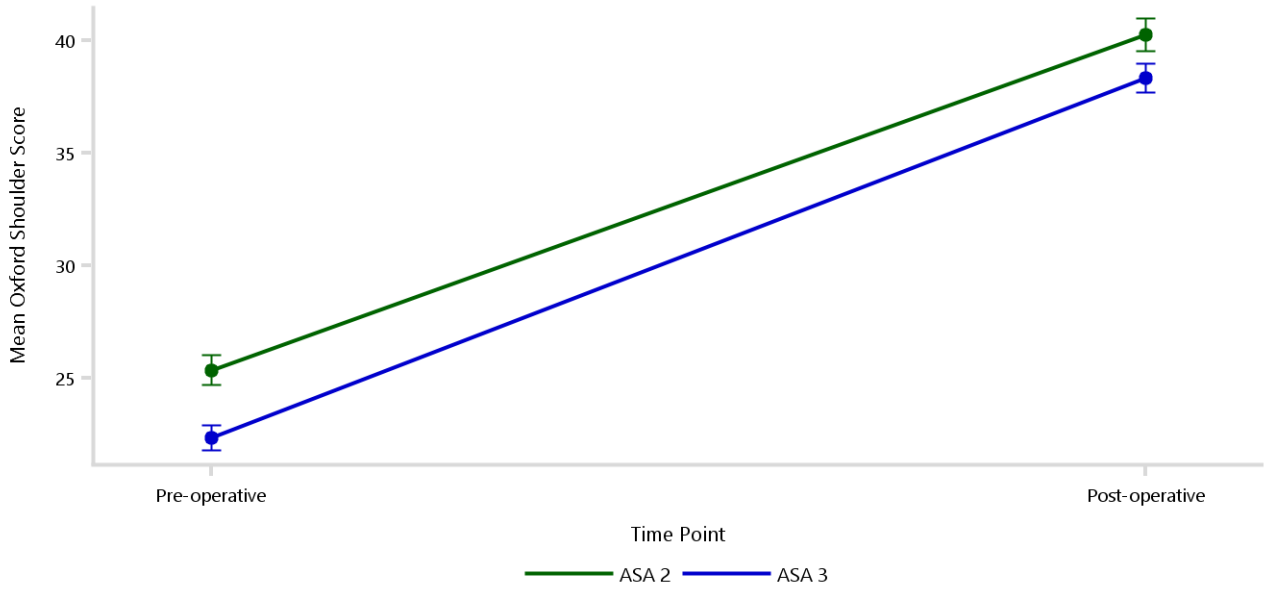
Note: Restricted to modern prostheses
Adjusted for age

Table SPR53 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis OA)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 2	632	25.35 (24.69, 26.00)	453	40.25 (39.53, 40.98)	14.90 (14.06, 15.74)
ASA 3	868	22.34 (21.78, 22.90)	577	38.31 (37.67, 38.95)	15.98 (15.24, 16.72)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Figure SPR57 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis OA)



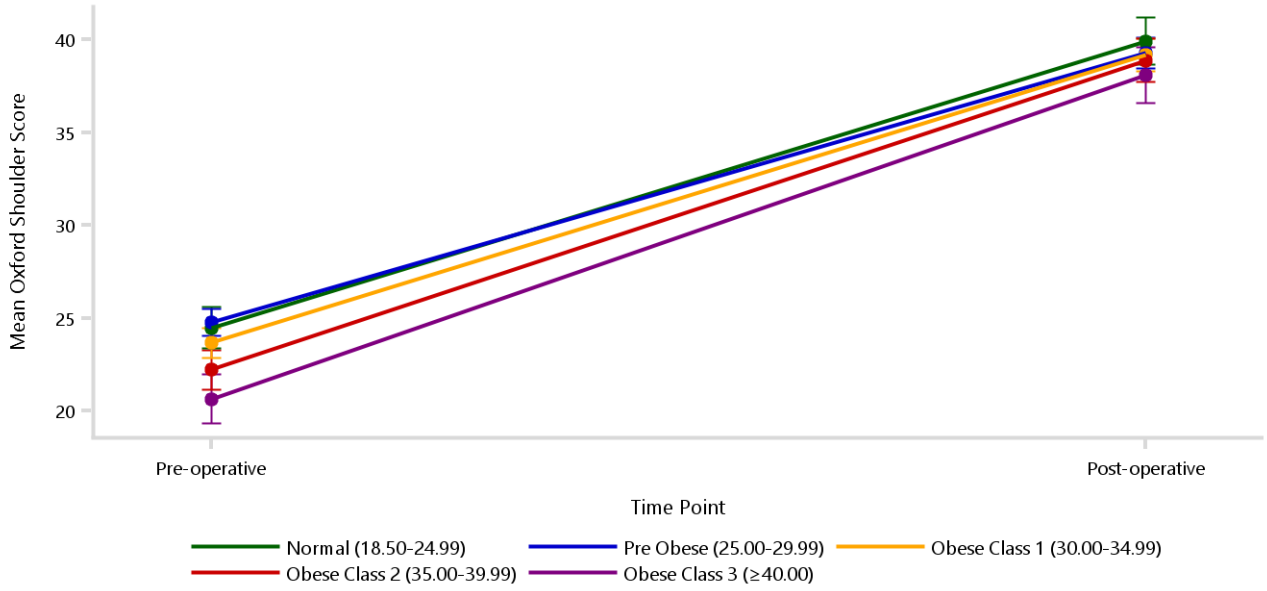
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Table SPR54 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis OA)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Normal (18.50-24.99)	219	24.48 (23.36, 25.61)	144	39.93 (38.65, 41.20)	15.44 (13.98, 16.91)
Pre Obese (25.00-29.99)	497	24.77 (24.03, 25.50)	348	39.30 (38.48, 40.11)	14.53 (13.57, 15.48)
Obese Class 1 (30.00-34.99)	435	23.67 (22.88, 24.46)	300	39.20 (38.32, 40.09)	15.53 (14.50, 16.56)
Obese Class 2 (35.00-39.99)	236	22.22 (21.15, 23.30)	176	38.89 (37.73, 40.04)	16.66 (15.31, 18.02)
Obese Class 3 (≥40.00)	160	20.65 (19.32, 21.97)	103	38.09 (36.57, 39.61)	17.44 (15.71, 19.18)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Figure SPR58 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis OA)



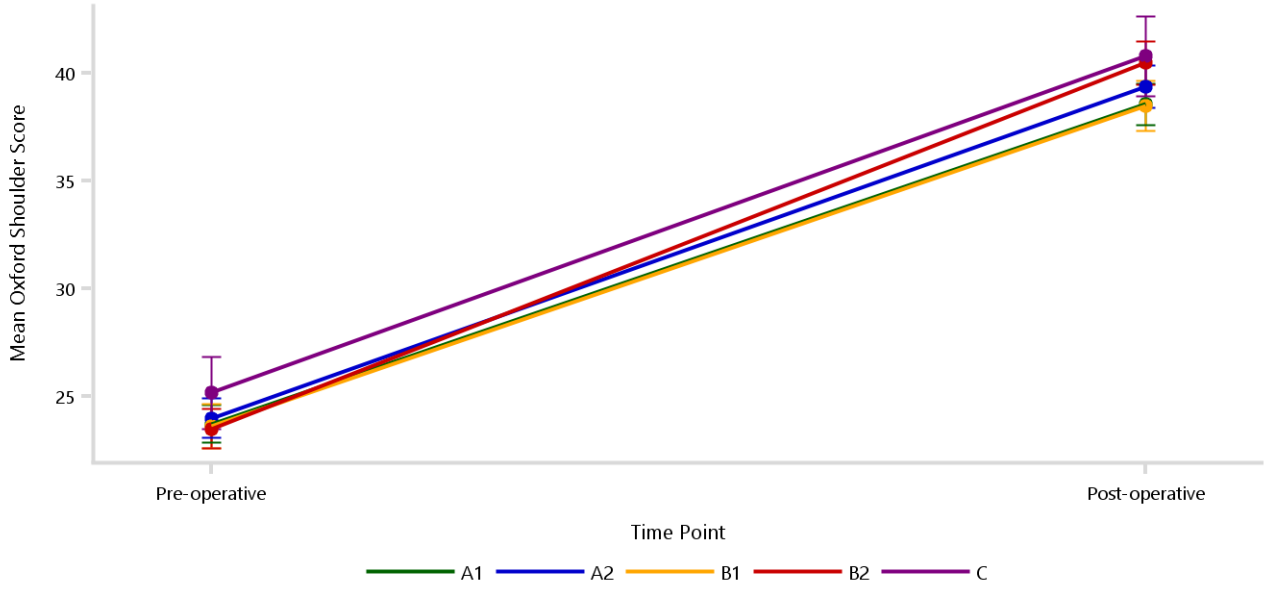
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Table SPR55 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis OA)

Glenoid Morphology	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
A1	368	23.72 (22.85, 24.60)	255	38.54 (37.59, 39.49)	14.81 (13.70, 15.93)
A2	335	23.98 (23.07, 24.89)	238	39.37 (38.40, 40.35)	15.39 (14.24, 16.55)
B1	257	23.62 (22.58, 24.66)	170	38.46 (37.31, 39.62)	14.84 (13.49, 16.19)
B2	328	23.50 (22.58, 24.42)	225	40.46 (39.46, 41.46)	16.96 (15.79, 18.14)
C	97	25.16 (23.47, 26.85)	66	40.77 (38.92, 42.61)	15.61 (13.43, 17.79)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Figure SPR59 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis OA)



Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Satisfaction and Change

Patients were surveyed at 6 months post-operatively on how satisfied they were with their total stemmed reverse shoulder replacement for osteoarthritis, and on their perceived change in their shoulder after surgery.

After total stemmed reverse shoulder replacement, 87.5 of patients are very satisfied or satisfied (Table SPR56).

Procedure satisfaction by age and gender are presented in Table SPR57, Figure SPR60, Table SPR58 and Figure SPR61.

Patient-reported change is a little better or much better in 93.4% of total stemmed reverse shoulders (Table SPR59 and Figure SPR62). Patient-reported change by age and gender are presented in Table SPR60, Figure SPR63, Table SPR61 and Figure SPR64.

Table SPR56 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)

Class	Very Satisfied		Satisfied		Neutral		Dissatisfied		Very Dissatisfied		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Stemmed Reverse	706	65.4	239	22.1	86	8.0	31	2.9	18	1.7	1080	100.0

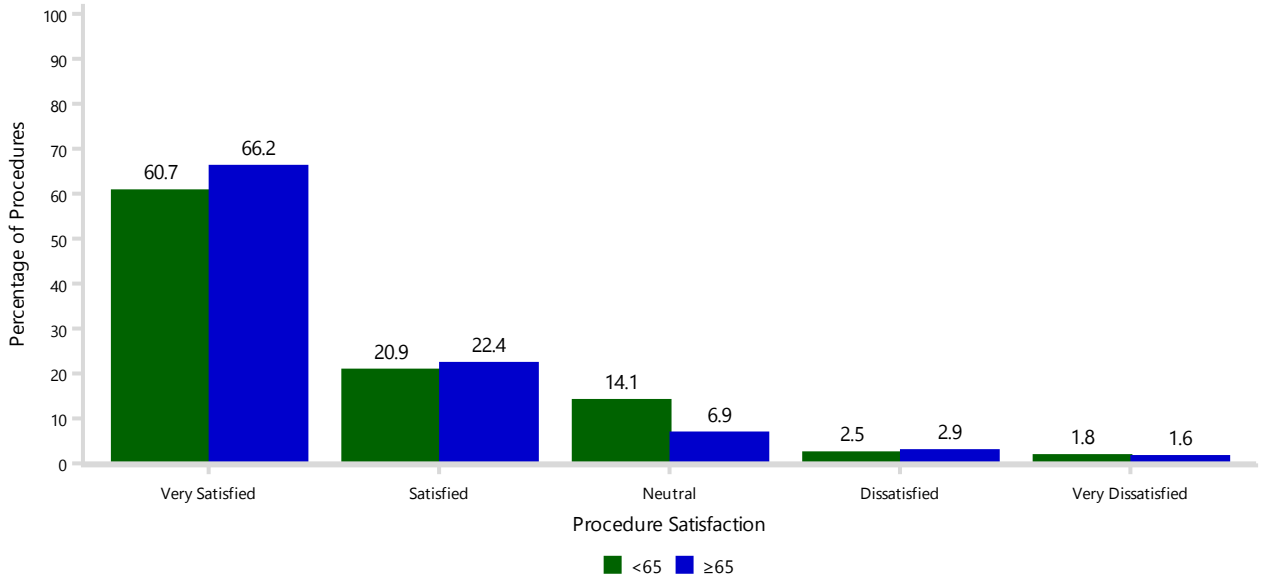
Note: Restricted to modern prostheses

Table SPR57 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)

Age	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row %	Col%	N	Row%	Col%	N	Row%	Col%
<65	99	60.7	14.0	34	20.9	14.2	23	14.1	26.7	4	2.5	12.9	3	1.8	16.7	163	100.0	15.1
≥65	607	66.2	86.0	205	22.4	85.8	63	6.9	73.3	27	2.9	87.1	15	1.6	83.3	917	100.0	84.9
TOTAL	**706**	**65.4**	**100.0**	**239**	**22.1**	**100.0**	**86**	**8.0**	**100.0**	**31**	**2.9**	**100.0**	**18**	**1.7**	**100.0**	**1080**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR60 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)



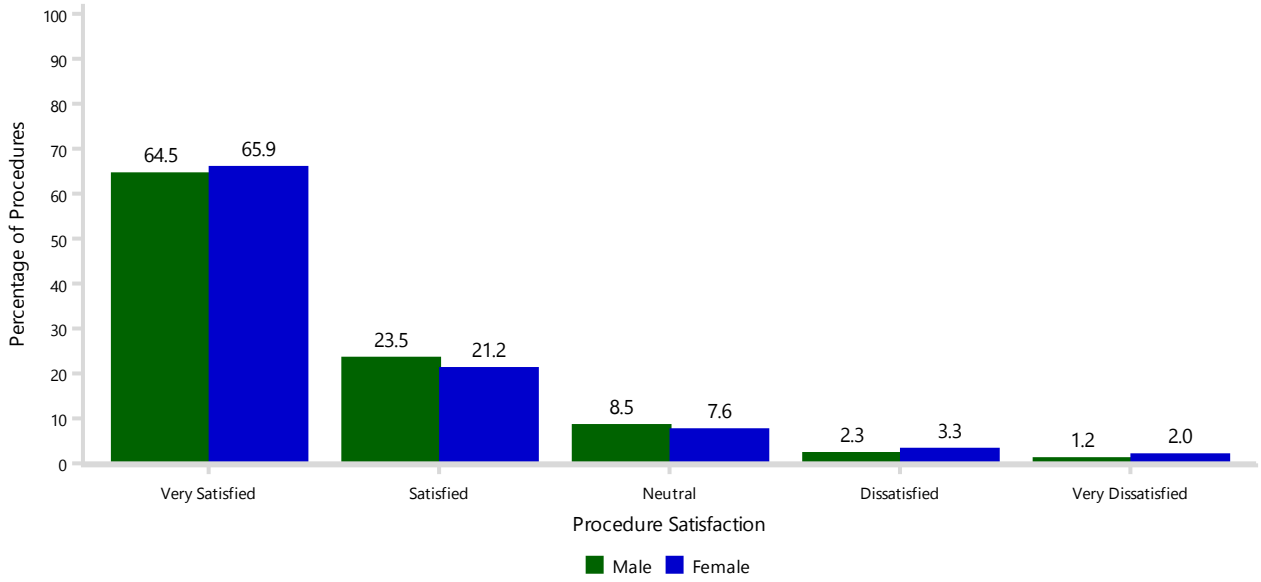
Note: Restricted to modern prostheses

Table SPR58 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Male	280	64.5	39.7	102	23.5	42.7	37	8.5	43.0	10	2.3	32.3	5	1.2	27.8	434	100.0	40.2
Female	426	65.9	60.3	137	21.2	57.3	49	7.6	57.0	21	3.3	67.7	13	2.0	72.2	646	100.0	59.8
TOTAL	**706**	**65.4**	**100.0**	**239**	**22.1**	**100.0**	**86**	**8.0**	**100.0**	**31**	**2.9**	**100.0**	**18**	**1.7**	**100.0**	**1080**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR61 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)



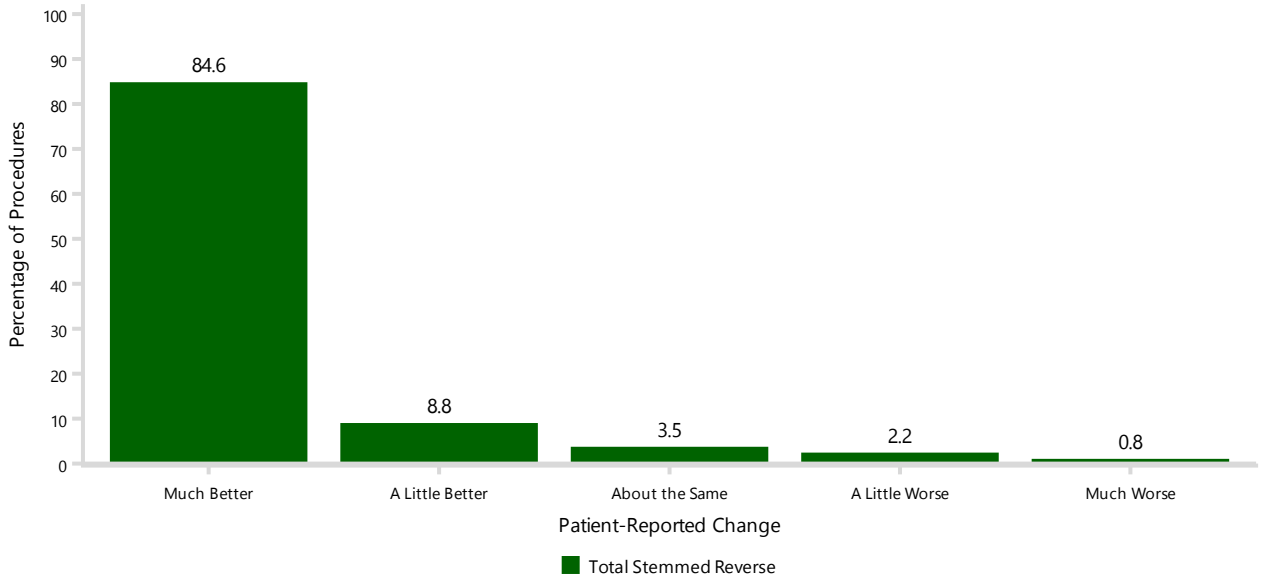
Note: Restricted to modern prostheses

Table SPR59 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)

Class	Much Better		A Little Better		About the Same		A Little Worse		Much Worse		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Stemmed Reverse	913	84.6	95	8.8	38	3.5	24	2.2	9	0.8	1079	100.0

Note: Restricted to modern prostheses

Figure SPR62 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis OA)



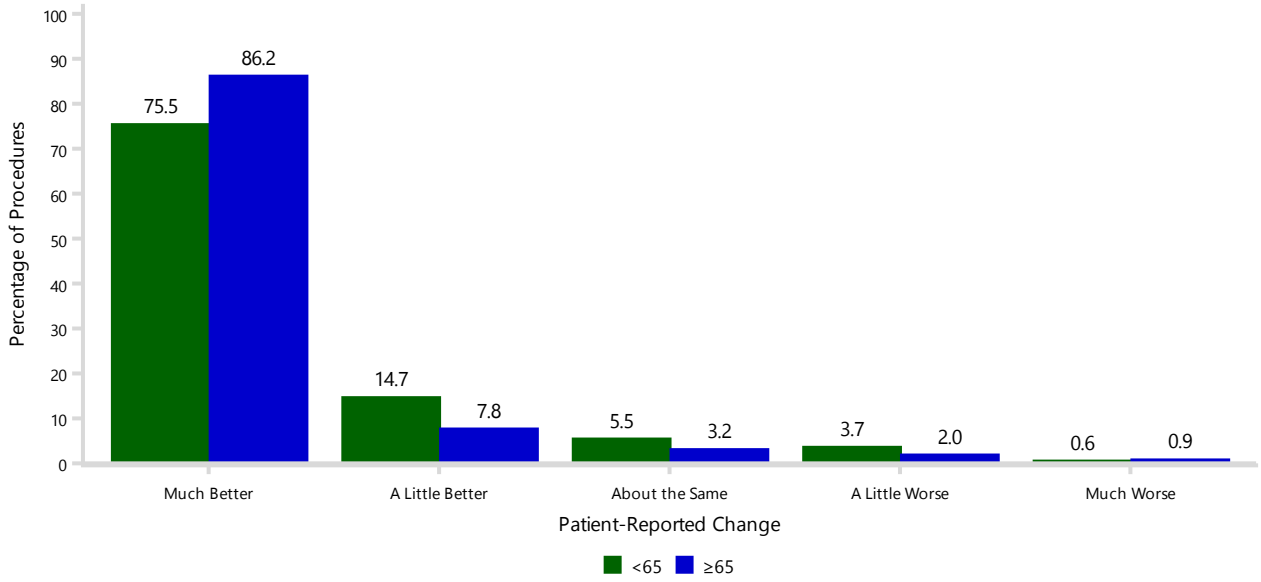
Note: Restricted to modern prostheses

Table SPR60 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)

	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
Age	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
<65	123	75.5	13.5	24	14.7	25.3	9	5.5	23.7	6	3.7	25.0	1	0.6	11.1	163	100.0	15.1
≥65	790	86.2	86.5	71	7.8	74.7	29	3.2	76.3	18	2.0	75.0	8	0.9	88.9	916	100.0	84.9
TOTAL	**913**	**84.6**	**100.0**	**95**	**8.8**	**100.0**	**38**	**3.5**	**100.0**	**24**	**2.2**	**100.0**	**9**	**0.8**	**100.0**	**1079**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR63 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis OA)



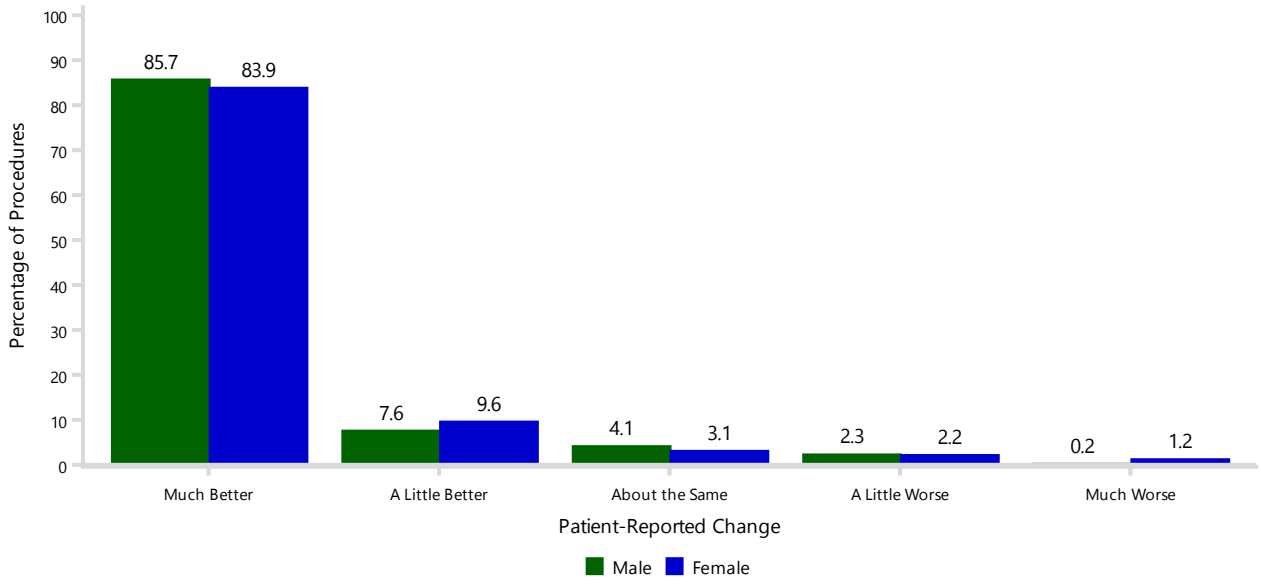
Note: Restricted to modern prostheses

Table SPR61 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Male	372	85.7	40.7	33	7.6	34.7	18	4.1	47.4	10	2.3	41.7	1	0.2	11.1	434	100.0	40.2
Female	541	83.9	59.3	62	9.6	65.3	20	3.1	52.6	14	2.2	58.3	8	1.2	88.9	645	100.0	59.8
TOTAL	**913**	**84.6**	**100.0**	**95**	**8.8**	**100.0**	**38**	**3.5**	**100.0**	**24**	**2.2**	**100.0**	**9**	**0.8**	**100.0**	**1079**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR64 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis OA)



Note: Restricted to modern prostheses

PRIMARY TOTAL STEMMED REVERSE SHOULDER REPLACEMENT FOR ROTATOR CUFF ARTHROPATHY

PATIENT CHARACTERISTICS

EQ-VAS and EQ-5D-5L

The mean EQ-VAS score increased by just over 6 points following reverse shoulder replacement for rotator cuff arthropathy (Table SPR62). Scores before and 6 months after surgery are shown in Figure SPR65. The percentage of patients who reported being better, worse, or no different post-operatively compared to their pre-operative response for each of the EQ-5D domains and the EQ-VAS is shown in Figure SPR66.

The EQ-VAS score for gender is shown in Table SPR63 and Figure SPR67 and for age in Table SPR64 and Figure SPR68.

Pre-operative mean EQ-VAS decreases with increasing ASA score. The mean change in score was similar for ASA 2 and 3 (Table SPR65 and Figure SPR69).

The mean EQ-VAS assessment before surgery is lower in obese class 1, 2 and 3 patients compared to pre-obese. Obese class 2 patients have the smallest change following surgery, and class 3 the largest improvement (Table SPR66 and Figure SPR70).

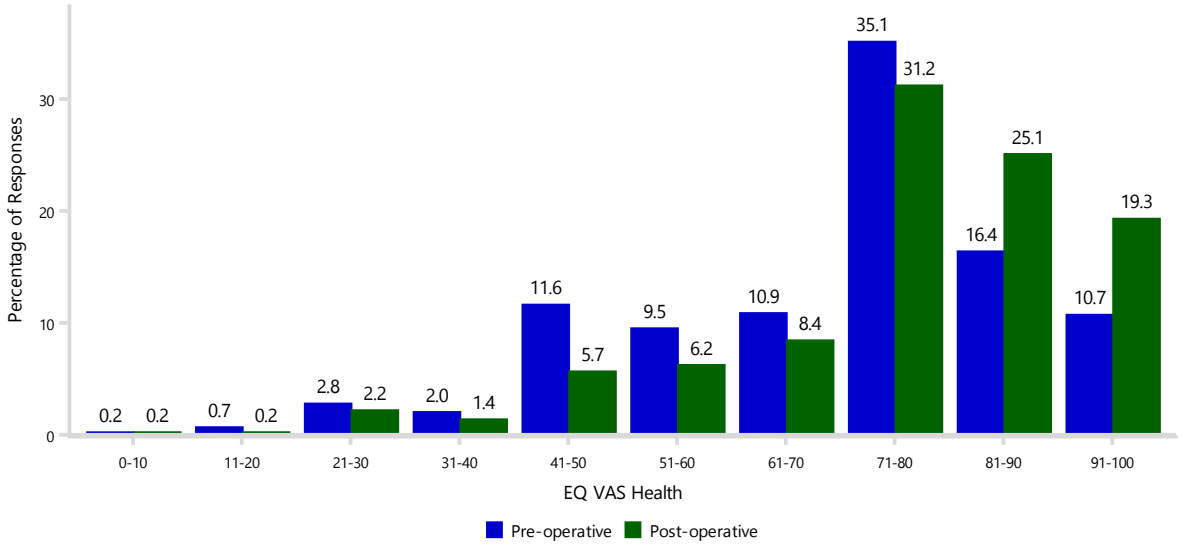
Glenoid morphology does not impact on pre- or post-operative EQ-VAS (Table SPR67 and Figure SPR71).

Table SPR62 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Stemmed Reverse	1324	70.64±17.80	75.00 (59.50, 83.00)	865	76.68±16.95	78.00 (71.00, 90.00)

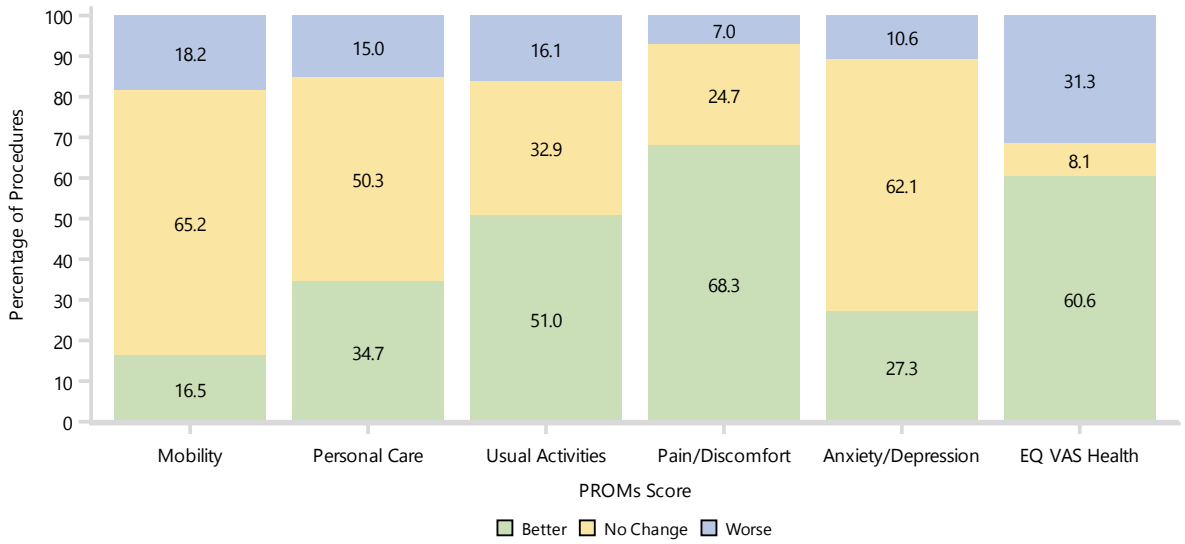
Note: Restricted to modern prostheses

Figure SPR65 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)



Note: Restricted to modern prostheses

Figure SPR66 Change in EQ-5D-5L Domain Score and EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)



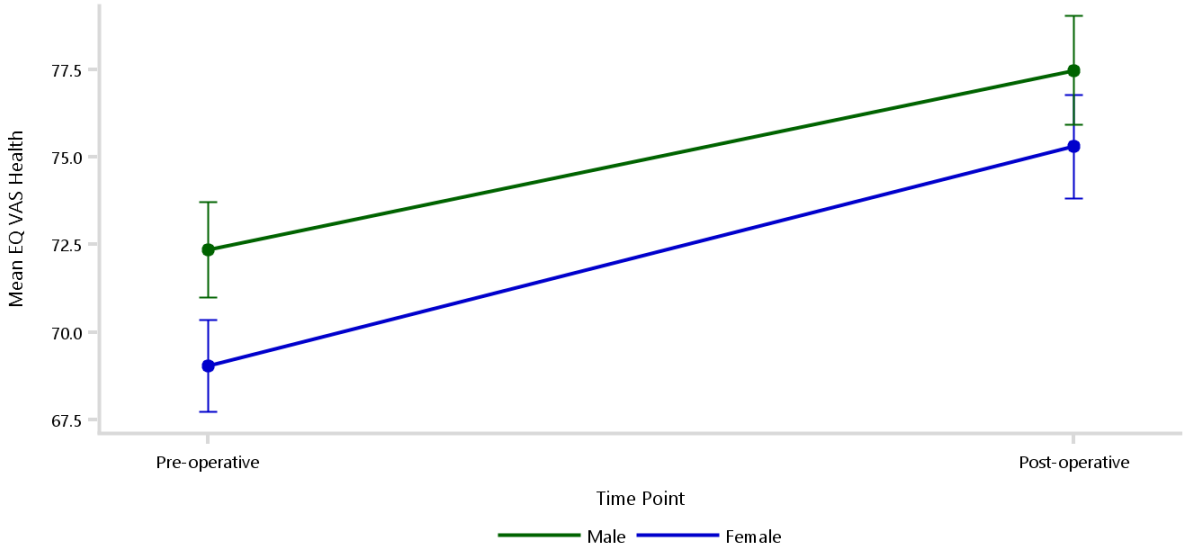
Note: Restricted to modern prostheses

Table SPR63 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)

Gender	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	631	72.36 (70.99, 73.73)	408	77.48 (75.93, 79.03)	5.12 (3.50, 6.74)
Female	693	69.04 (67.74, 70.35)	457	75.30 (73.83, 76.78)	6.26 (4.73, 7.79)

Note: Restricted to modern prostheses
Adjusted for age

Figure SPR67 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)



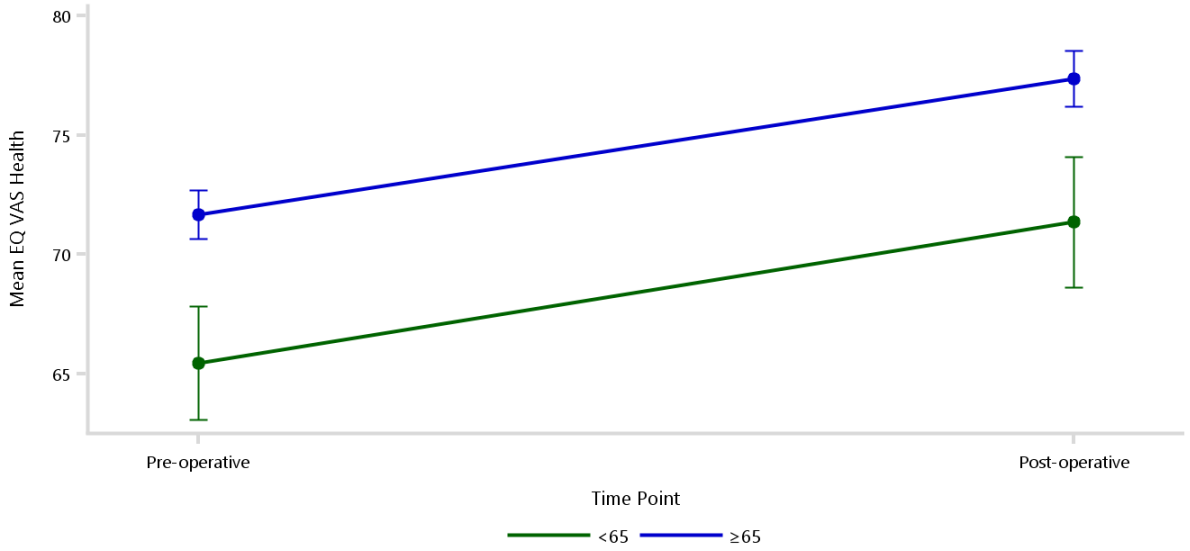
Note: Restricted to modern prostheses
Adjusted for age

Table SPR64 Mean Pre-operative and Post-operative EQ VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)

Age	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<65	207	65.43 (63.06, 67.80)	132	71.35 (68.62, 74.07)	5.92 (3.07, 8.77)
≥65	1117	71.67 (70.65, 72.70)	733	77.35 (76.20, 78.51)	5.68 (4.47, 6.89)

Note: Restricted to modern prostheses
Adjusted for gender

Figure SPR68 Mean Pre-operative and Post-operative EQ VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)



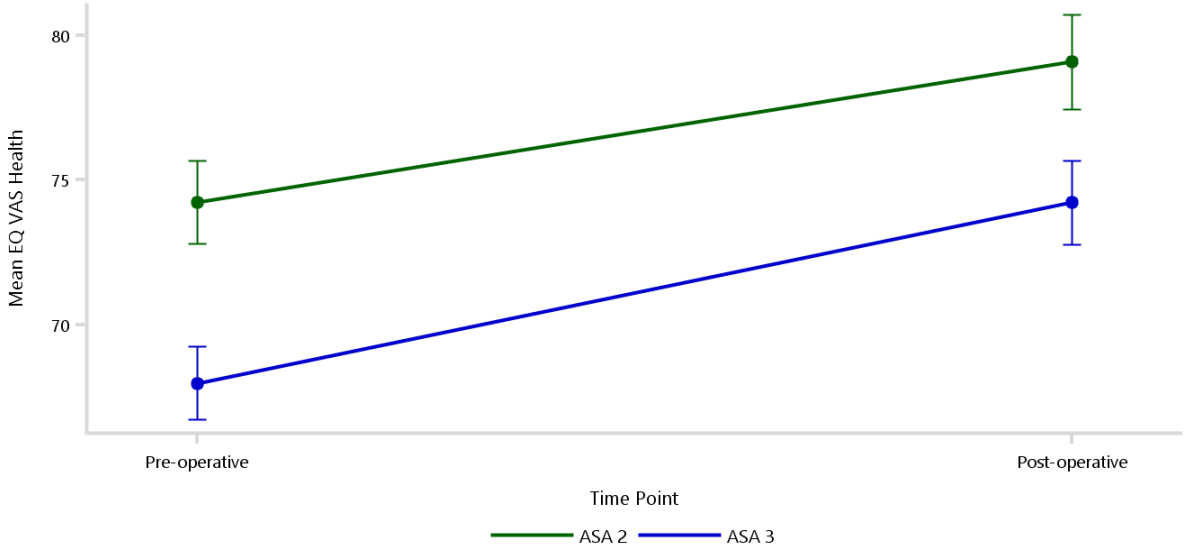
Note: Restricted to modern prostheses
Adjusted for gender

Table SPR65 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis Rotator Cuff Arthropathy)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 2	553	74.23 (72.80, 75.66)	361	79.09 (77.46, 80.73)	4.87 (3.18, 6.55)
ASA 3	702	67.97 (66.70, 69.23)	457	74.22 (72.77, 75.67)	6.25 (4.75, 7.76)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Figure SPR69 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis Rotator Cuff Arthropathy)



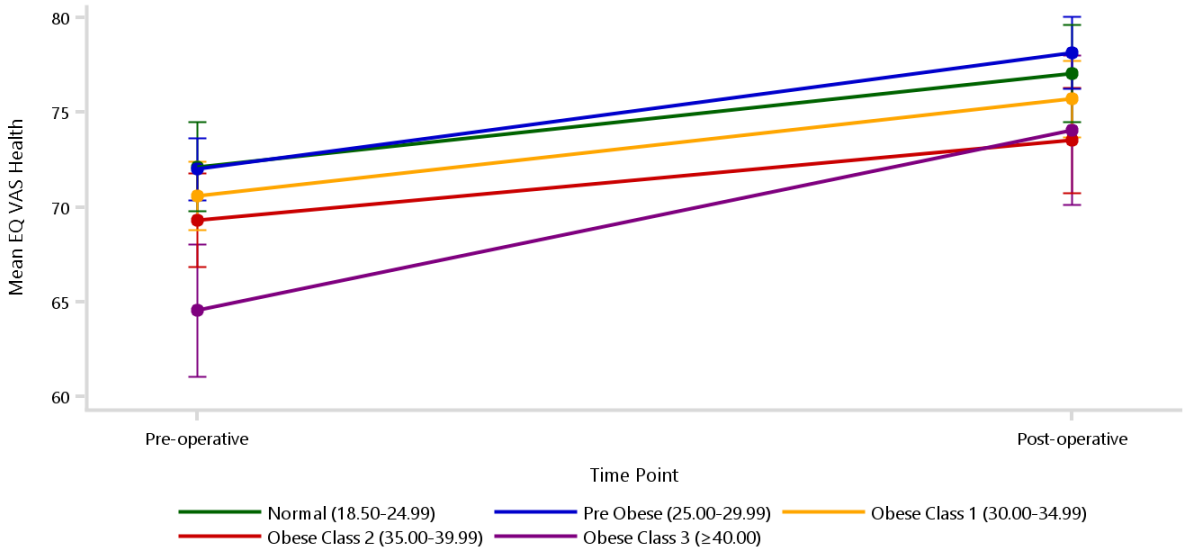
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Table SPR66 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis Rotator Cuff Arthropathy)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Normal (18.50-24.99)	213	72.15 (69.80, 74.49)	150	77.08 (74.51, 79.65)	4.93 (2.24, 7.63)
Pre Obese (25.00-29.99)	441	72.02 (70.39, 73.66)	273	78.17 (76.28, 80.06)	6.14 (4.17, 8.12)
Obese Class 1 (30.00-34.99)	358	70.60 (68.80, 72.41)	242	75.72 (73.70, 77.73)	5.11 (3.00, 7.22)
Obese Class 2 (35.00-39.99)	195	69.31 (66.84, 71.78)	128	73.55 (70.77, 76.33)	4.23 (1.37, 7.09)
Obese Class 3 (≥40.00)	98	64.56 (61.06, 68.06)	65	74.09 (70.15, 78.02)	9.53 (5.48, 13.59)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Figure SPR70 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis Rotator Cuff Arthropathy)



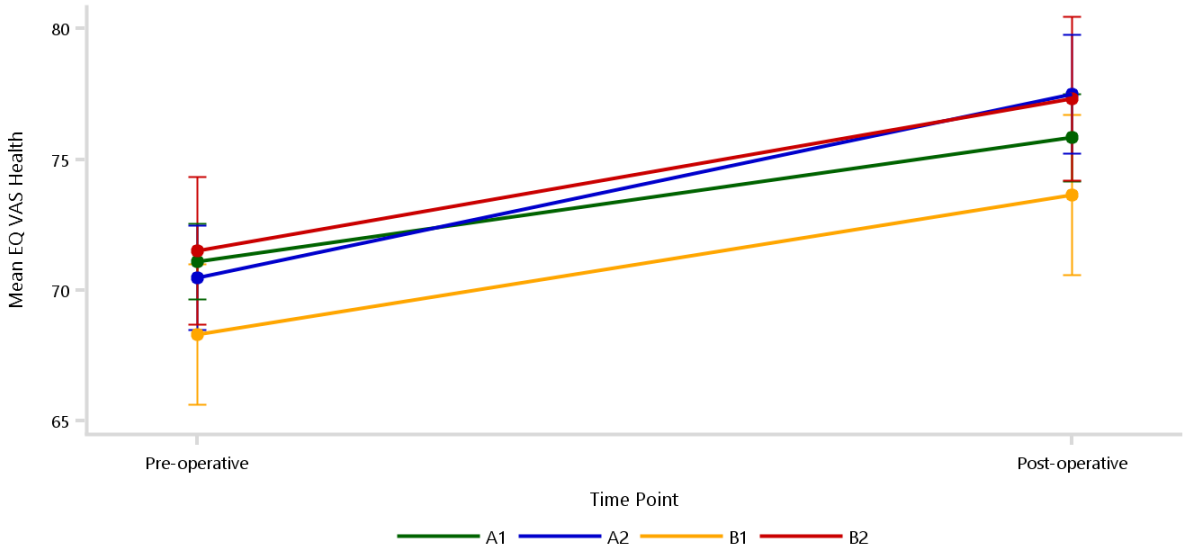
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Table SPR67 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis Rotator Cuff Arthropathy)

Glenoid Morphology	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
A1	557	71.10 (69.64, 72.56)	366	75.84 (74.17, 77.51)	4.74 (3.03, 6.46)
A2	296	70.49 (68.49, 72.48)	195	77.50 (75.22, 79.78)	7.01 (4.63, 9.39)
B1	165	68.31 (65.63, 70.98)	108	73.65 (70.59, 76.71)	5.34 (2.17, 8.52)
B2	149	71.50 (68.69, 74.32)	105	77.33 (74.21, 80.46)	5.83 (2.61, 9.05)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Figure SPR71 Mean Pre-operative and Post-operative EQ-VAS Health in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis Rotator Cuff Arthropathy)



Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Oxford Score

The Oxford Shoulder Scores (OSS) before and after reverse shoulder replacement undertaken for rotator cuff arthropathy are provided in Table SPR68.

The mean pre-operative and post-operative OSS by gender is shown in Table SPR69 and Figure SPR72 and by age in Table SPR70 and Figure SPR73. Females have lower pre-operative scores and a larger improvement after surgery.

Compared to patients with an ASA 2 score, patients with an ASA score of 3 have a lower pre-operative score and a larger improvement post-operatively (Table SPR71 and Figure SPR74).

Pre-operative mean Oxford score is lower with increasing BMI category. Pre-obese and obese class 1 and 2 patients have similar changes in score post-operatively. Obese class 3 patients have the largest change post-operatively (Table SPR72 and Figure SPR75).

Glenoid morphology does not affect the preoperative OSS although currently there are too few procedures with glenoid morphology C for analysis. The post-operative improvement is similar for all glenoid morphologies (Table SPR73 and Figure SPR76).

Table SPR68 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)

Class	Pre-operative			Post-operative		
	N	Mean±SD	Median (Q1, Q3)	N	Mean±SD	Median (Q1, Q3)
Total Stemmed Reverse	1319	23.68±8.98	24.00 (17.00, 30.00)	862	37.43±8.76	39.00 (33.00, 44.00)

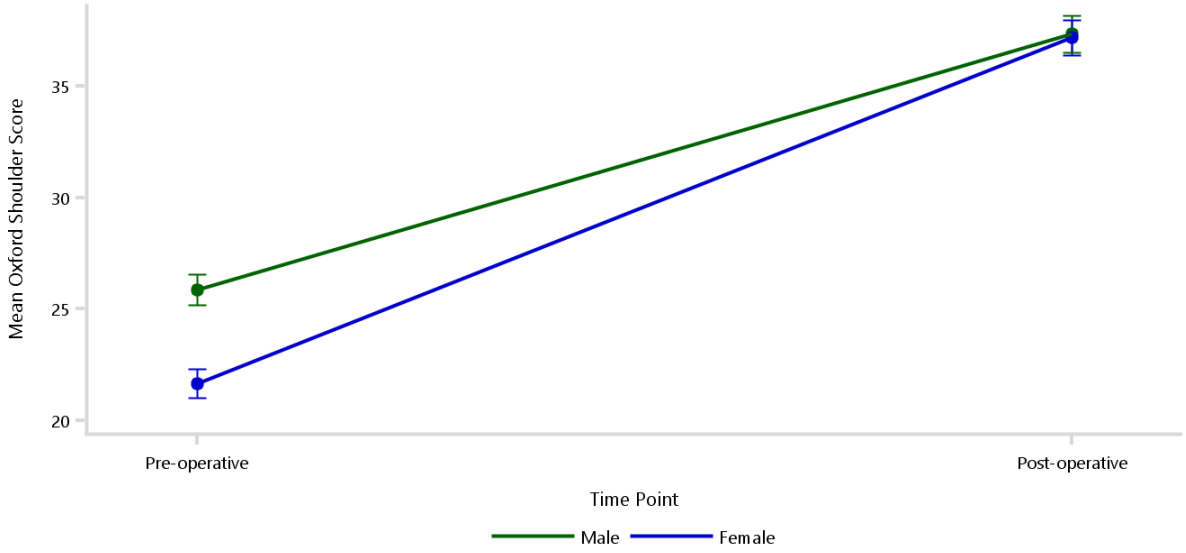
Note: Restricted to modern prostheses

Table SPR69 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)

Gender	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Male	627	25.86 (25.18, 26.55)	407	37.32 (36.49, 38.14)	11.45 (10.54, 12.36)
Female	692	21.67 (21.01, 22.32)	455	37.16 (36.38, 37.94)	15.49 (14.63, 16.35)

Note: Restricted to modern prostheses
Adjusted for age

Figure SPR72 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)



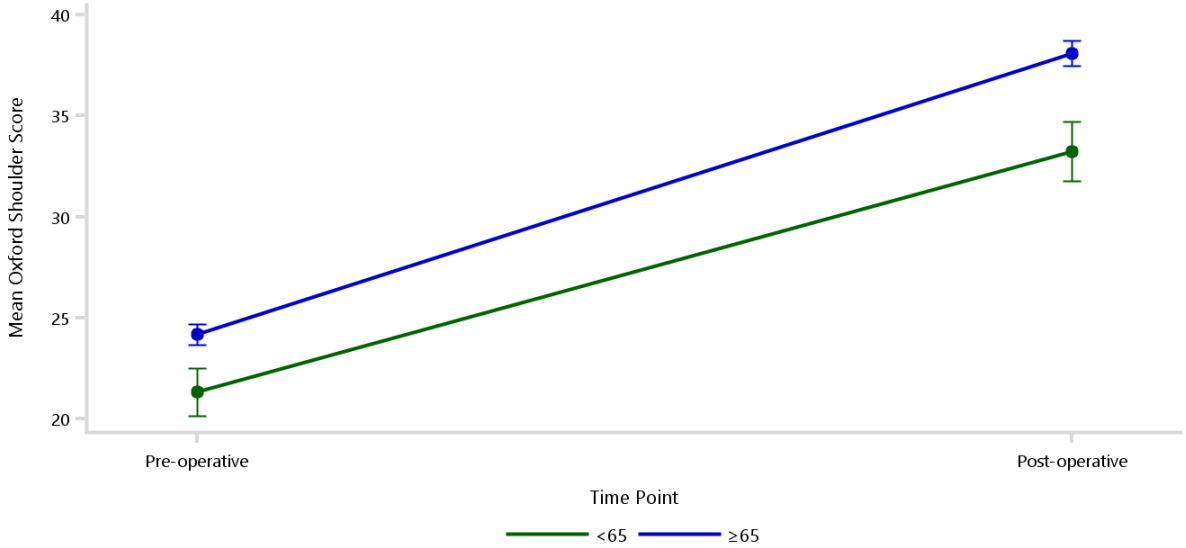
Note: Restricted to modern prostheses
Adjusted for age

Table SPR70 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)

Age	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
<65	207	21.34 (20.15, 22.52)	130	33.22 (31.75, 34.68)	11.88 (10.25, 13.51)
≥65	1112	24.18 (23.66, 24.69)	732	38.07 (37.45, 38.69)	13.89 (13.20, 14.58)

Note: Restricted to modern prostheses
Adjusted for gender

Figure SPR73 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)



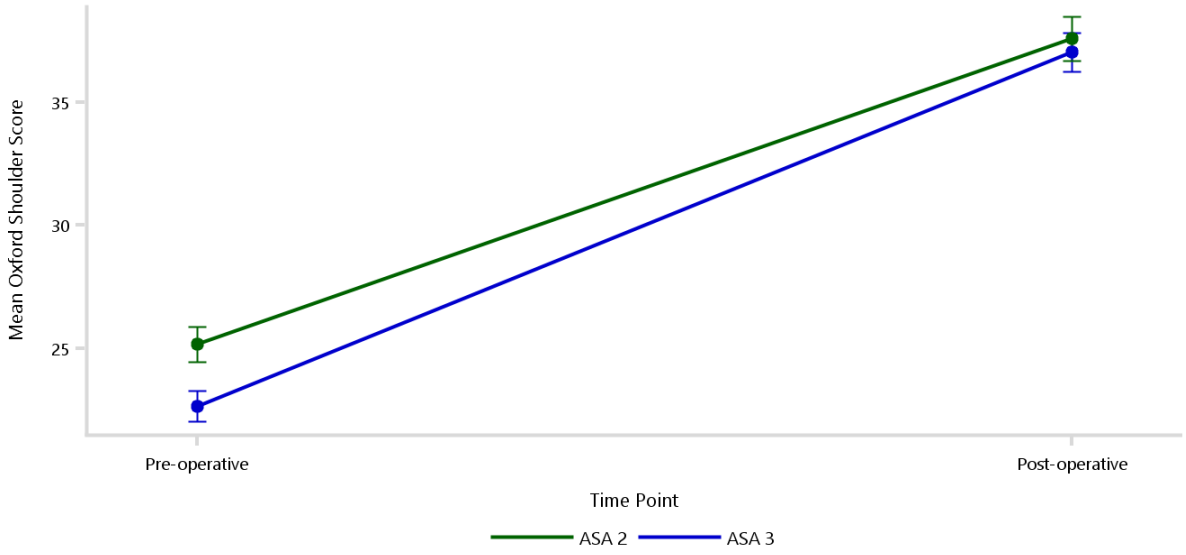
Note: Restricted to modern prostheses
Adjusted for gender

Table SPR71 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis Rotator Cuff Arthropathy)

ASA Score	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
ASA 2	553	25.16 (24.45, 25.88)	359	37.61 (36.72, 38.50)	12.45 (11.47, 13.42)
ASA 3	696	22.64 (22.01, 23.28)	456	37.06 (36.27, 37.85)	14.42 (13.55, 15.29)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Figure SPR74 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by ASA Score (Primary Diagnosis Rotator Cuff Arthropathy)



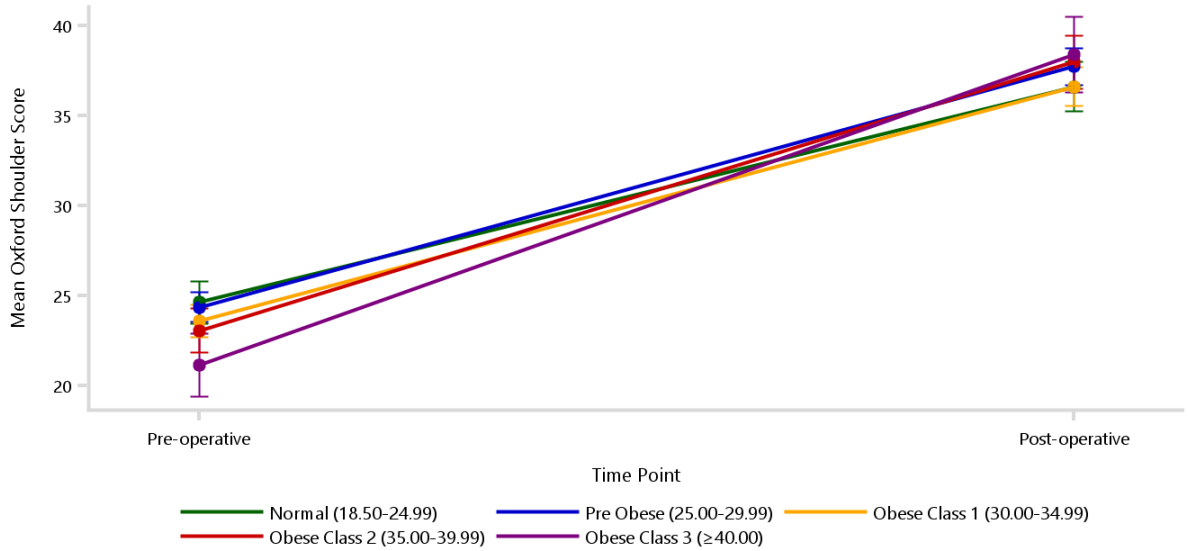
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

Table SPR72 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis Rotator Cuff Arthropathy)

BMI Category	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
Normal (18.50-24.99)	212	24.62 (23.44, 25.79)	152	36.61 (35.25, 37.98)	12.00 (10.48, 13.52)
Pre Obese (25.00-29.99)	437	24.35 (23.53, 25.17)	270	37.74 (36.72, 38.76)	13.39 (12.27, 14.52)
Obese Class 1 (30.00-34.99)	361	23.56 (22.66, 24.46)	239	36.61 (35.53, 37.70)	13.05 (11.85, 14.25)
Obese Class 2 (35.00-39.99)	192	23.05 (21.81, 24.29)	128	37.98 (36.49, 39.47)	14.93 (13.29, 16.57)
Obese Class 3 (≥40.00)	98	21.11 (19.37, 22.86)	65	38.39 (36.28, 40.50)	17.28 (14.96, 19.59)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Figure SPR75 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by BMI Category (Primary Diagnosis Rotator Cuff Arthropathy)



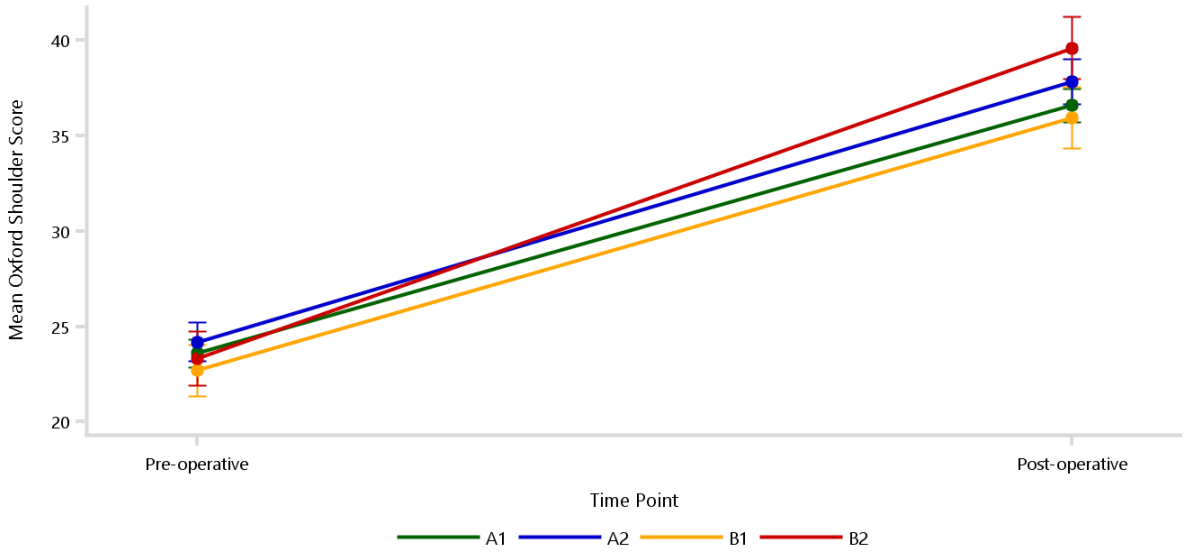
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

Table SPR73 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis Rotator Cuff Arthropathy)

Glenoid Morphology	Pre-operative		Post-operative		
	N	Mean (95% CI)	N	Mean (95% CI)	Change in Score
A1	555	23.58 (22.85, 24.32)	364	36.61 (35.73, 37.48)	13.02 (12.05, 14.00)
A2	295	24.19 (23.19, 25.19)	194	37.84 (36.64, 39.04)	13.65 (12.31, 14.99)
B1	164	22.69 (21.35, 24.04)	109	35.94 (34.34, 37.55)	13.25 (11.47, 15.03)
B2	148	23.32 (21.90, 24.74)	104	39.61 (37.96, 41.25)	16.29 (14.46, 18.11)

Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Figure SPR76 Mean Pre-operative and Post-operative Oxford Shoulder Score in Primary Total Stemmed Reverse Shoulder Replacement by Glenoid Morphology (Primary Diagnosis Rotator Cuff Arthropathy)



Note: Restricted to modern prostheses
Adjusted for age and gender
Only glenoid morphologies with >40 pre-operative and post-operative responses have been included

Patient Satisfaction and Change

Patients were surveyed at 6 months post-operatively on how satisfied they were with their primary total stemmed reverse shoulder replacement for rotator cuff arthropathy, and on their perceived change in their shoulder after surgery.

After this procedure, 85.4% of patients are very satisfied or satisfied (Table SPR74).

Procedure satisfaction by age and gender are presented in Table SPR75, Figure SPR77, Table SPR76 and Figure SPR78.

There was a high percentage (91.7%) of patients who rated their shoulder as much better and a little better (Table SPR77).

Patient-reported change by age and gender are presented in Table SPR78, Figure SPR79, Table SPR79, and Figure SPR80.

Table SPR74 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)

Class	Very Satisfied		Satisfied		Neutral		Dissatisfied		Very Dissatisfied		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Stemmed Reverse	495	57.6	239	27.8	82	9.5	29	3.4	15	1.7	860	100.0

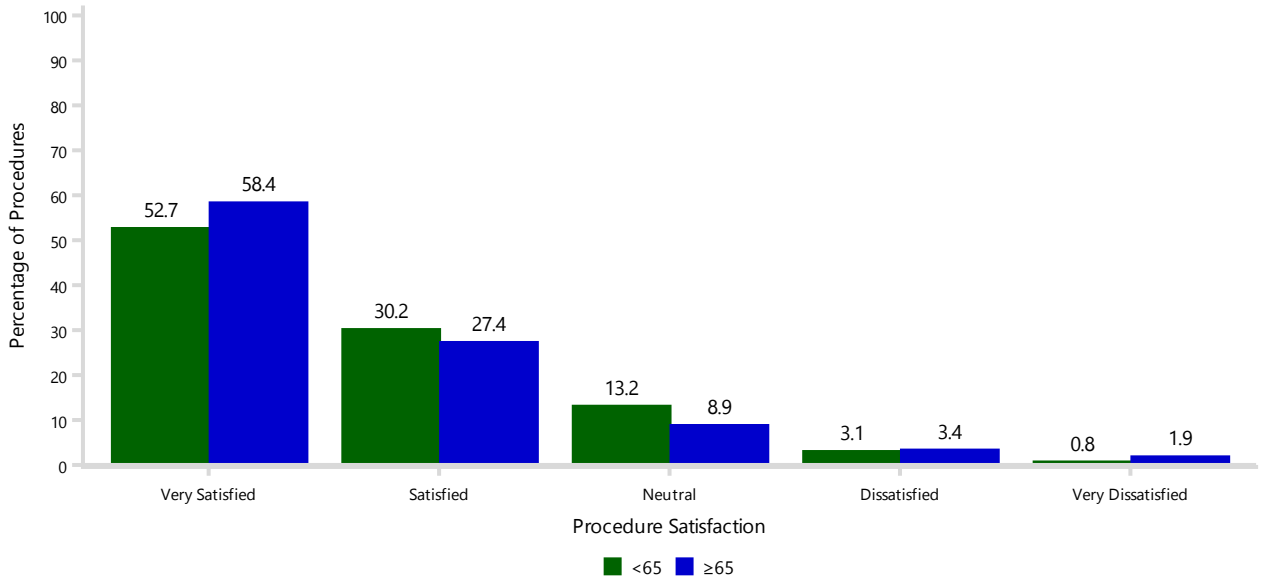
Note: Restricted to modern prostheses

Table SPR75 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)

Age	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
<65	68	52.7	13.7	39	30.2	16.3	17	13.2	20.7	4	3.1	13.8	1	0.8	6.7	129	100.0	15.0
≥65	427	58.4	86.3	200	27.4	83.7	65	8.9	79.3	25	3.4	86.2	14	1.9	93.3	731	100.0	85.0
TOTAL	**495**	**57.6**	**100.0**	**239**	**27.8**	**100.0**	**82**	**9.5**	**100.0**	**29**	**3.4**	**100.0**	**15**	**1.7**	**100.0**	**860**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR77 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)



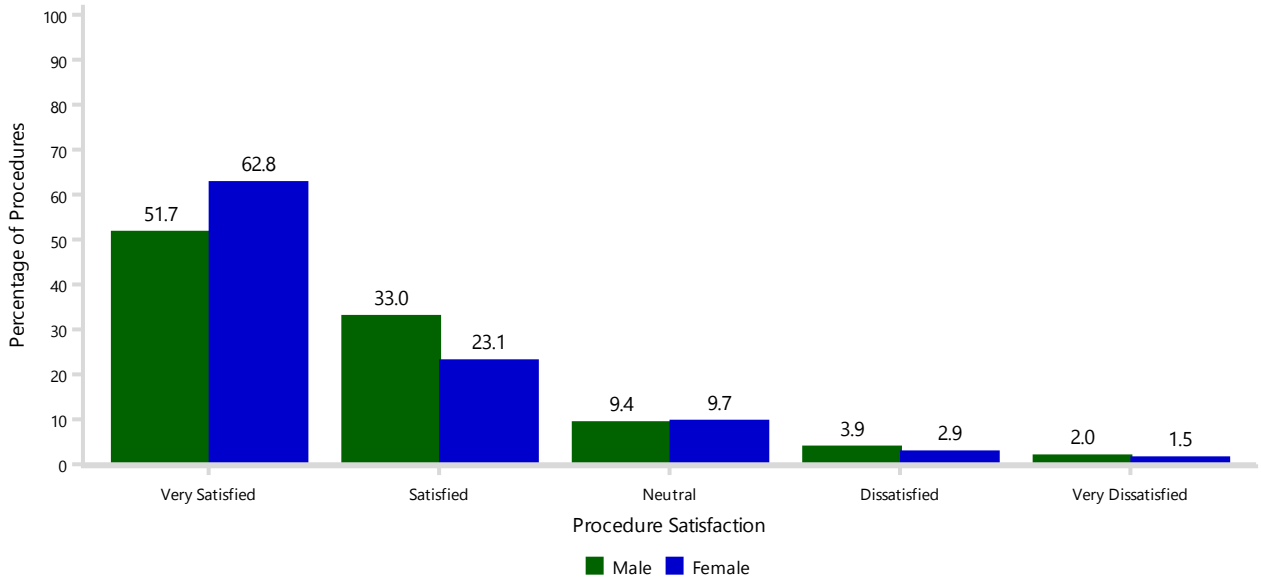
Note: Restricted to modern prostheses

Table SPR76 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)

Gender	Very Satisfied			Satisfied			Neutral			Dissatisfied			Very Dissatisfied			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Male	210	51.7	42.4	134	33.0	56.1	38	9.4	46.3	16	3.9	55.2	8	2.0	53.3	406	100.0	47.2
Female	285	62.8	57.6	105	23.1	43.9	44	9.7	53.7	13	2.9	44.8	7	1.5	46.7	454	100.0	52.8
TOTAL	**495**	**57.6**	**100.0**	**239**	**27.8**	**100.0**	**82**	**9.5**	**100.0**	**29**	**3.4**	**100.0**	**15**	**1.7**	**100.0**	**860**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR78 Procedure Satisfaction in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)



Note: Restricted to modern prostheses

Table SPR77 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement (Primary Diagnosis Rotator Cuff Arthropathy)

Class	Much Better		A Little Better		About the Same		A Little Worse		Much Worse		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Total Stemmed Reverse	680	79.1	108	12.6	42	4.9	24	2.8	6	0.7	860	100.0

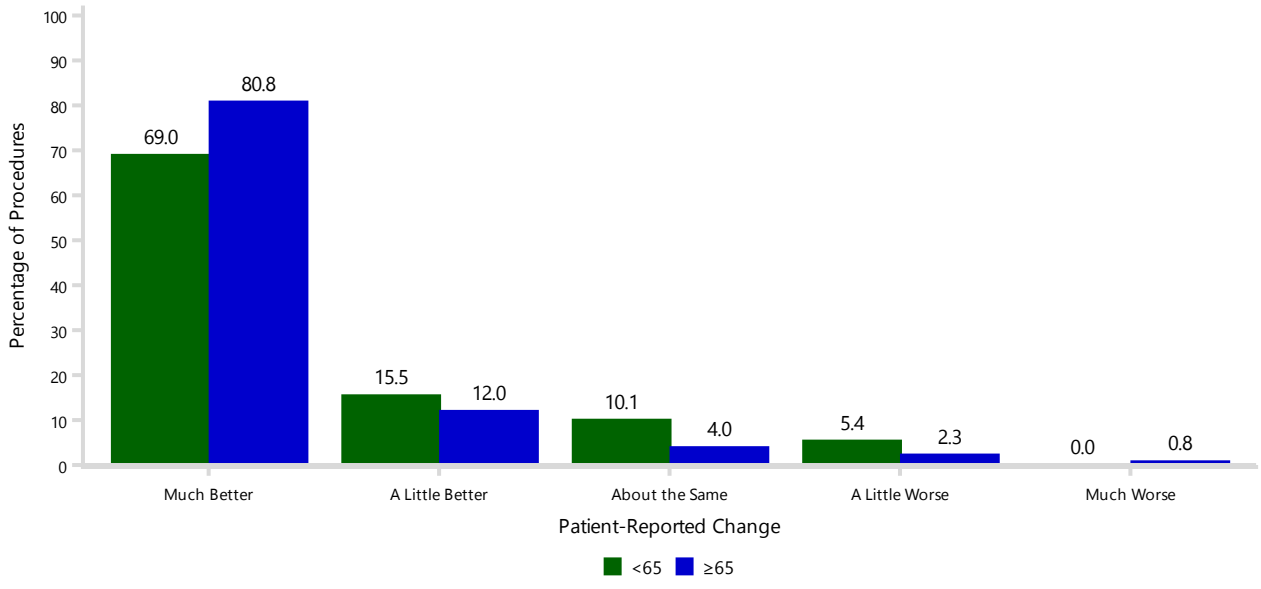
Note: Restricted to modern prostheses

Table SPR78 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)

Age	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
<65	89	69.0	13.1	20	15.5	18.5	13	10.1	31.0	7	5.4	29.2	.	.	.	129	100.0	15.0
≥65	591	80.8	86.9	88	12.0	81.5	29	4.0	69.0	17	2.3	70.8	6	0.8	100.0	731	100.0	85.0
TOTAL	**680**	**79.1**	**100.0**	**108**	**12.6**	**100.0**	**42**	**4.9**	**100.0**	**24**	**2.8**	**100.0**	**6**	**0.7**	**100.0**	**860**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR79 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Age (Primary Diagnosis Rotator Cuff Arthropathy)



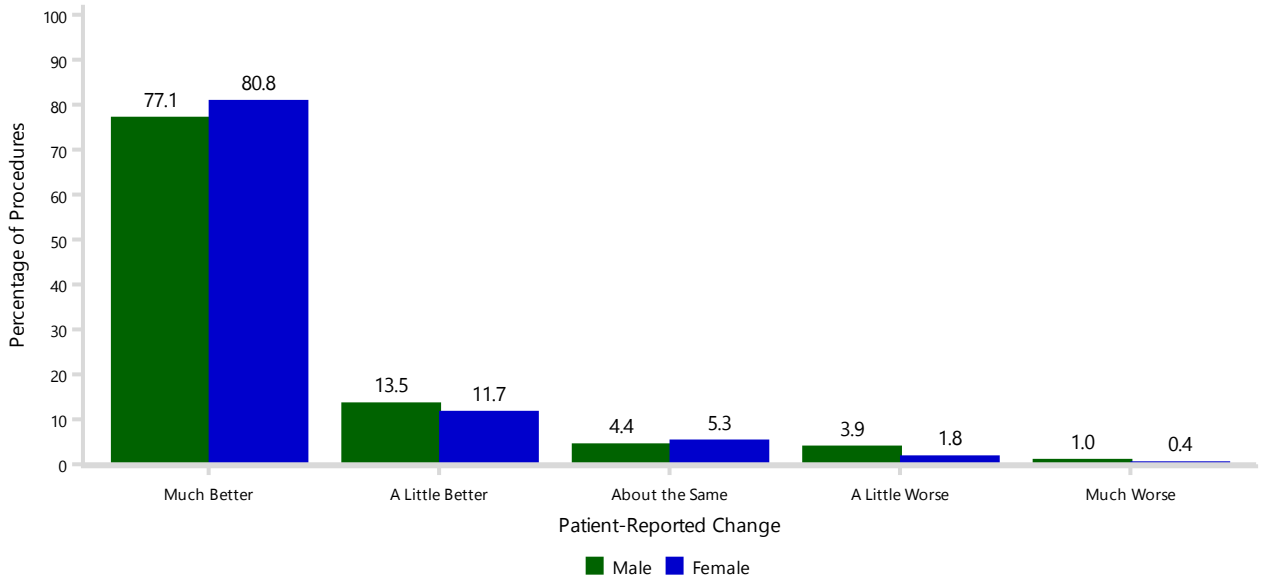
Note: Restricted to modern prostheses

Table SPR79 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)

Gender	Much Better			A Little Better			About the Same			A Little Worse			Much Worse			TOTAL		
	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%	N	Row%	Col%
Male	313	77.1	46.0	55	13.5	50.9	18	4.4	42.9	16	3.9	66.7	4	1.0	66.7	406	100.0	47.2
Female	367	80.8	54.0	53	11.7	49.1	24	5.3	57.1	8	1.8	33.3	2	0.4	33.3	454	100.0	52.8
TOTAL	**680**	**79.1**	**100.0**	**108**	**12.6**	**100.0**	**42**	**4.9**	**100.0**	**24**	**2.8**	**100.0**	**6**	**0.7**	**100.0**	**860**	**100.0**	**100.0**

Note: Restricted to modern prostheses

Figure SPR80 Patient-Reported Change in Primary Total Stemmed Reverse Shoulder Replacement by Gender (Primary Diagnosis Rotator Cuff Arthropathy)



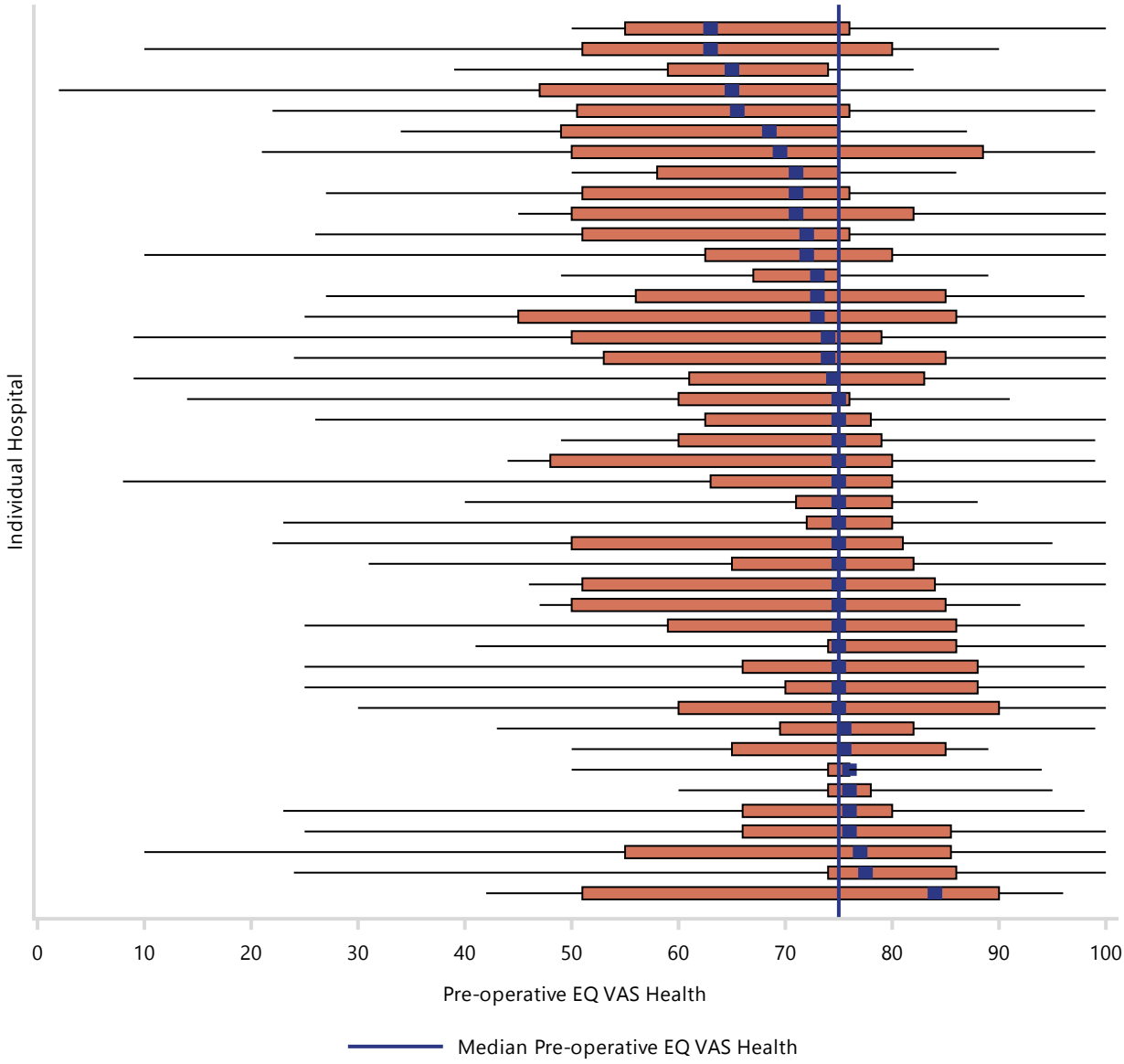
Note: Restricted to modern prostheses

HOSPITAL PROMS

EQ-VAS

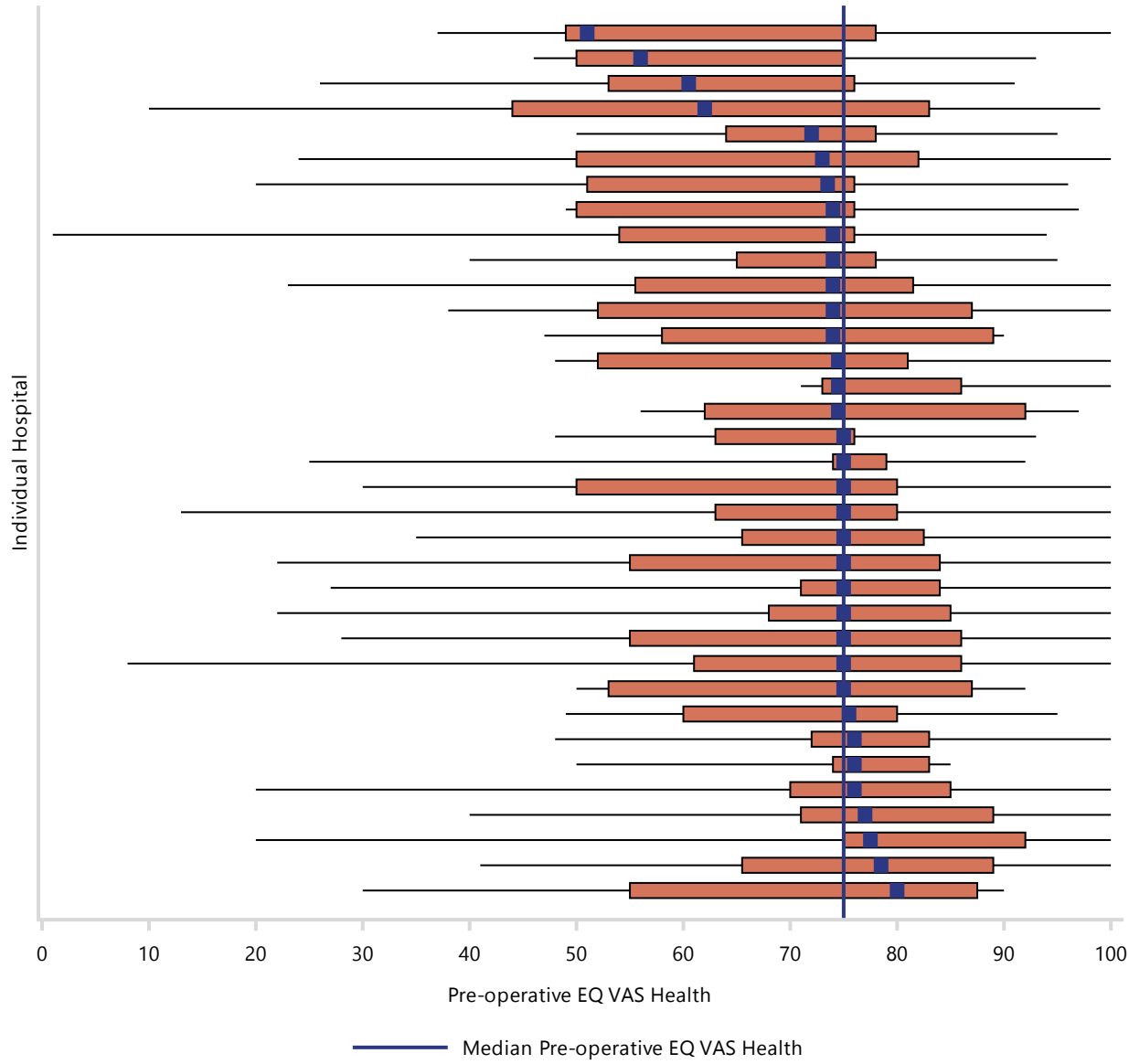
EQ-VAS Variation between hospitals in the EQ-VAS is displayed as 'caterpillar plots' for hospitals with at least 10 recorded cases for total stemmed reverse shoulder replacement for procedures with a primary diagnosis of osteoarthritis are shown in Figure SPR81 and for a primary diagnosis of rotator cuff arthropathy are shown in Figure SPR82. These analyses show pre-operative quality of life assessments for patients of individual hospitals compared to the median value represented by the vertical blue line. The median for each hospital is shown as a blue square, the interquartile range is coloured orange, while the entire range is shown by the grey bars. Most hospitals have an interquartile range that includes the group median value.

Figure SPR81 Pre-Operative EQ-VAS Health in Total Stemmed Reverse Shoulder by Hospital (Primary Diagnosis OA)



Note: The median Pre-operative EQ VAS Health is 75
Only hospitals with at least 10 procedures have been shown
Restricted to modern prostheses

Figure SPR82 Pre-Operative EQ-VAS Health in Total Stemmed Reverse Shoulder by Hospital (Primary Diagnosis Rotator Cuff Arthropathy)

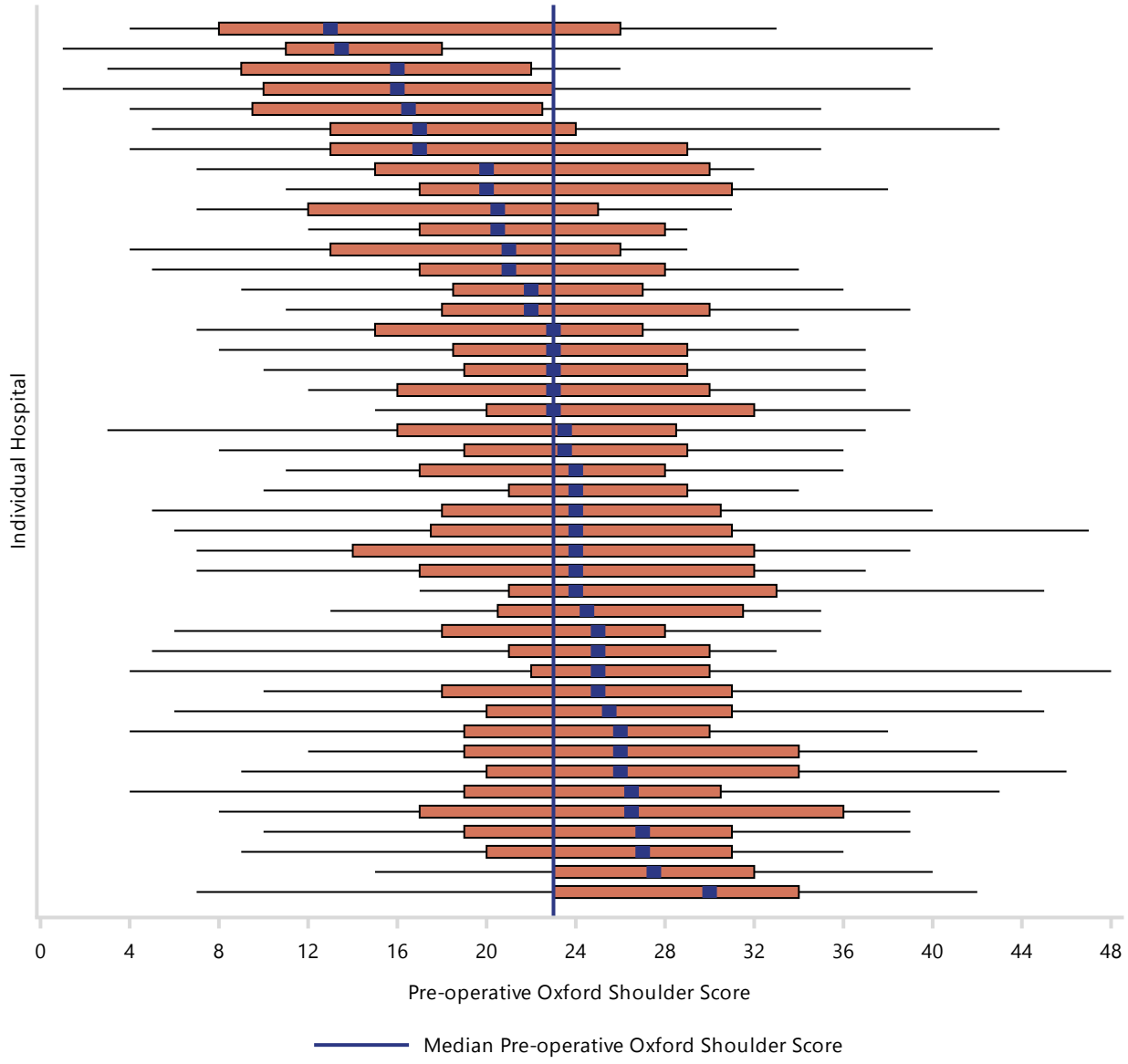


Note: The median Pre-operative EQ VAS Health is 75
Only hospitals with at least 10 procedures have been shown
Restricted to modern prostheses

Oxford Score

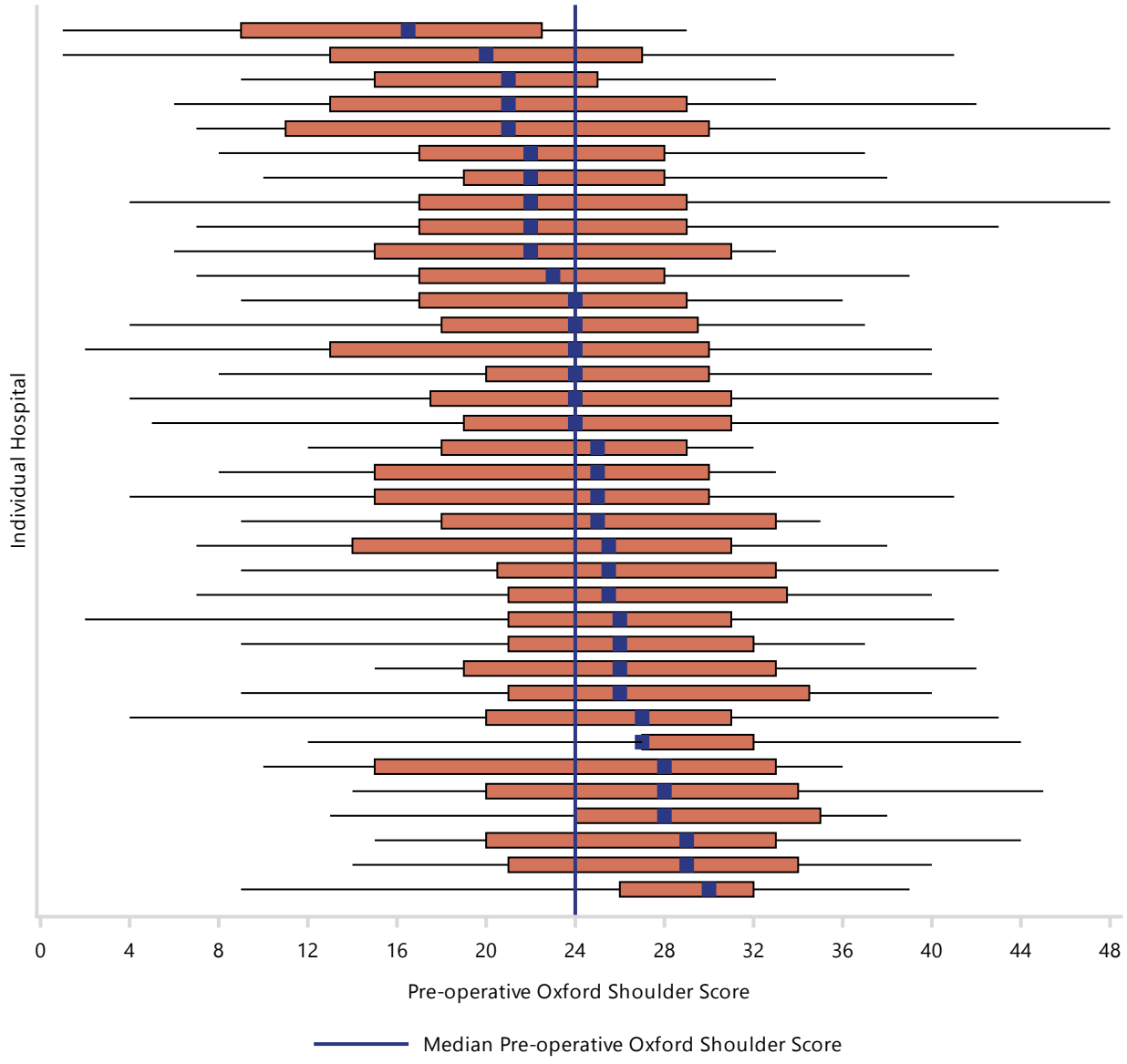
Comparisons of pre-operative Oxford Scores between hospitals for primary stemmed reverse shoulder replacement for procedures with a primary diagnosis of osteoarthritis are shown in Figure SPR83 and for a primary diagnosis of rotator cuff arthropathy are shown in Figure SPR84. These analyses show pre-operative quality of life assessments for patients of individual hospitals compared to the median value represented by the vertical blue line. The median for each hospital is shown as a blue square, the interquartile range is coloured orange, while the entire range is shown by the grey bars. Most hospitals have an interquartile range that includes the group median value.

Figure SPR83 Pre-Operative Oxford Shoulder Score in Total Stemmed Reverse Shoulder by Hospital (Primary Diagnosis OA)



Note: The median Pre-operative Oxford Shoulder Score is 23
Only hospitals with at least 10 procedures have been shown
Restricted to modern prostheses

Figure SPR84 Pre-Operative Oxford Shoulder Score in Total Stemmed Reverse Shoulder by Hospital (Primary Diagnosis Rotator Cuff Arthropathy)



Note: The median Pre-operative Oxford Shoulder Score is 24
Only hospitals with at least 10 procedures have been shown
Restricted to modern prostheses

TABLES

Figures

Australian Orthopaedic Association National Joint Replacement Registry

AOANJRR
SAHMRI Building
North Terrace, Adelaide SA 5000
T: +61 8 8128 4280

aoanjrr.sahmri.com
aoa.org.au

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