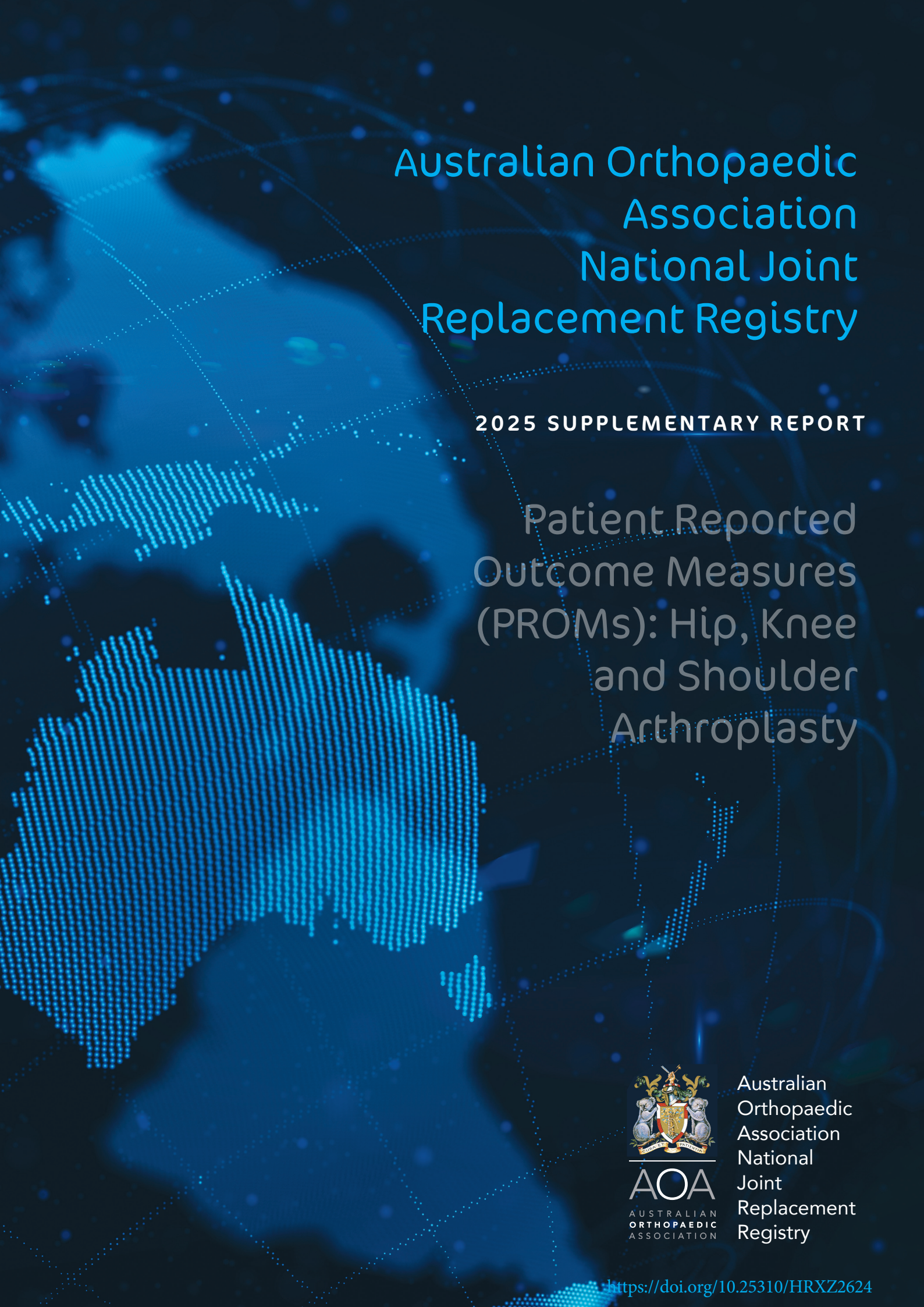
Australian Orthopaedic Association National Joint Replacement Registry

2025 SUPPLEMENTARY REPORT

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



Australian Orthopaedic Association National Joint Replacement Registry

https://doi.org/10.25310/HRXZ2624

Australian Orthopaedic Association National Joint Replacement Registry

Patient Reported Outcome Measures Hip, Knee and Shoulder Arthroplasty

2025 Supplementary Report

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

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

Executive Manager:
Sophie Corfield (Acting)
Kathy Hill
Roz Hanson (Feb – August 2025)
E: executivesupport@aoanjrr.org.au

The AOANJRR is funded by the Australian Government Department of Health, Disability and Ageing

Cite this report

Lewis PL, Gill DR, McAuliffe MJ, Stoney JD, Vertullo CJ, Wall CJ, Corfield S, Esaian R, Moylan S, Du P, Holder C, Edwards S, Xu Q, Oakey H, Lorimer MF, Smith PN. Patient Reported Outcome Measures: Hip, Knee and Shoulder Arthroplasty Supplementary Report in *Hip, Knee & Shoulder Arthroplasty: 2025 Annual Report*, Australian Orthopaedic Association National Joint Replacement Registry, AOA, Adelaide; 2025. https://doi.org/10.25310/HRXZ2624

Contents

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, 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 2025 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 2024 (described as modern prostheses) with a procedure date up to and including 31 December 2024. These include 40,847 pre-operative and 30,684 post-operative PROMs for primary total hip procedures performed for osteoarthritis, 65,814 pre-operative and 48,796 post-operative PROMs for primary total knee procedures for osteoarthritis and 2,568 pre-operative and 1,894 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 2025.

The 2025 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 2025 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 2025 Hip, Knee and Shoulder Arthroplasty Annual Report: https://aoanjrr.sahmri.com/annual-reports-2025.

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

PROMS INSTRUMENTS

The list of instruments used for AOANJRR PROMs collection is 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 details 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).

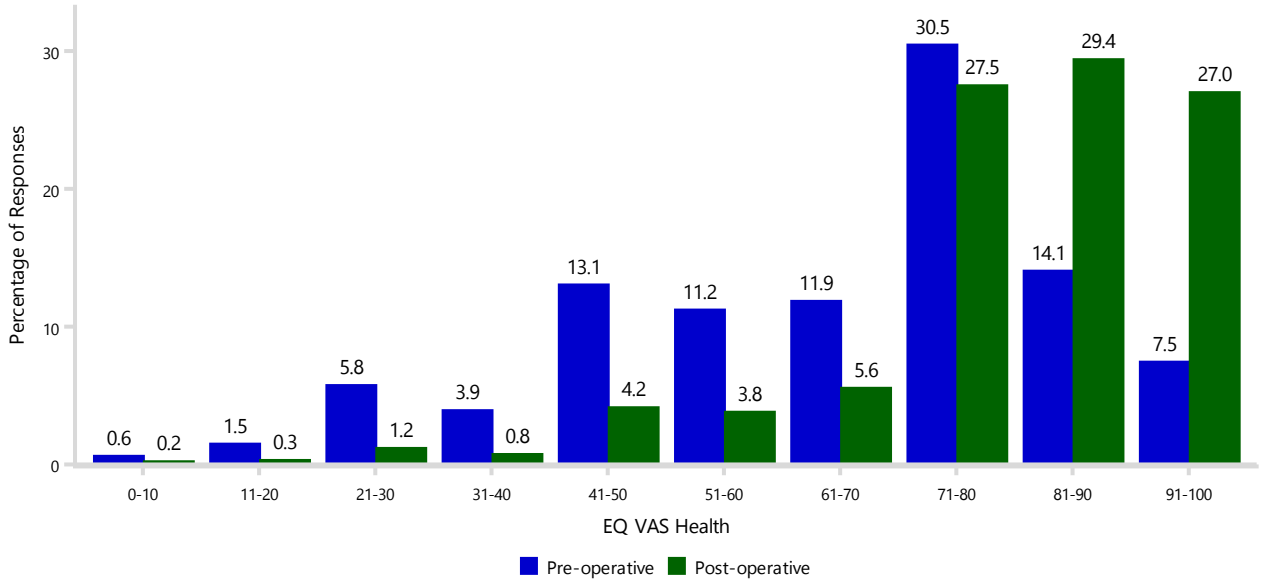
The mean pre-operative EQ-VAS assessment decreases with each increase in BMI category, apart from the underweight group where the number for assessment is small but post-operative improvements are similar (Table SPR5 and Figure SPR5).

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	40847	66.01(19.99)	72.00 (51.00, 80.00)	30684	80.92(15.65)	85.00 (75.00, 91.00)

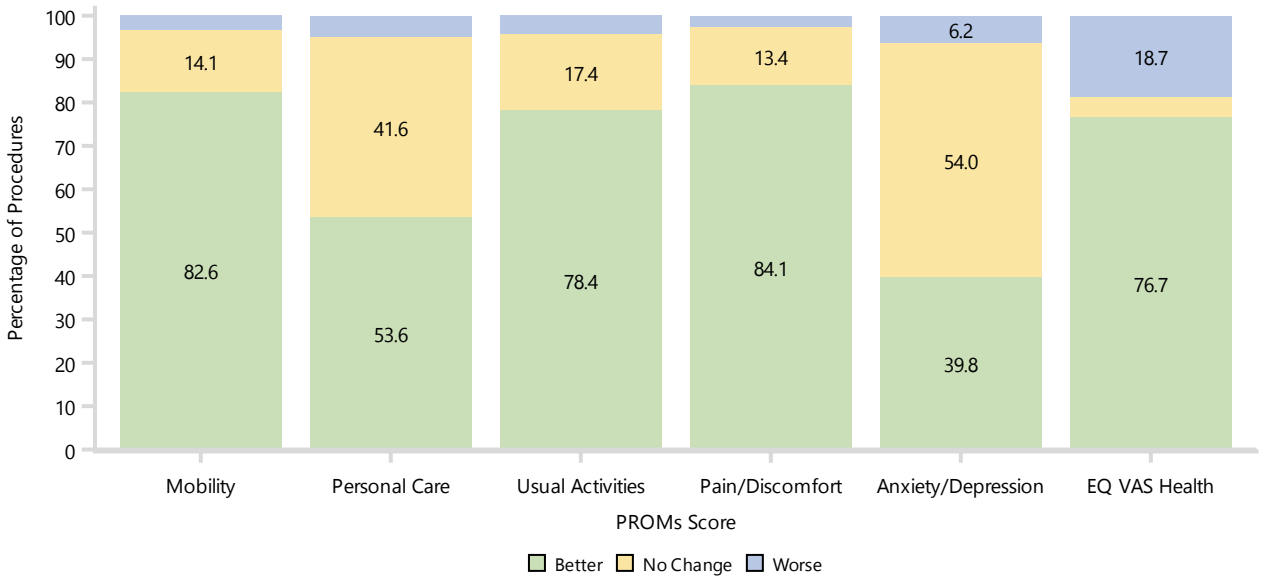
Note: Restricted to modern prostheses

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)



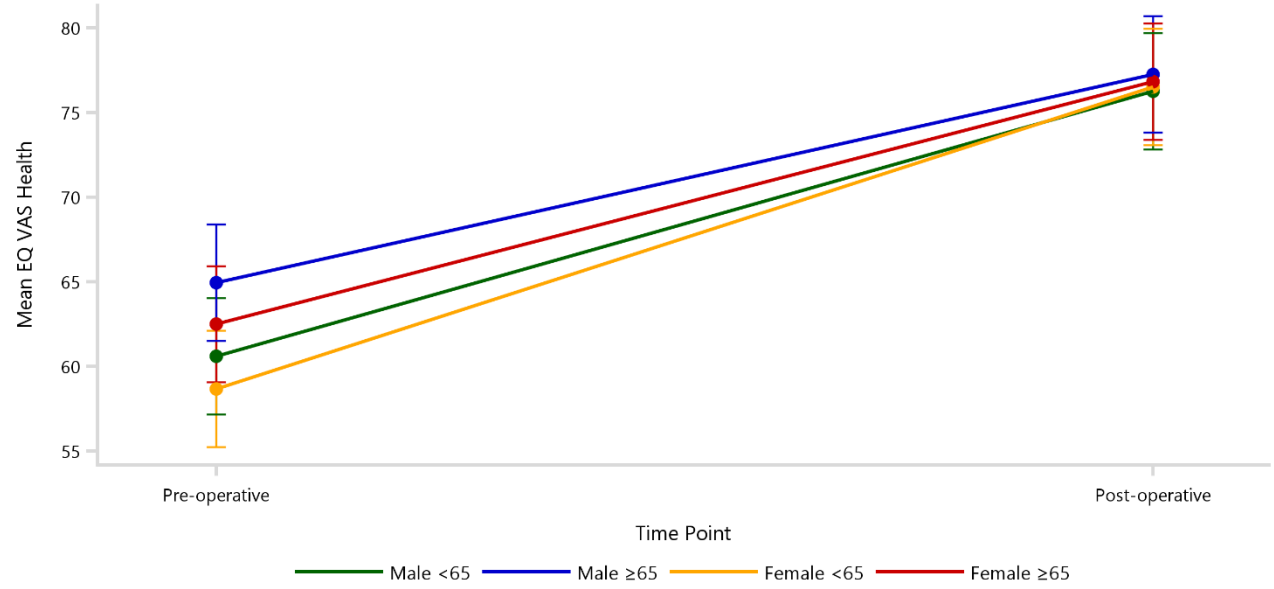
Note: Restricted to modern prostheses

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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
Male	<65	8102	60.62 (57.18, 64.06)	5917	76.26 (72.83, 79.70)	15.65 (15.15, 16.14)
Male	≥65	10537	64.95 (61.51, 68.38)	8044	77.26 (73.83, 80.69)	12.31 (11.88, 12.75)
Female	<65	7770	58.66 (55.22, 62.11)	5917	76.53 (73.09, 79.97)	17.87 (17.36, 18.37)
Female	≥65	14438	62.50 (59.07, 65.93)	10806	76.83 (73.40, 80.26)	14.33 (13.96, 14.70)

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)

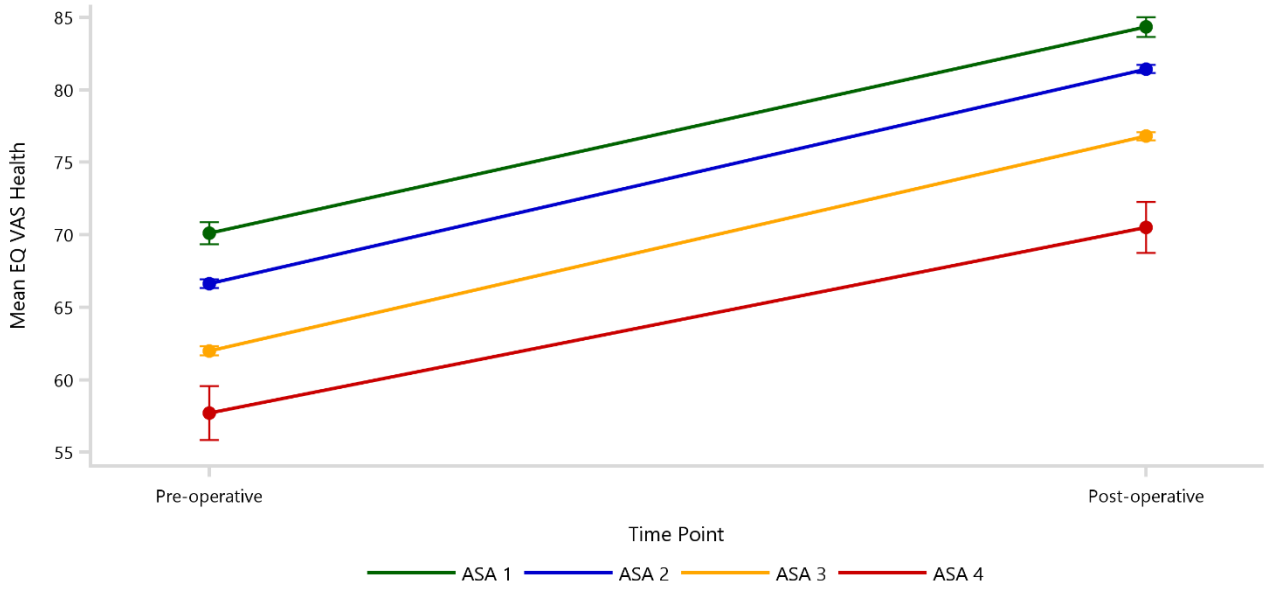
ASA Score	Pre-operative		Post-operative		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 1	2806	70.10 (69.35, 70.86)	2147	84.32 (83.64, 85.00)	14.21 (13.38, 15.05)
ASA 2	22118	66.61 (66.31, 66.91)	16909	81.43 (81.16, 81.70)	14.82 (14.52, 15.12)
ASA 3	15445	61.98 (61.67, 62.30)	11311	76.80 (76.51, 77.09)	14.81 (14.45, 15.18)
ASA 4	425	57.70 (55.84, 59.56)	286	70.51 (68.76, 72.27)	12.81 (10.56, 15.06)

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)

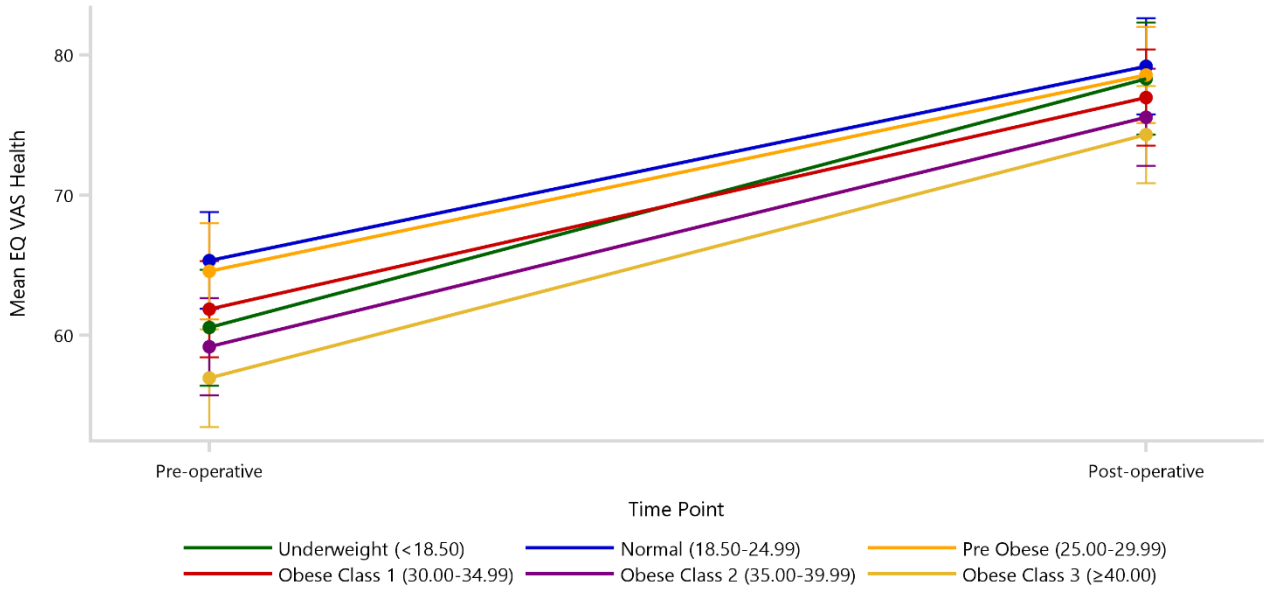
BMI Category	Pre-operative		Post-operative		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Underweight (<18.50)	268	60.55 (56.41, 64.68)	198	78.31 (74.30, 82.33)	17.76 (15.03, 20.49)
Normal (18.50-24.99)	8030	65.33 (61.89, 68.78)	6077	79.18 (75.74, 82.62)	13.85 (13.36, 14.35)
Pre Obese (25.00-29.99)	14546	64.56 (61.13, 67.99)	10960	78.58 (75.15, 82.01)	14.02 (13.65, 14.39)
Obese Class 1 (30.00-34.99)	10731	61.86 (58.42, 65.30)	8061	76.95 (73.52, 80.39)	15.10 (14.67, 15.53)
Obese Class 2 (35.00-39.99)	4700	59.17 (55.71, 62.64)	3494	75.55 (72.10, 79.01)	16.38 (15.73, 17.03)
Obese Class 3 (≥40.00)	2270	56.93 (53.44, 60.43)	1673	74.32 (70.84, 77.79)	17.38 (16.45, 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 21.00, and this improves to 41.42 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 the 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	40841	21.00(9.01)	21.00 (14.00, 27.00)	30714	41.42(7.21)	44.00 (39.00, 47.00)

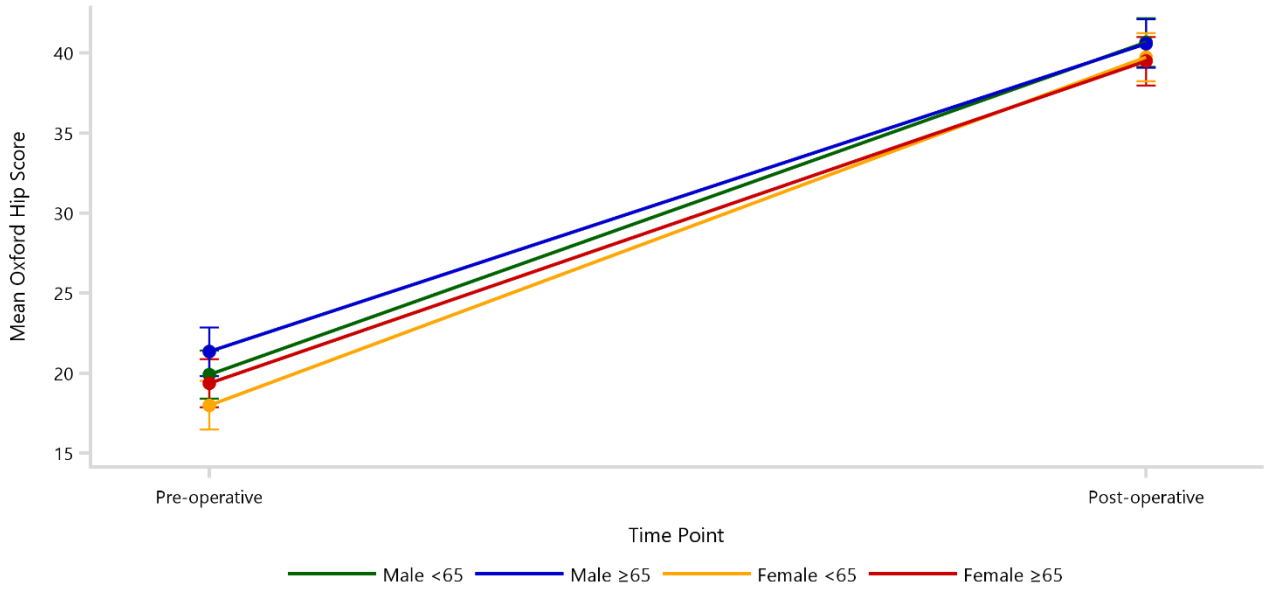
Note: Restricted to modern prostheses

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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
Male	<65	8100	19.91 (18.39, 21.42)	5915	40.66 (39.15, 42.17)	20.76 (20.52, 20.99)
Male	≥65	10525	21.34 (19.83, 22.85)	8071	40.59 (39.08, 42.10)	19.25 (19.05, 19.45)
Female	<65	7780	17.99 (16.48, 19.51)	5904	39.73 (38.22, 41.25)	21.74 (21.50, 21.98)
Female	≥65	14436	19.36 (17.86, 20.87)	10824	39.48 (37.98, 40.99)	20.12 (19.95, 20.30)

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)



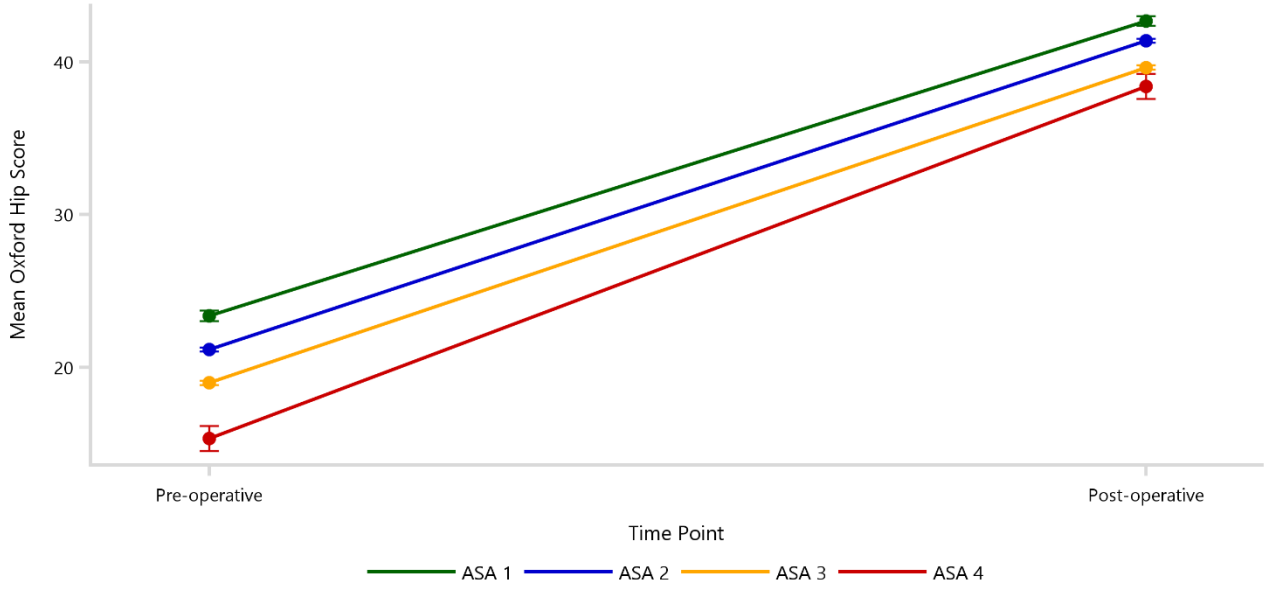
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 1	2814	23.37 (23.04, 23.70)	2152	42.67 (42.35, 42.98)	19.29 (18.90, 19.69)
ASA 2	22100	21.16 (21.03, 21.29)	16929	41.38 (41.25, 41.50)	20.22 (20.07, 20.36)
ASA 3	15452	18.99 (18.85, 19.13)	11316	39.62 (39.49, 39.76)	20.64 (20.47, 20.81)
ASA 4	423	15.34 (14.52, 16.17)	287	38.37 (37.56, 39.18)	23.03 (21.97, 24.09)

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)



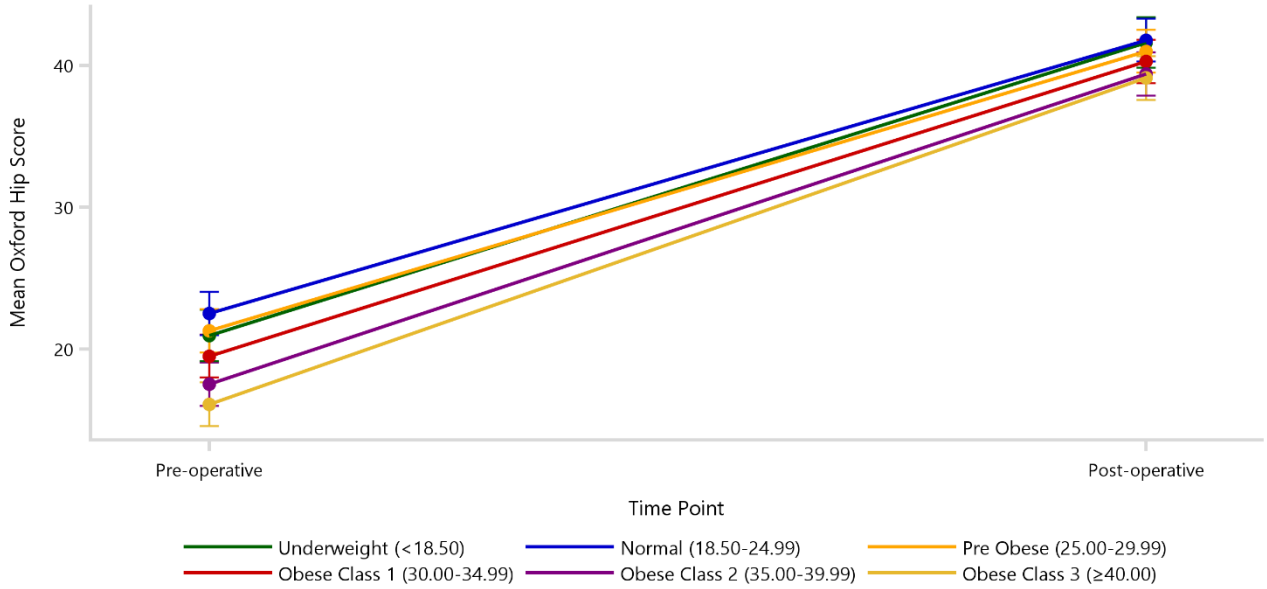
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Underweight (<18.50)	265	20.98 (19.15, 22.81)	200	41.61 (39.83, 43.40)	20.63 (19.35, 21.92)
Normal (18.50-24.99)	8016	22.52 (21.01, 24.04)	6103	41.78 (40.27, 43.30)	19.26 (19.03, 19.49)
Pre Obese (25.00-29.99)	14569	21.30 (19.79, 22.81)	10973	41.01 (39.50, 42.52)	19.71 (19.53, 19.88)
Obese Class 1 (30.00-34.99)	10720	19.52 (18.01, 21.03)	8056	40.28 (38.77, 41.79)	20.76 (20.56, 20.96)
Obese Class 2 (35.00-39.99)	4687	17.53 (16.01, 19.06)	3492	39.39 (37.87, 40.92)	21.86 (21.56, 22.17)
Obese Class 3 (≥40.00)	2279	16.12 (14.58, 17.66)	1670	39.12 (37.58, 40.65)	23.00 (22.56, 23.44)

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 92.2% 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	23418	76.4	4840	15.8	1312	4.3	579	1.9	493	1.6	30642	100.0

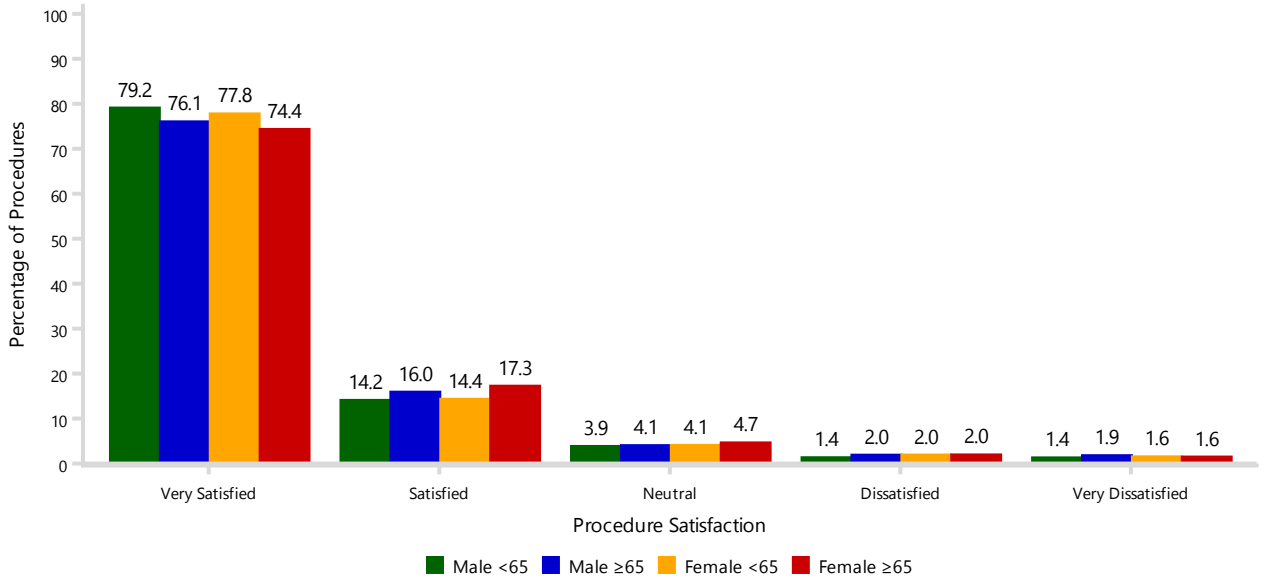
Note: Restricted to modern prostheses

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	4675	79.2	20.0	836	14.2	17.3	231	3.9	17.6	83	1.4	14.3	81	1.4	16.4	5906	100.0	19.3
	≥65	6132	76.1	26.2	1288	16.0	26.6	330	4.1	25.2	159	2.0	27.5	150	1.9	30.4	8059	100.0	26.3
Female	<65	4583	77.8	19.6	848	14.4	17.5	244	4.1	18.6	118	2.0	20.4	94	1.6	19.1	5887	100.0	19.2
	≥65	8028	74.4	34.3	1868	17.3	38.6	507	4.7	38.6	219	2.0	37.8	168	1.6	34.1	10790	100.0	35.2
TOTAL		**23418**	**76.4**	**100.0**	**4840**	**15.8**	**100.0**	**1312**	**4.3**	**100.0**	**579**	**1.9**	**100.0**	**493**	**1.6**	**100.0**	**30642**	**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	28176	92.0	1449	4.7	527	1.7	279	0.9	206	0.7	30637	100.0

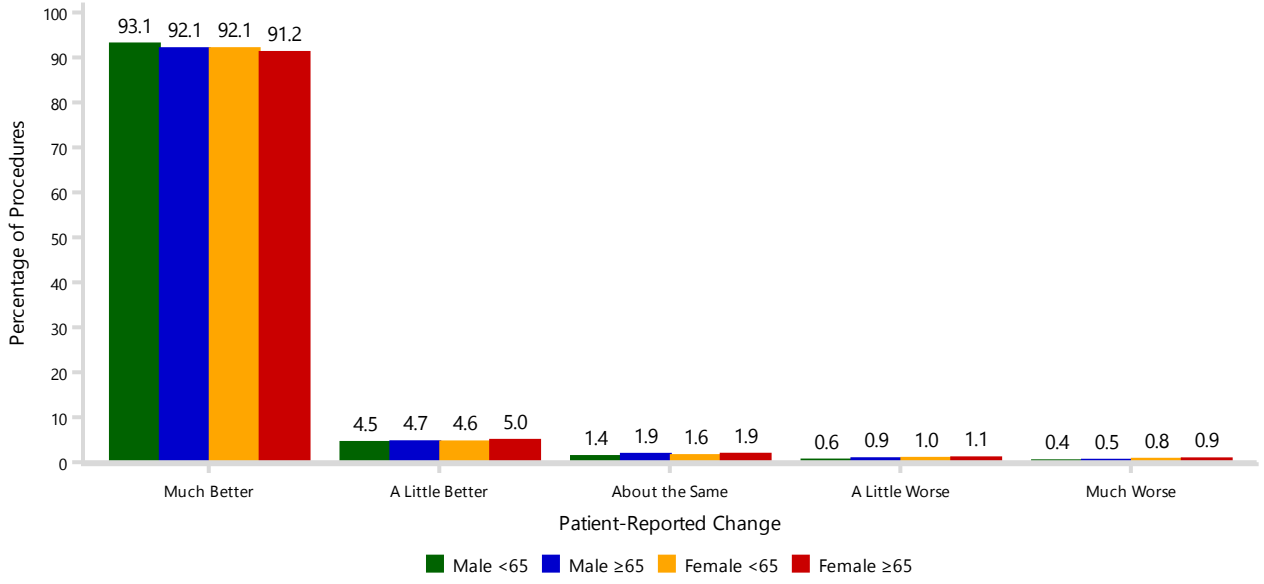
Note: Restricted to modern prostheses

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	5499	93.1	19.5	266	4.5	18.4	81	1.4	15.4	35	0.6	12.5	25	0.4	12.1	5906	100.0	19.3
	≥65	7418	92.1	26.3	375	4.7	25.9	150	1.9	28.5	71	0.9	25.4	44	0.5	21.4	8058	100.0	26.3
Female	<65	5419	92.1	19.2	272	4.6	18.8	93	1.6	17.6	57	1.0	20.4	45	0.8	21.8	5886	100.0	19.2
	≥65	9840	91.2	34.9	536	5.0	37.0	203	1.9	38.5	116	1.1	41.6	92	0.9	44.7	10787	100.0	35.2
TOTAL		**28176**	**92.0**	**100.0**	**1449**	**4.7**	**100.0**	**527**	**1.7**	**100.0**	**279**	**0.9**	**100.0**	**206**	**0.7**	**100.0**	**30637**	**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

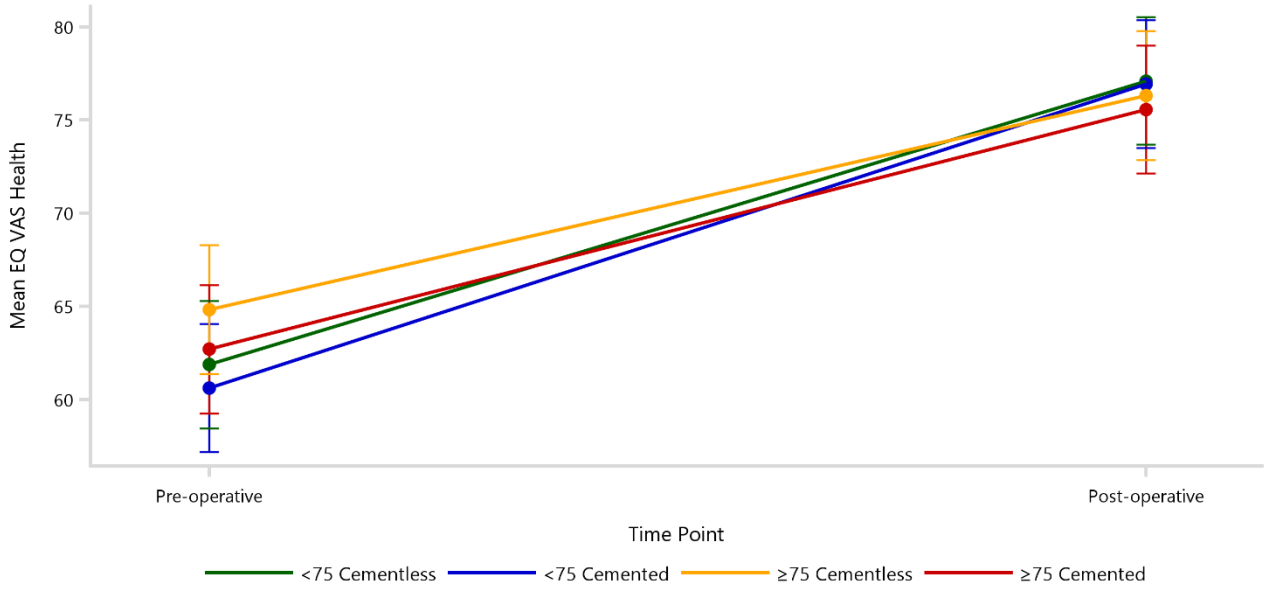
PROMs scores have also been analysed with respect to the method of femoral fixation when only cementless acetabular inserts were used. When patient age was considered for change in EQ-VAS there was no difference (Table SPR14 and Figure SPR11). There were no differences in the pre- to post-operative change 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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
<75	Cementless	21559	61.86 (58.44, 65.28)	16334	77.08 (73.66, 80.51)	15.22 (14.92, 15.53)
<75	Cemented	9048	60.61 (57.17, 64.04)	6897	76.91 (73.48, 80.34)	16.31 (15.84, 16.77)
≥75	Cementless	4053	64.81 (61.35, 68.28)	2990	76.31 (72.85, 79.76)	11.50 (10.79, 12.20)
≥75	Cemented	5553	62.69 (59.25, 66.14)	3981	75.55 (72.11, 78.99)	12.85 (12.24, 13.46)

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)



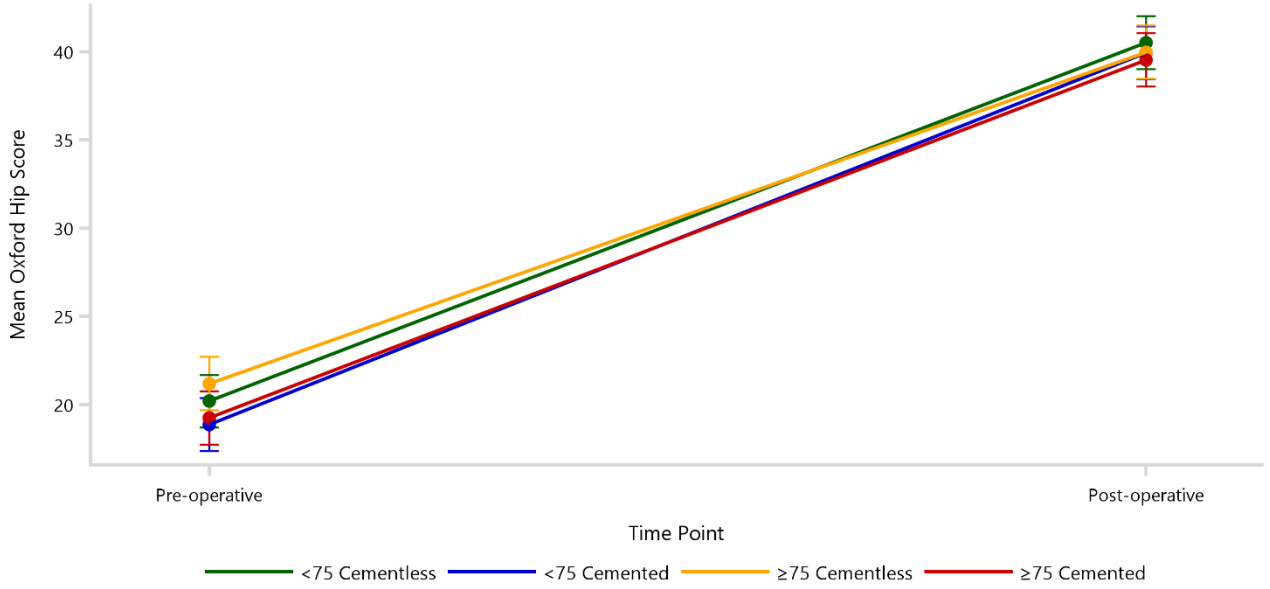
Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
<75	Cementless	21536	20.20 (18.70, 21.69)	16344	40.52 (39.02, 42.01)	20.32 (20.18, 20.46)
<75	Cemented	9060	18.87 (17.37, 20.37)	6898	39.94 (38.44, 41.44)	21.07 (20.85, 21.29)
≥75	Cementless	4051	21.20 (19.68, 22.72)	2993	39.97 (38.46, 41.48)	18.77 (18.44, 19.10)
≥75	Cemented	5560	19.24 (17.74, 20.75)	3993	39.54 (38.04, 41.05)	20.30 (20.01, 20.59)

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)



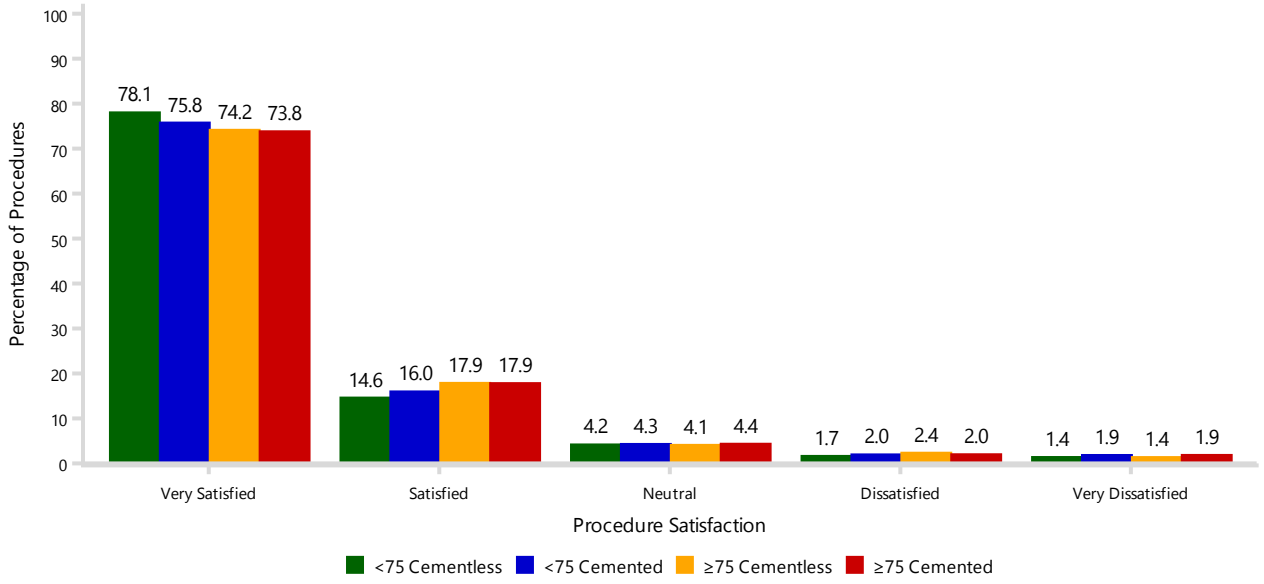
Note: Restricted to modern prostheses
Adjusted for gender, ASA score and BMI category

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	12733	78.1	55.1	2388	14.6	50.4	688	4.2	53.6	272	1.7	48.4	232	1.4	48.5	16313	100.0	54.1
	Cemented	5218	75.8	22.6	1102	16.0	23.3	298	4.3	23.2	138	2.0	24.6	129	1.9	27.0	6885	100.0	22.8
≥75	Cementless	2212	74.2	9.6	534	17.9	11.3	123	4.1	9.6	71	2.4	12.6	42	1.4	8.8	2982	100.0	9.9
	Cemented	2937	73.8	12.7	710	17.9	15.0	174	4.4	13.6	81	2.0	14.4	75	1.9	15.7	3977	100.0	13.2
TOTAL		23100	76.6	100.0	4734	15.7	100.0	1283	4.3	100.0	562	1.9	100.0	478	1.6	100.0	30157	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)



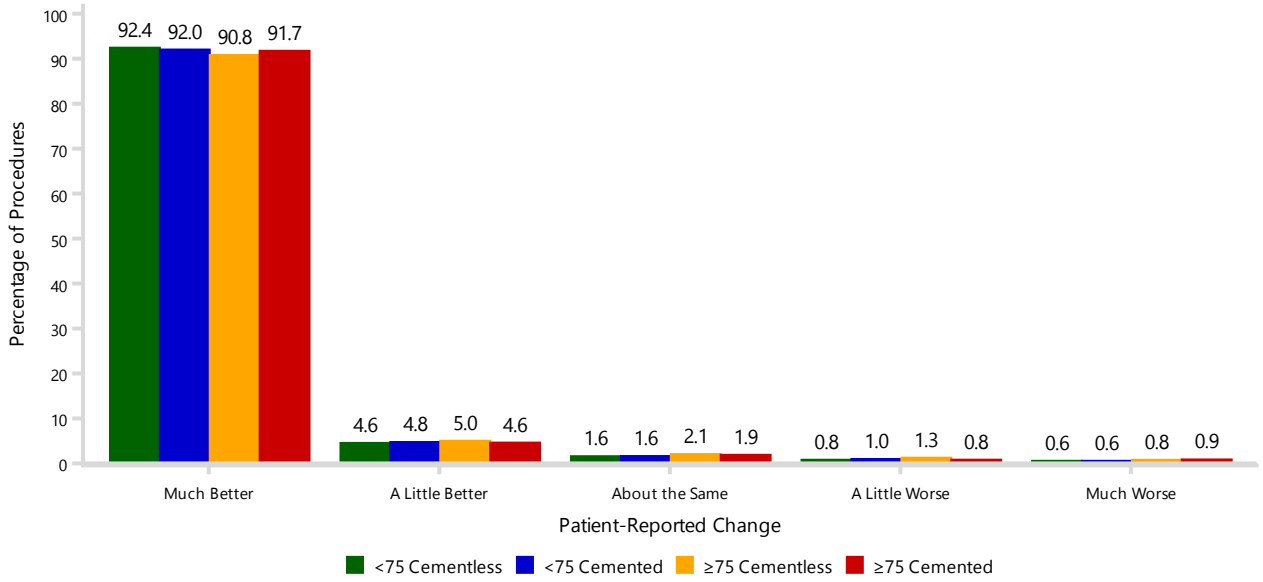
Note: Restricted to modern prostheses

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	15077	92.4	54.3	744	4.6	52.9	261	1.6	51.0	133	0.8	48.9	95	0.6	49.0	16310	100.0	54.1
	Cemented	6336	92.0	22.8	328	4.8	23.3	113	1.6	22.1	68	1.0	25.0	40	0.6	20.6	6885	100.0	22.8
≥75	Cementless	2708	90.8	9.8	150	5.0	10.7	62	2.1	12.1	38	1.3	14.0	24	0.8	12.4	2982	100.0	9.9
	Cemented	3647	91.7	13.1	184	4.6	13.1	76	1.9	14.8	33	0.8	12.1	35	0.9	18.0	3975	100.0	13.2
TOTAL		27768	92.1	100.0	1406	4.7	100.0	512	1.7	100.0	272	0.9	100.0	194	0.6	100.0	30152	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).

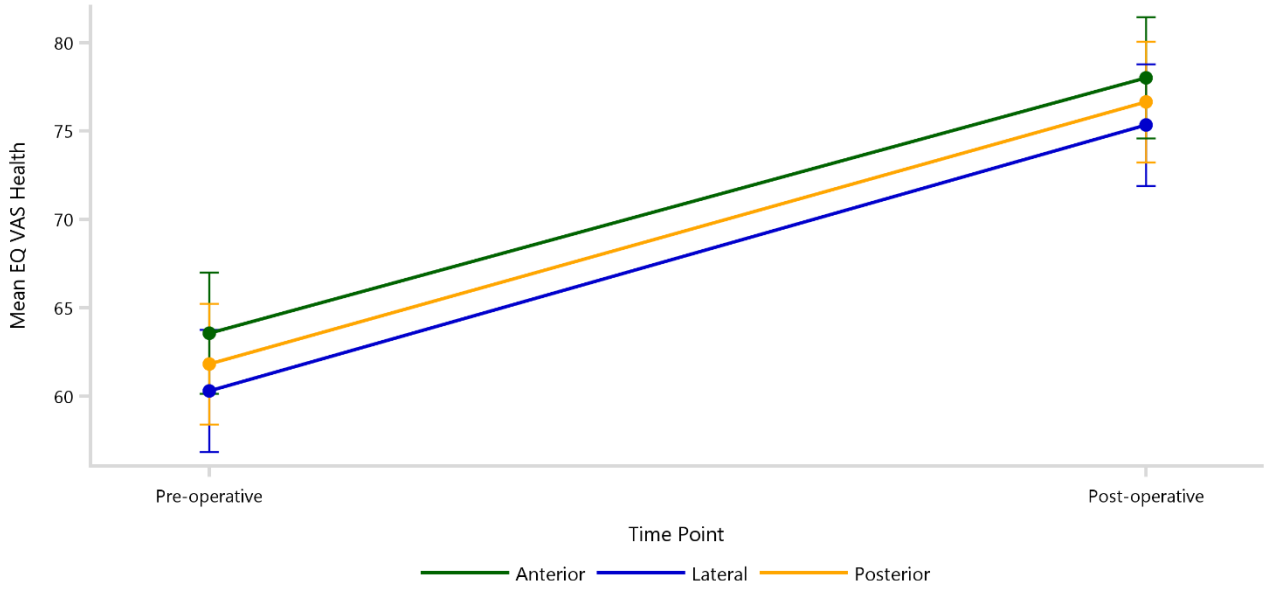
The patient-reported change of "much better" is slightly higher for the anterior approach compared to the lateral approach but was similar to the posterior approach (Table SPR21 and Figure SPR18).

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Anterior	10842	63.55 (60.12, 66.98)	8379	78.01 (74.58, 81.44)	14.46 (14.04, 14.89)
Lateral	3803	60.29 (56.82, 63.75)	2973	75.33 (71.88, 78.78)	15.05 (14.33, 15.76)
Posterior	26148	61.80 (58.38, 65.22)	19295	76.64 (73.22, 80.05)	14.83 (14.56, 15.11)

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

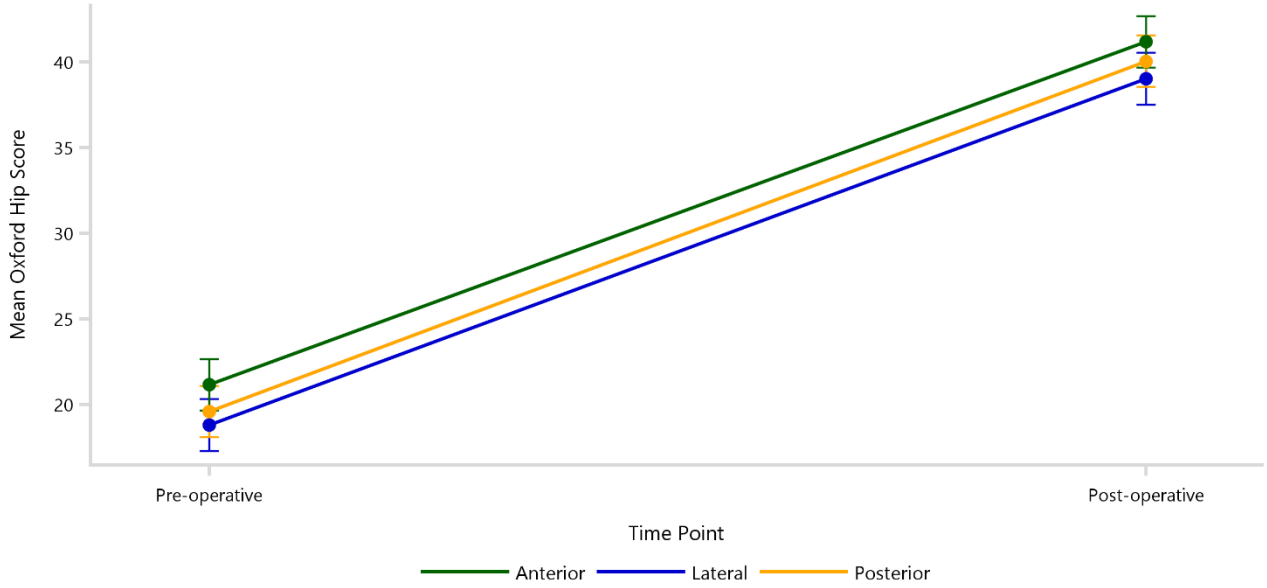
Table SPR19 Mean Pre-operative and Post-operative Oxford Hip Score in Primary Total Conventional Hip Replacement by Surgical Approach (Primary Diagnosis OA)

Surgical Approach	Pre-operative		Post-operative		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Anterior	10810	21.13 (19.62, 22.63)	8359	41.16 (39.66, 42.67)	20.04 (19.83, 20.24)
Lateral	3814	18.77 (17.26, 20.29)	2967	39.01 (37.50, 40.53)	20.24 (19.90, 20.58)
Posterior	26164	19.56 (18.06, 21.06)	19351	40.03 (38.54, 41.53)	20.47 (20.34, 20.60)

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

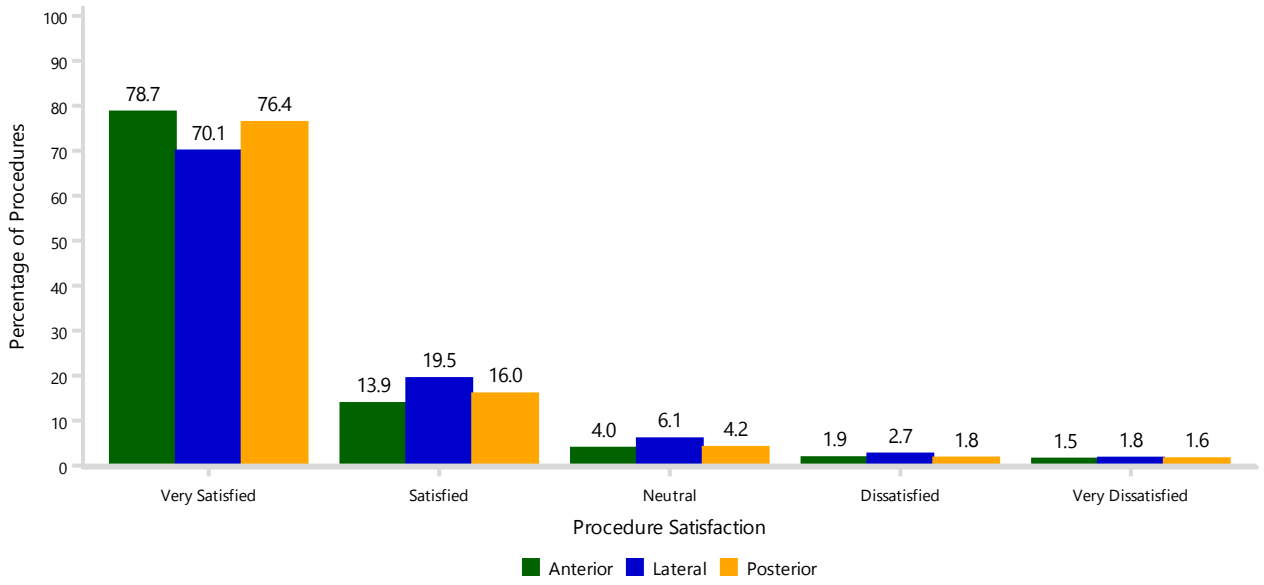
Adjusted for age, gender, ASA score and BMI category

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	6570	78.7	28.1	1161	13.9	24.0	331	4.0	25.2	155	1.9	26.8	129	1.5	26.2	8346	100.0	27.3
Lateral	2071	70.1	8.9	575	19.5	11.9	179	6.1	13.6	79	2.7	13.7	52	1.8	10.5	2956	100.0	9.7
Posterior	14748	76.4	63.1	3097	16.0	64.1	802	4.2	61.1	344	1.8	59.5	312	1.6	63.3	19303	100.0	63.1
TOTAL	**23389**	**76.4**	**100.0**	**4833**	**15.8**	**100.0**	**1312**	**4.3**	**100.0**	**578**	**1.9**	**100.0**	**493**	**1.6**	**100.0**	**30605**	**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)



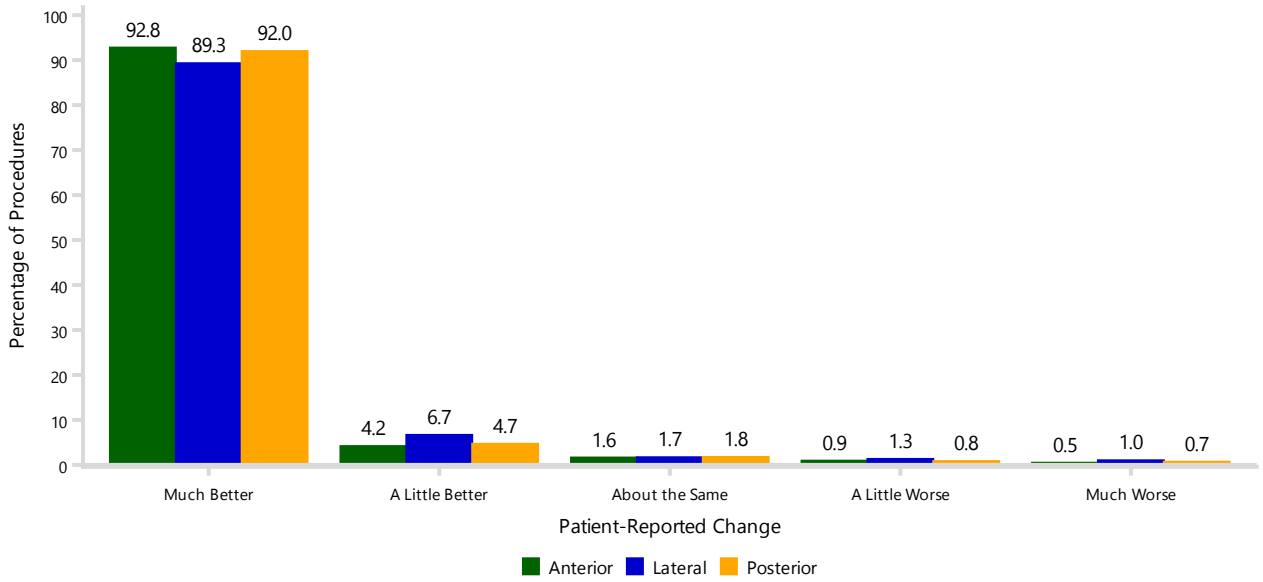
Note: Restricted to modern prostheses

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	7741	92.8	27.5	348	4.2	24.0	136	1.6	25.9	78	0.9	28.0	40	0.5	19.4	8343	100.0	27.3
Lateral	2640	89.3	9.4	197	6.7	13.6	50	1.7	9.5	39	1.3	14.0	30	1.0	14.6	2956	100.0	9.7
Posterior	17759	92.0	63.1	904	4.7	62.4	340	1.8	64.6	162	0.8	58.1	136	0.7	66.0	19301	100.0	63.1
TOTAL	**28140**	**92.0**	**100.0**	**1449**	**4.7**	**100.0**	**526**	**1.7**	**100.0**	**279**	**0.9**	**100.0**	**206**	**0.7**	**100.0**	**30600**	**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)



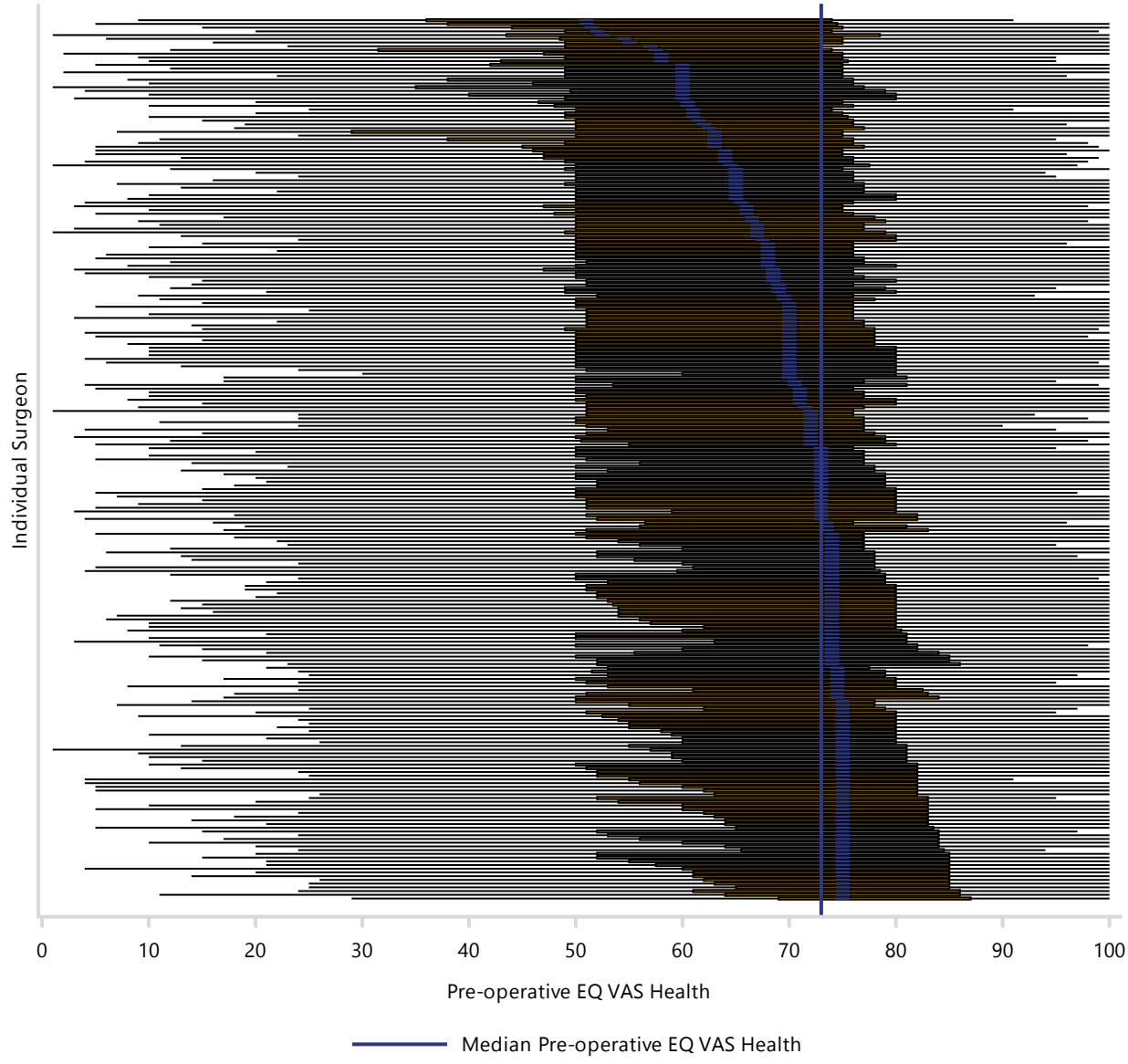
Note: Restricted to modern prostheses

SURGEON AND HOSPITAL PROMS

EQ-VAS

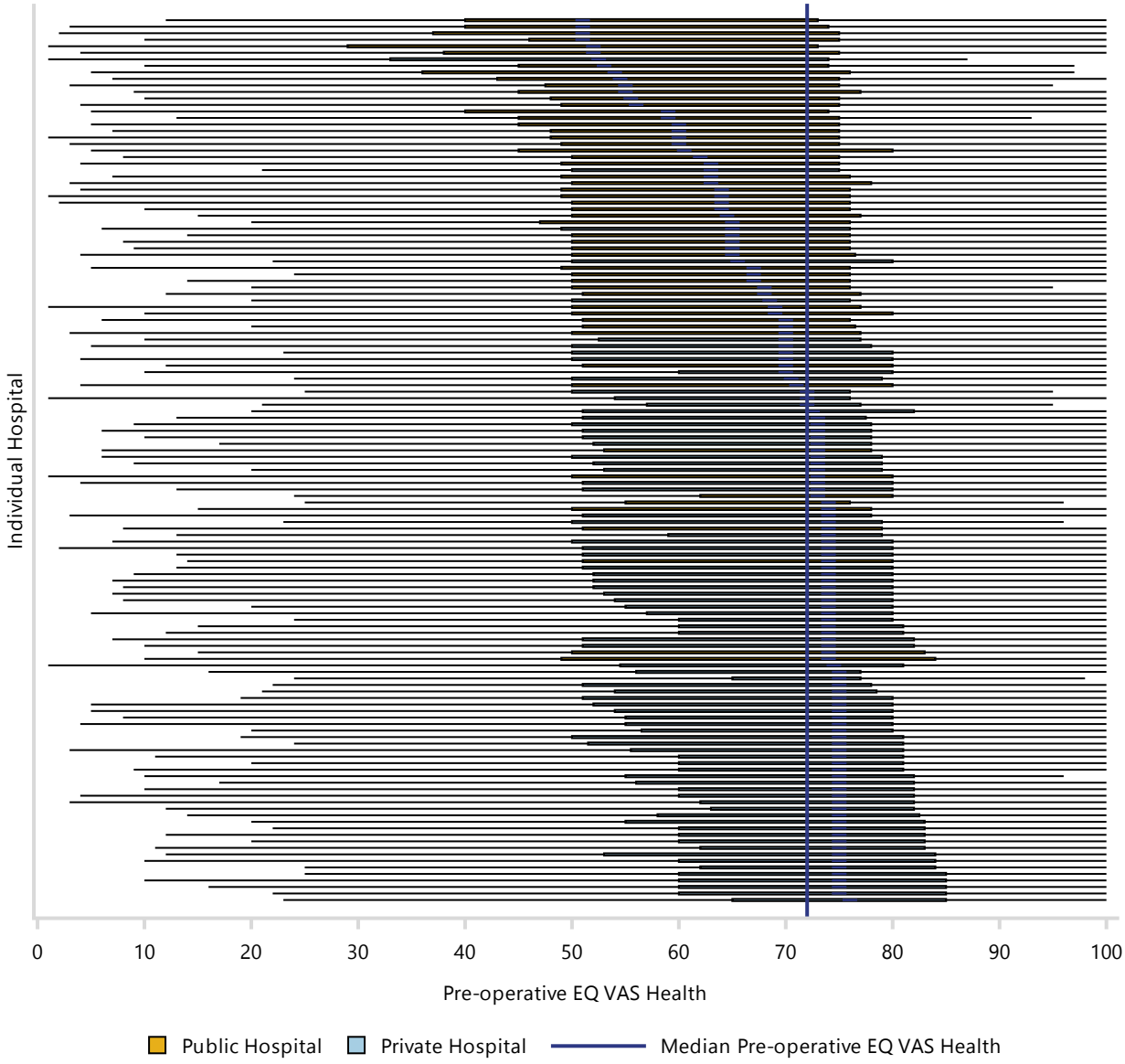
Variation between surgeons and between hospitals in the pre-operative EQ-VAS is displayed using 'caterpillar plots' for surgeons and hospitals with at least 50 recorded cases for primary total conventional hip replacement (Figure SPR19 and Figure SPR20). These analyses show pre-operative quality of life 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

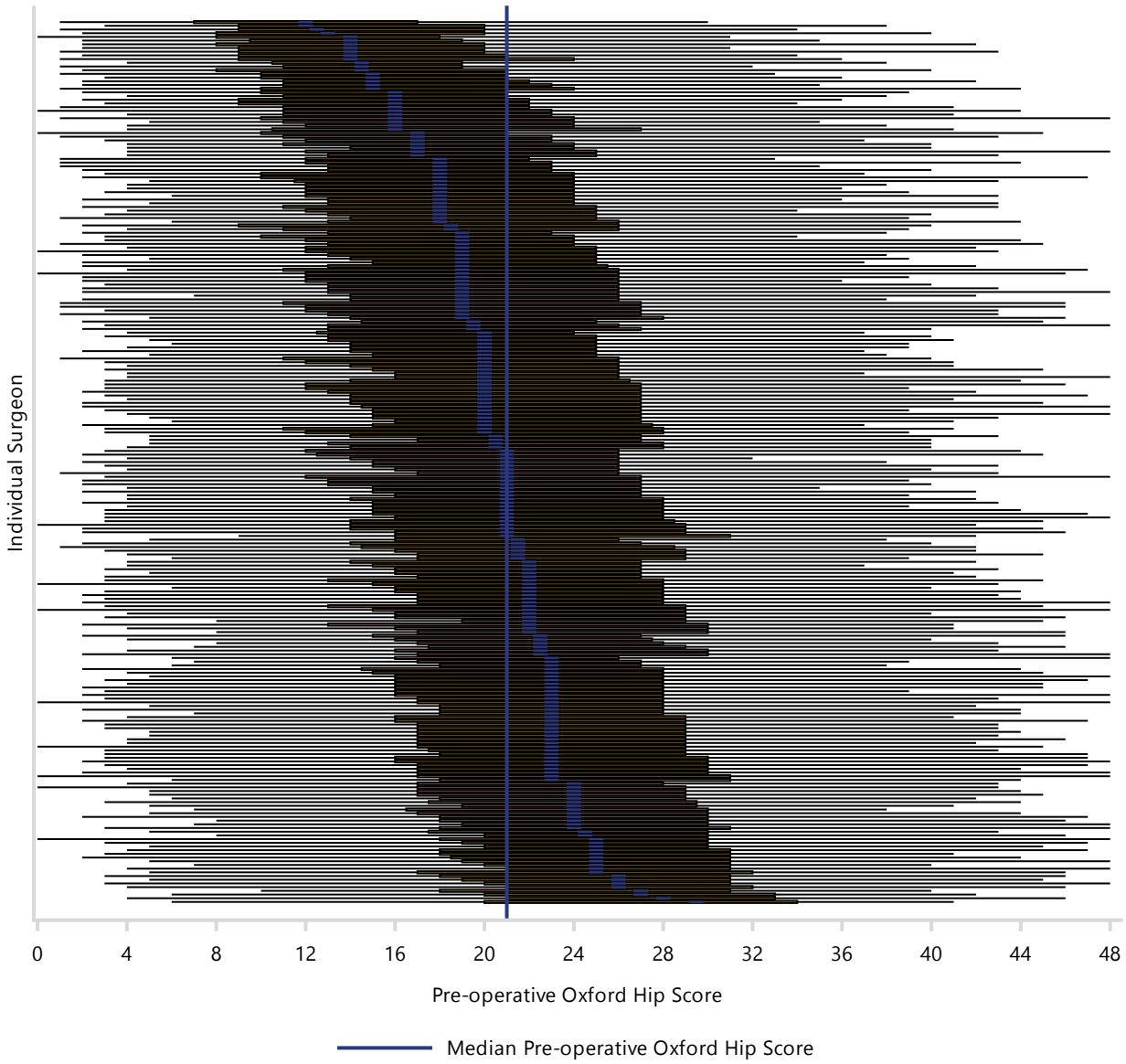
The median pre-operative EQ-VAS Health is 72

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.

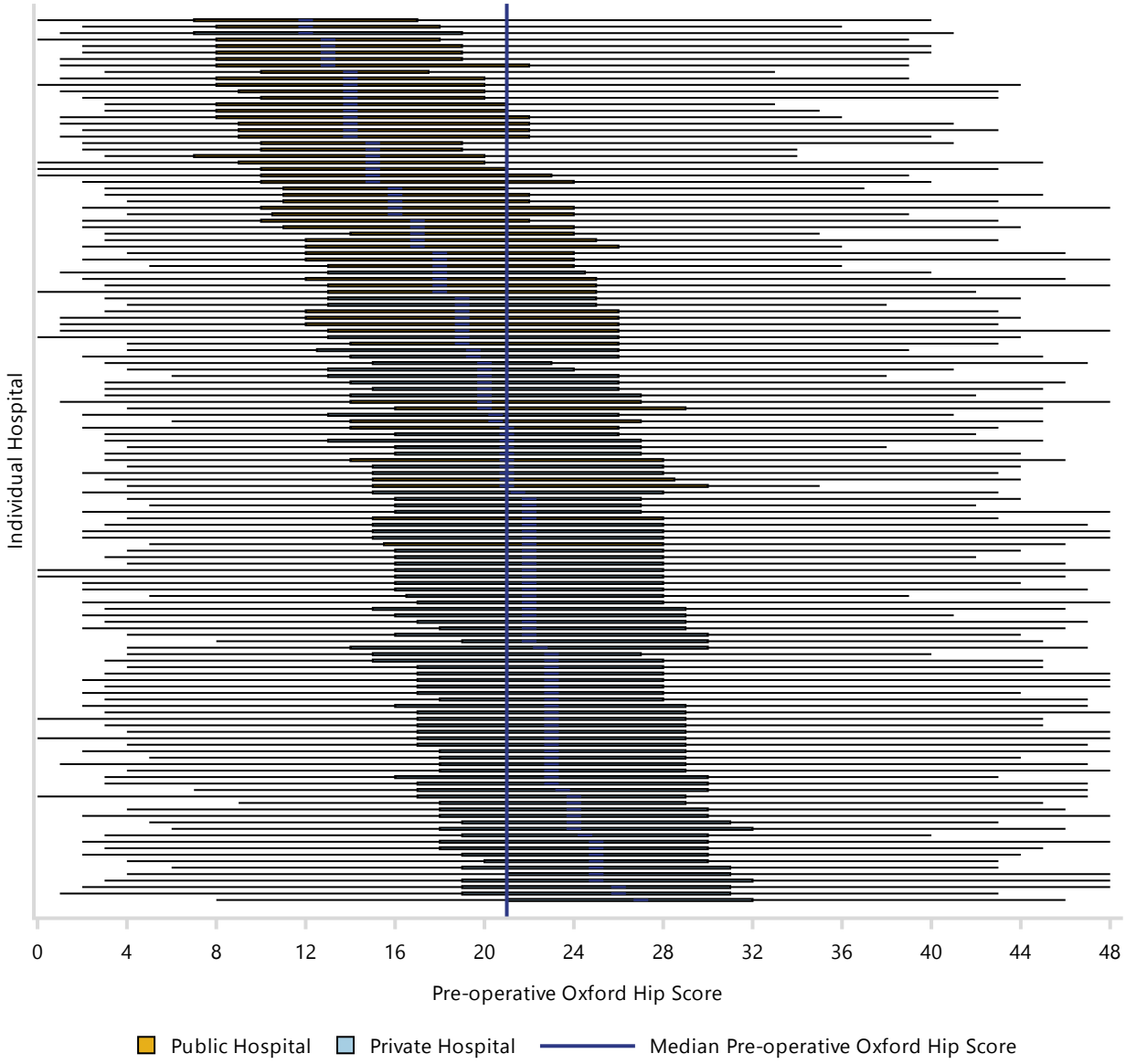
Individual medians are shown as blue squares, compared to the group median represented by the vertical blue line. Like the EQ-VAS analysis, public hospital patients generally have lower median preoperative Oxford hip scores compared to the national median.

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 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 (Table SPR23 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).

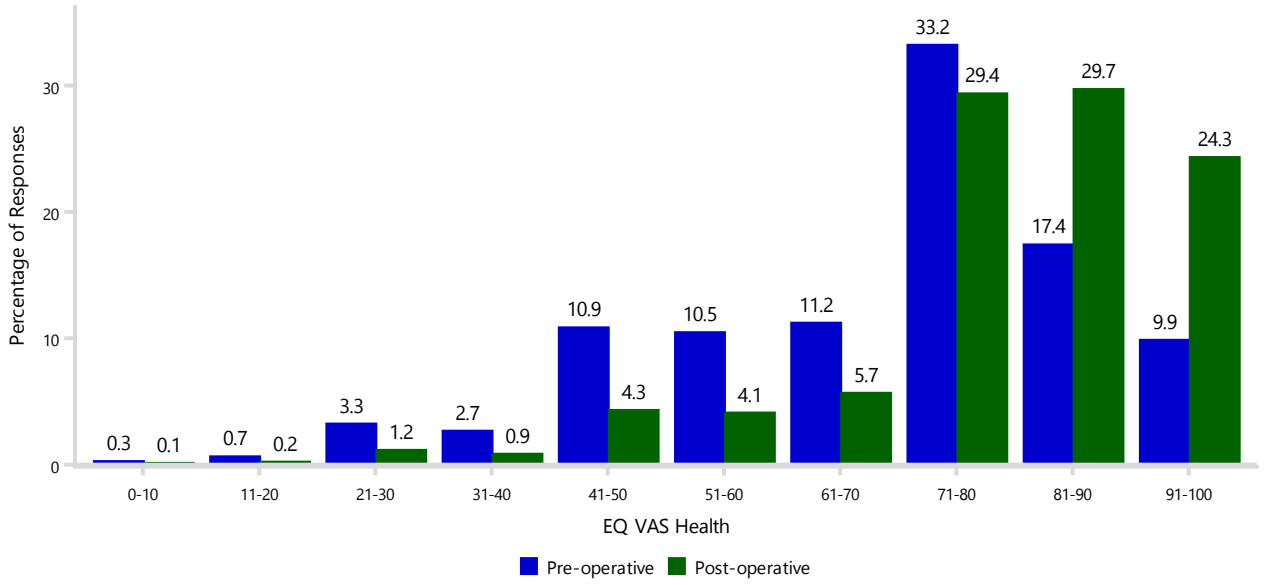
The mean EQ-VAS assessment before surgery decreases with each rise in BMI category, except in the underweight group. The magnitude of change increases with each BMI category (Table SPR25 and Figure SPR27).

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	65814	70.14(18.14)	75.00 (59.00, 83.00)	48796	80.26(15.27)	83.00 (75.00, 90.00)

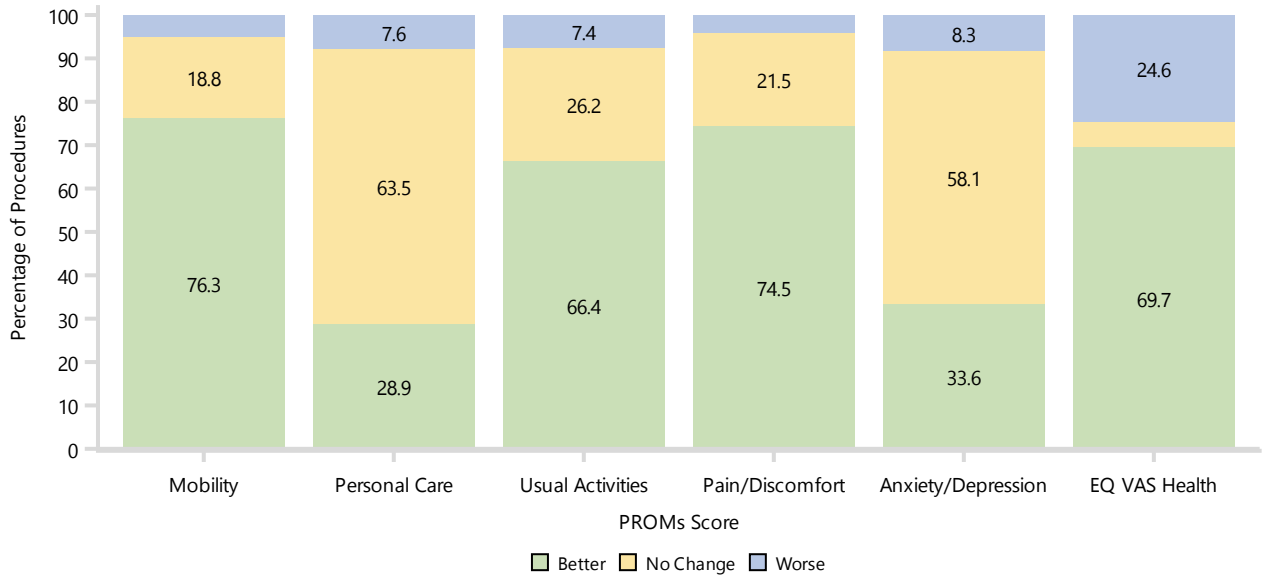
Note: Restricted to modern prostheses

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)



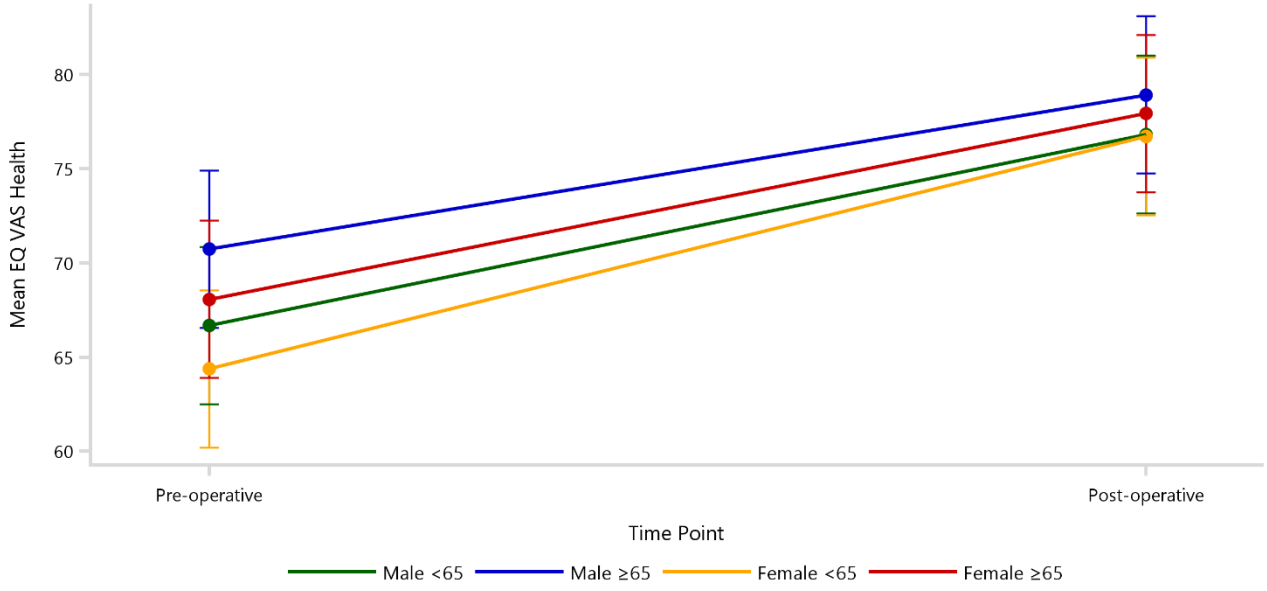
Note: Restricted to modern prostheses

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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
Male	<65	10738	66.66 (62.48, 70.85)	7879	76.82 (72.63, 81.00)	10.16 (9.76, 10.55)
	≥65	18833	70.73 (66.55, 74.91)	14060	78.92 (74.74, 83.10)	8.19 (7.90, 8.49)
Female	<65	12683	64.37 (60.19, 68.55)	9437	76.71 (72.53, 80.89)	12.34 (11.98, 12.70)
	≥65	23560	68.06 (63.89, 72.24)	17420	77.93 (73.75, 82.10)	9.86 (9.60, 10.13)

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)



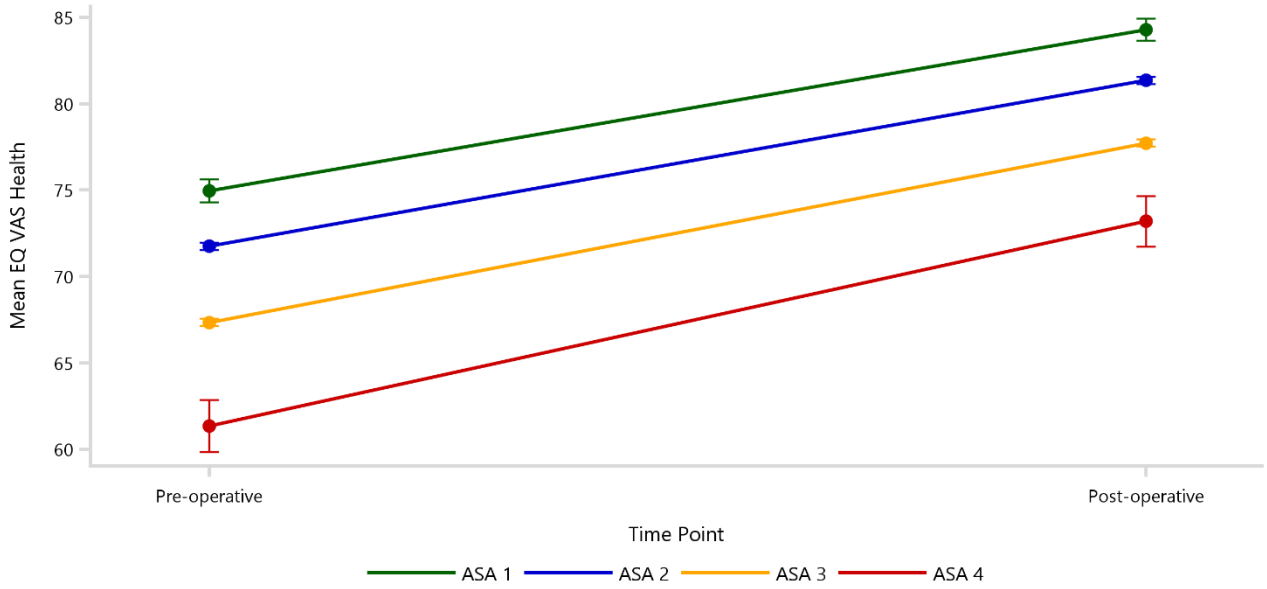
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 1	2806	74.96 (74.29, 75.63)	2233	84.28 (83.65, 84.91)	9.32 (8.57, 10.07)
ASA 2	34560	71.75 (71.54, 71.95)	25883	81.34 (81.14, 81.54)	9.59 (9.38, 9.81)
ASA 3	27851	67.34 (67.12, 67.55)	20227	77.71 (77.50, 77.92)	10.38 (10.13, 10.62)
ASA 4	527	61.34 (59.84, 62.84)	393	73.19 (71.73, 74.66)	11.86 (10.07, 13.64)

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)



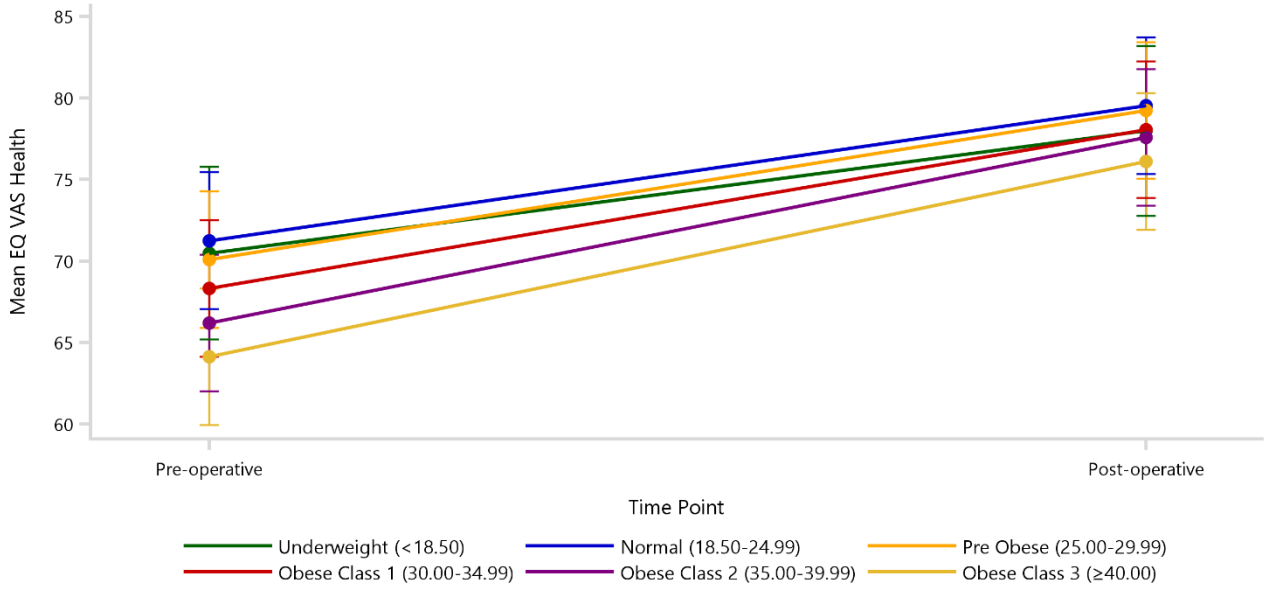
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Underweight (<18.50)	112	70.47 (65.18, 75.76)	87	77.97 (72.77, 83.17)	7.50 (3.72, 11.28)
Normal (18.50-24.99)	6658	71.24 (67.04, 75.43)	4850	79.52 (75.32, 83.71)	8.28 (7.78, 8.78)
Pre Obese (25.00-29.99)	20247	70.08 (65.90, 74.26)	15119	79.22 (75.04, 83.40)	9.14 (8.85, 9.42)
Obese Class 1 (30.00-34.99)	19993	68.31 (64.13, 72.49)	14769	78.04 (73.86, 82.22)	9.73 (9.44, 10.02)
Obese Class 2 (35.00-39.99)	11377	66.17 (61.99, 70.36)	8457	77.56 (73.37, 81.74)	11.38 (11.00, 11.76)
Obese Class 3 (≥40.00)	7022	64.12 (59.92, 68.31)	5217	76.09 (71.89, 80.28)	11.97 (11.49, 12.45)

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 23.1, and the mean post-operative score was 38.0. The minimal clinically important change in the OKS for a single group of patients is 9 points. The minimal important difference between groups of patients is 5 points (Table SPR26).

Similar to the EQ-VAS assessments, pre-operative mean OKS are 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	65665	23.10(8.44)	23.00 (17.00, 29.00)	48845	37.95(7.70)	40.00 (34.00, 44.00)

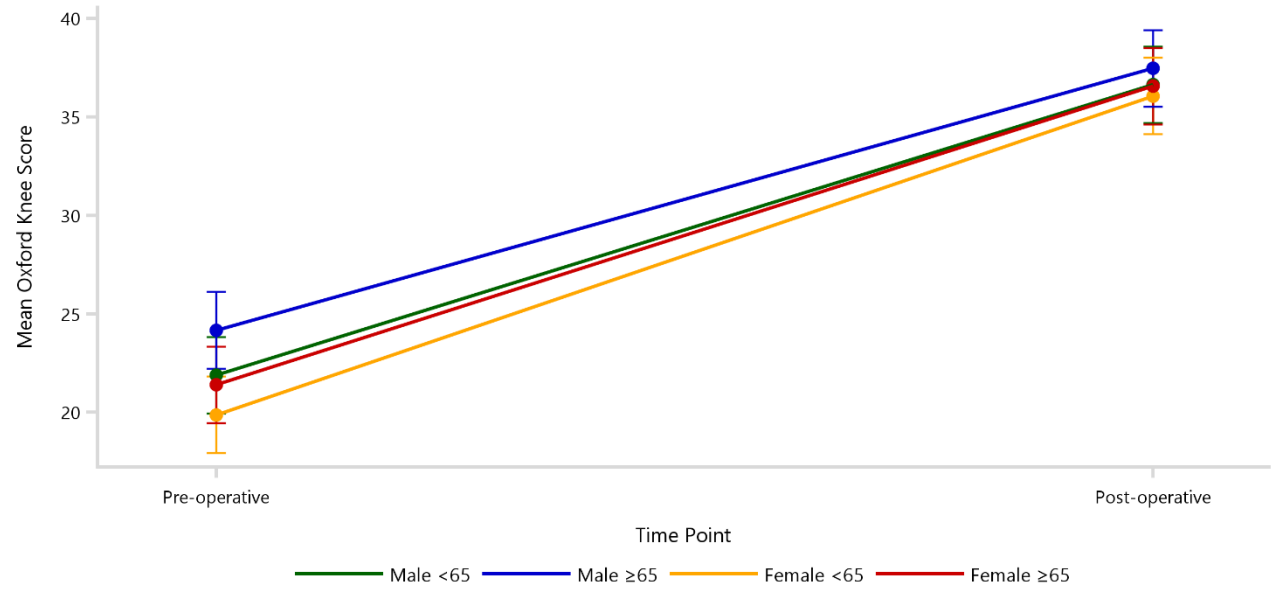
Note: Restricted to modern prostheses

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		Change in Score
		N	Mean (95% CI)	N	Mean (95% CI)	
Male	<65	10700	21.88 (19.93, 23.82)	7876	36.62 (34.67, 38.57)	14.74 (14.55, 14.94)
	≥65	18790	24.16 (22.21, 26.10)	14080	37.46 (35.51, 39.40)	13.30 (13.15, 13.45)
Female	<65	12638	19.87 (17.93, 21.82)	9429	36.05 (34.11, 38.00)	16.18 (16.00, 16.36)
	≥65	23537	21.39 (19.45, 23.33)	17460	36.55 (34.61, 38.49)	15.16 (15.03, 15.29)

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)



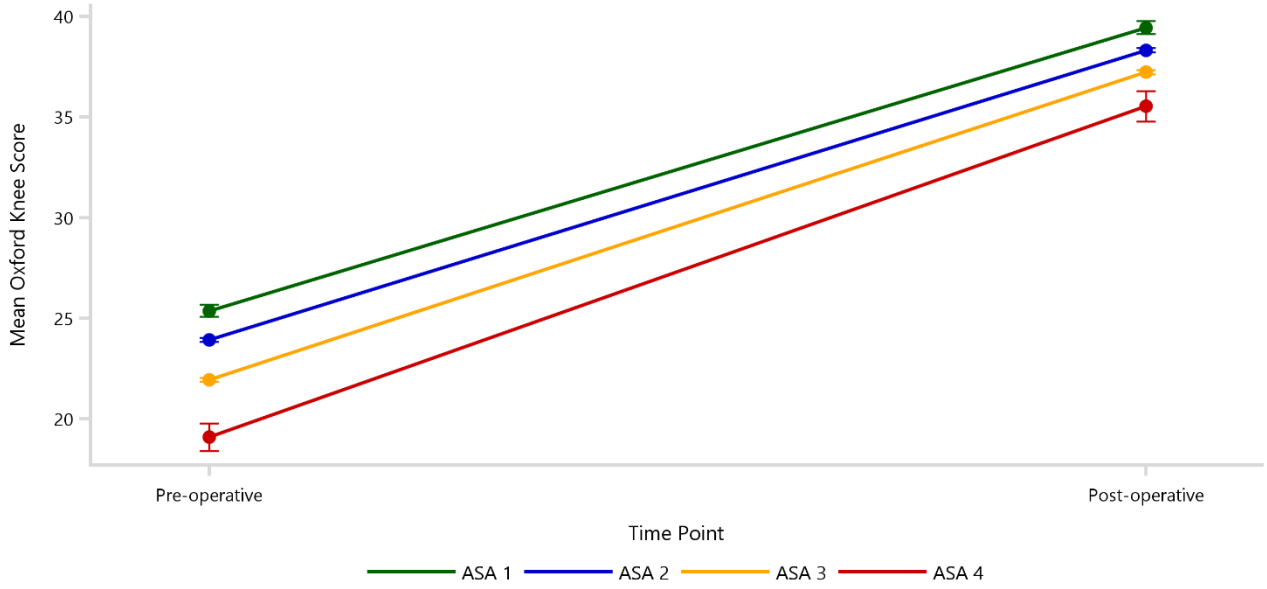
Note: Restricted to modern prostheses
Adjusted for ASA score and BMI category

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 1	2805	25.37 (25.06, 25.67)	2243	39.43 (39.11, 39.75)	14.06 (13.68, 14.44)
ASA 2	34447	23.92 (23.83, 24.02)	25918	38.31 (38.21, 38.41)	14.39 (14.28, 14.50)
ASA 3	27817	21.94 (21.84, 22.04)	20236	37.22 (37.11, 37.33)	15.28 (15.16, 15.41)
ASA 4	526	19.09 (18.40, 19.78)	389	35.53 (34.78, 36.28)	16.44 (15.54, 17.34)

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)



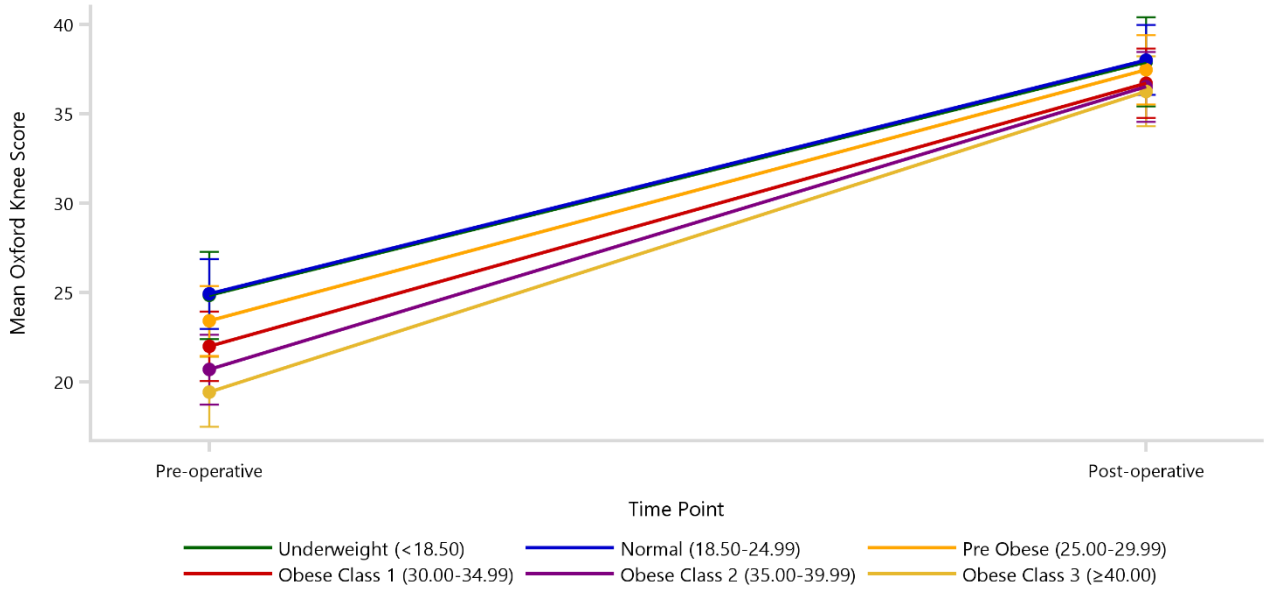
Note: Restricted to modern prostheses
Adjusted for age, gender and BMI category
Only ASA scores with >40 pre-operative and post-operative responses are listed

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Underweight (<18.50)	115	24.83 (22.40, 27.27)	88	37.90 (35.41, 40.40)	13.07 (11.19, 14.95)
Normal (18.50-24.99)	6638	24.91 (22.96, 26.87)	4873	38.00 (36.05, 39.95)	13.09 (12.84, 13.34)
Pre Obese (25.00-29.99)	20212	23.41 (21.46, 25.35)	15119	37.46 (35.51, 39.41)	14.05 (13.91, 14.20)
Obese Class 1 (30.00-34.99)	19946	21.99 (20.04, 23.94)	14788	36.71 (34.76, 38.65)	14.72 (14.57, 14.86)
Obese Class 2 (35.00-39.99)	11355	20.68 (18.74, 22.63)	8465	36.50 (34.55, 38.45)	15.82 (15.63, 16.01)
Obese Class 3 (≥40.00)	6997	19.43 (17.48, 21.38)	5217	36.25 (34.30, 38.20)	16.82 (16.58, 17.06)

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, 85.7% 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 (92.5%) 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	29422	60.3	12378	25.4	4420	9.1	1746	3.6	791	1.6	48757	100.0

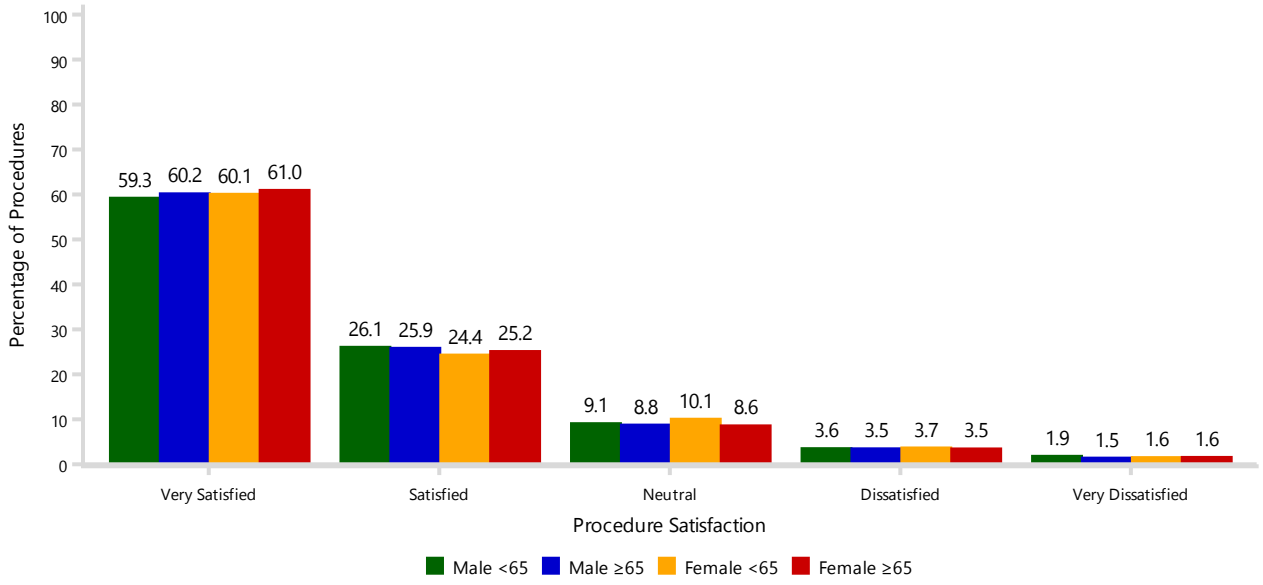
Note: Restricted to modern prostheses

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	4663	59.3	15.8	2055	26.1	16.6	719	9.1	16.3	282	3.6	16.2	148	1.9	18.7	7867	100.0	16.1
	≥65	8471	60.2	28.8	3641	25.9	29.4	1241	8.8	28.1	499	3.5	28.6	208	1.5	26.3	14060	100.0	28.8
Female	<65	5664	60.1	19.3	2297	24.4	18.6	954	10.1	21.6	352	3.7	20.2	150	1.6	19.0	9417	100.0	19.3
	≥65	10624	61.0	36.1	4385	25.2	35.4	1506	8.6	34.1	613	3.5	35.1	285	1.6	36.0	17413	100.0	35.7
TOTAL		**29422**	**60.3**	**100.0**	**12378**	**25.4**	**100.0**	**4420**	**9.1**	**100.0**	**1746**	**3.6**	**100.0**	**791**	**1.6**	**100.0**	**48757**	**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	39994	82.0	5133	10.5	1740	3.6	1186	2.4	697	1.4	48750	100.0

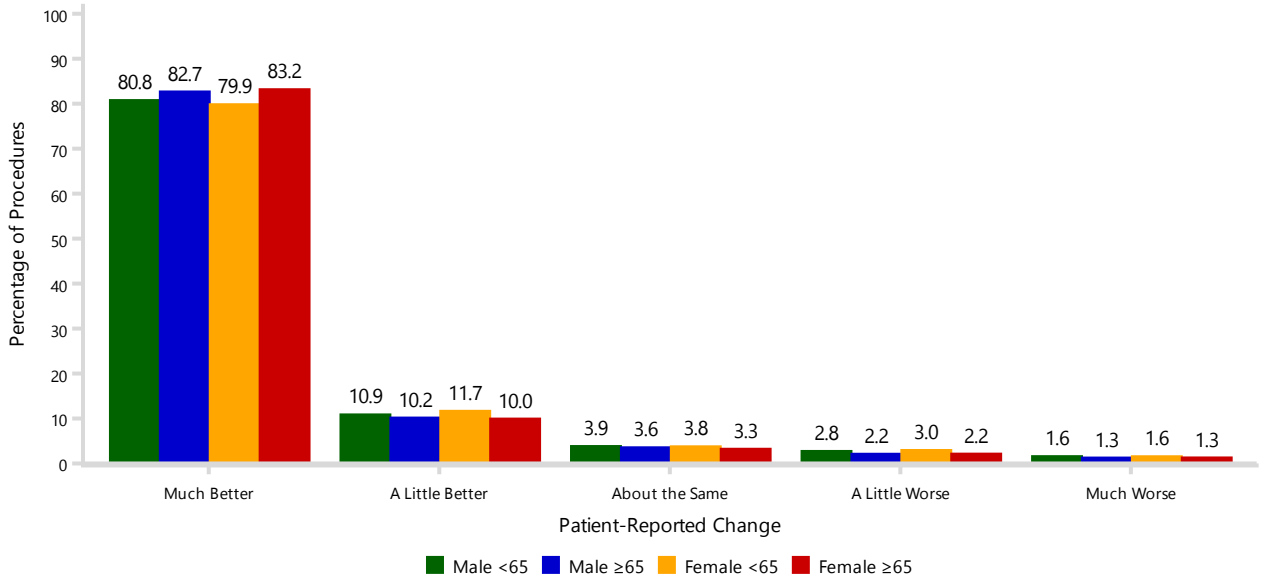
Note: Restricted to modern prostheses

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	6356	80.8	15.9	858	10.9	16.7	305	3.9	17.5	219	2.8	18.5	128	1.6	18.4	7866	100.0	16.1
	≥65	11629	82.7	29.1	1435	10.2	28.0	506	3.6	29.1	304	2.2	25.6	185	1.3	26.5	14059	100.0	28.8
Female	<65	7519	79.9	18.8	1102	11.7	21.5	359	3.8	20.6	282	3.0	23.8	151	1.6	21.7	9413	100.0	19.3
	≥65	14490	83.2	36.2	1738	10.0	33.9	570	3.3	32.8	381	2.2	32.1	233	1.3	33.4	17412	100.0	35.7
TOTAL		**39994**	**82.0**	**100.0**	**5133**	**10.5**	**100.0**	**1740**	**3.6**	**100.0**	**1186**	**2.4**	**100.0**	**697**	**1.4**	**100.0**	**48750**	**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

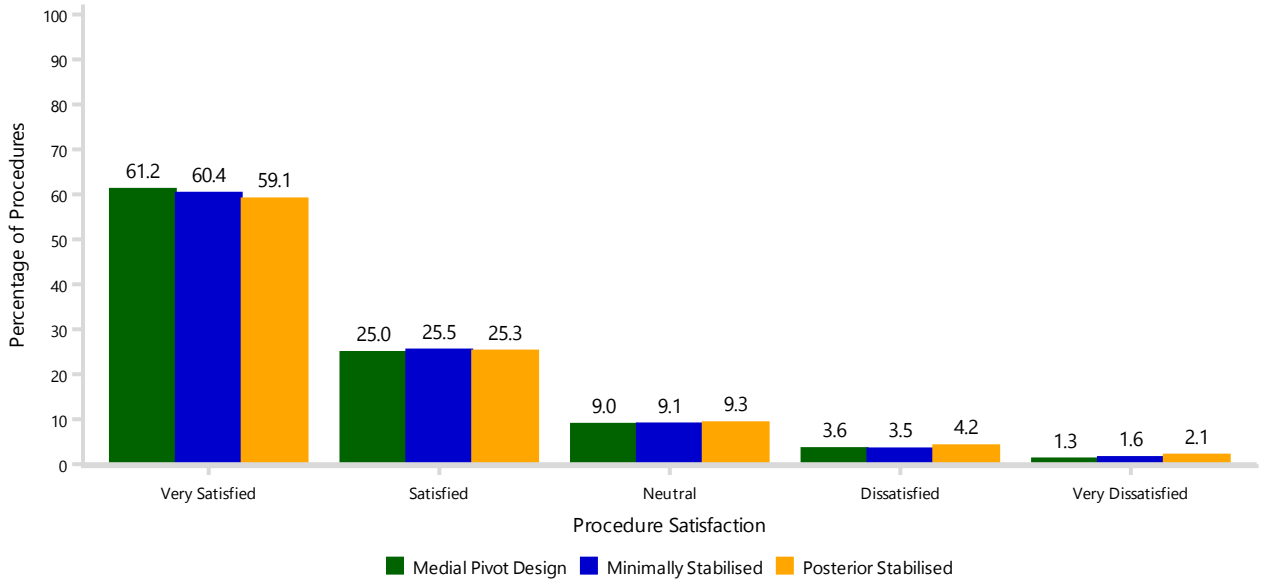
PROMs outcomes are reported with respect to selected prosthesis characteristics. Patient satisfaction (the proportion of patients who are satisfied or very satisfied) following knee replacement ranges from 84.4% to 86.2% when prosthesis stability is considered (Table SPR34 and Figure SPR33). For all stability types, patient-reported change (the proportion of patients who are much better or a little better) is over 92.5% (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	2878	61.2	9.9	1173	25.0	9.5	422	9.0	9.6	168	3.6	9.7	60	1.3	7.6	4701	100.0	9.7
Minimally Stabilised	22803	60.4	78.2	9631	25.5	78.4	3422	9.1	77.9	1324	3.5	76.1	600	1.6	76.4	37780	100.0	78.1
Posterior Stabilised	3476	59.1	11.9	1486	25.3	12.1	548	9.3	12.5	247	4.2	14.2	125	2.1	15.9	5882	100.0	12.2
TOTAL	**29157**	**60.3**	**100.0**	**12290**	**25.4**	**100.0**	**4392**	**9.1**	**100.0**	**1739**	**3.6**	**100.0**	**785**	**1.6**	**100.0**	**48363**	**100.0**	**100.0**

Note: Restricted to modern prostheses

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



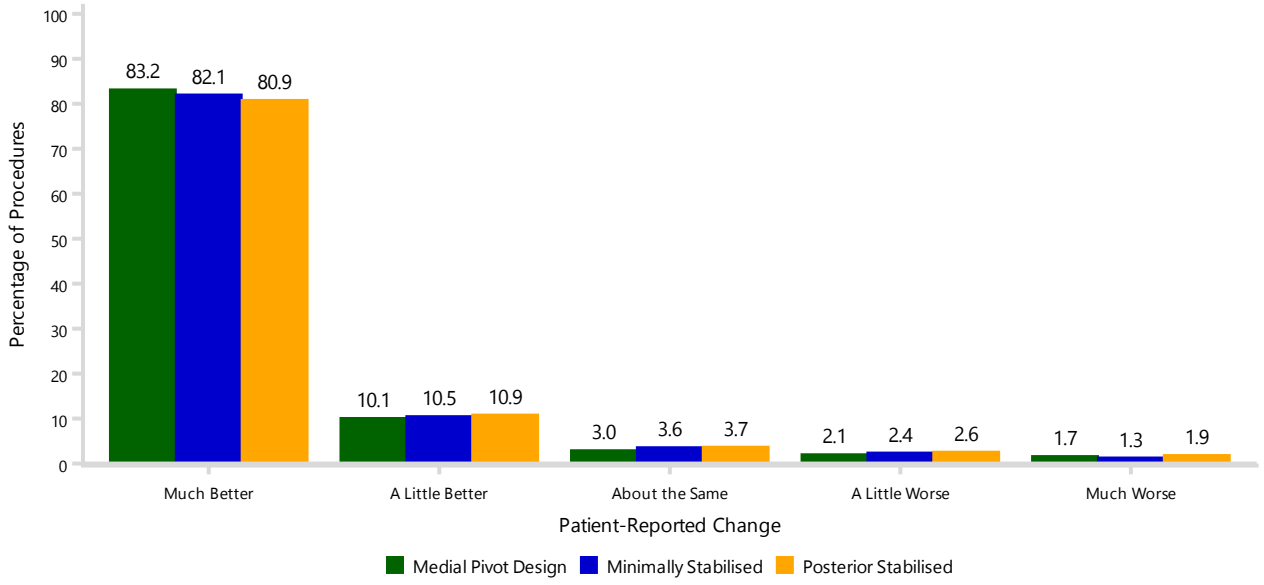
Note: Restricted to modern prostheses

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	3909	83.2	9.9	476	10.1	9.3	139	3.0	8.0	97	2.1	8.3	78	1.7	11.2	4699	100.0	9.7
Minimally Stabilised	30997	82.1	78.2	3980	10.5	78.1	1371	3.6	79.2	921	2.4	78.5	507	1.3	72.8	37776	100.0	78.1
Posterior Stabilised	4755	80.9	12.0	640	10.9	12.6	220	3.7	12.7	155	2.6	13.2	111	1.9	15.9	5881	100.0	12.2
TOTAL	**39661**	**82.0**	**100.0**	**5096**	**10.5**	**100.0**	**1730**	**3.6**	**100.0**	**1173**	**2.4**	**100.0**	**696**	**1.4**	**100.0**	**48356**	**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

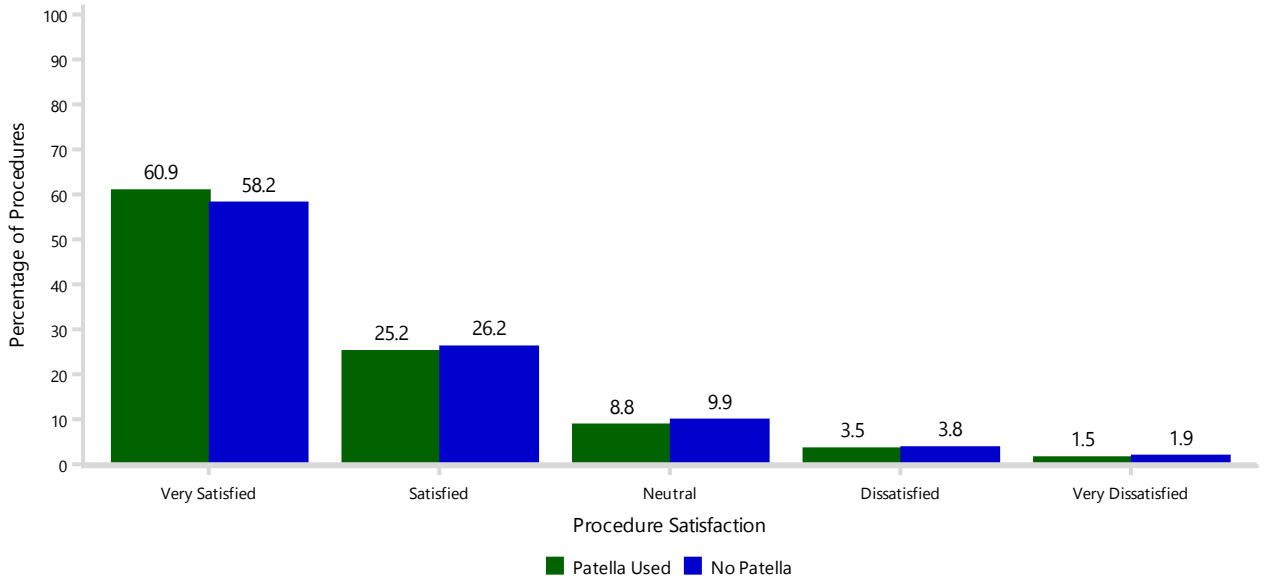
Post-operative satisfaction and patient-reported change are similar when analysed by patella component use (Table SPR36, Figure SPR35, Table SPR37 and Figure SPR36).

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	23514	60.9	79.9	9719	25.2	78.5	3412	8.8	77.2	1362	3.5	78.0	597	1.5	75.5	38604	100.0	79.2
No Patella	5908	58.2	20.1	2659	26.2	21.5	1008	9.9	22.8	384	3.8	22.0	194	1.9	24.5	10153	100.0	20.8
TOTAL	**29422**	**60.3**	**100.0**	**12378**	**25.4**	**100.0**	**4420**	**9.1**	**100.0**	**1746**	**3.6**	**100.0**	**791**	**1.6**	**100.0**	**48757**	**100.0**	**100.0**

Note: Restricted to modern prostheses

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



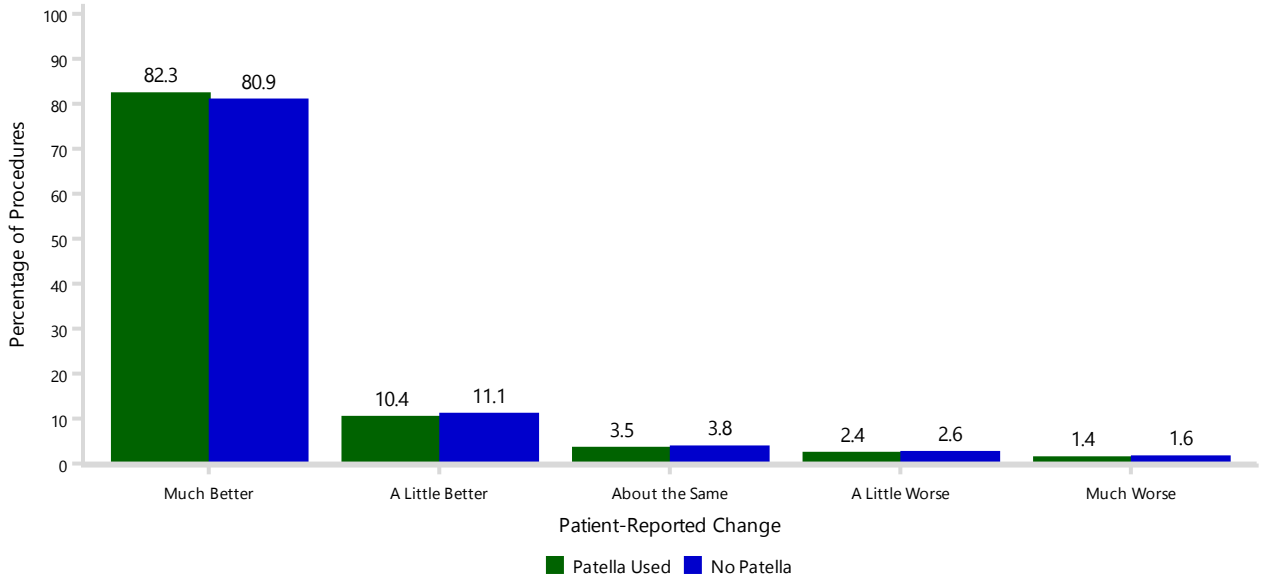
Note: Restricted to modern prostheses

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	31779	82.3	79.5	4009	10.4	78.1	1354	3.5	77.8	924	2.4	77.9	535	1.4	76.8	38601	100.0	79.2
No Patella	8215	80.9	20.5	1124	11.1	21.9	386	3.8	22.2	262	2.6	22.1	162	1.6	23.2	10149	100.0	20.8
TOTAL	**39994**	**82.0**	**100.0**	**5133**	**10.5**	**100.0**	**1740**	**3.6**	**100.0**	**1186**	**2.4**	**100.0**	**697**	**1.4**	**100.0**	**48750**	**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 83.9% for each surgical technique (Table SPR38 and Figure SPR37).

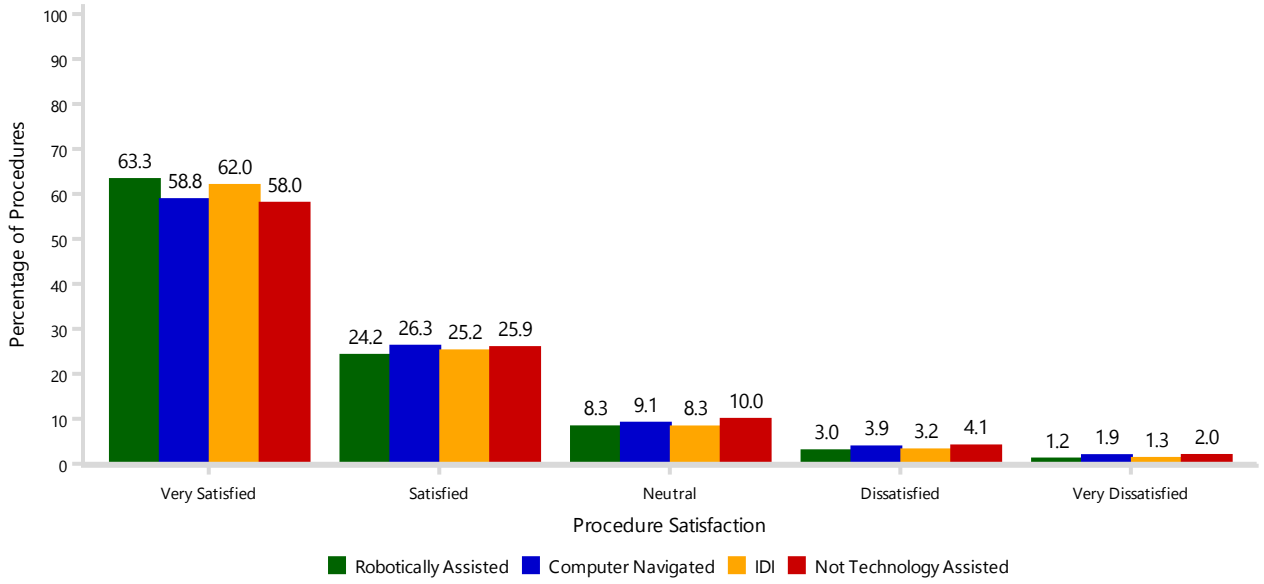
Change after surgery is reported as much better in over 81.8% of procedures with each surgical technique used with assistive performance (Table SPR39 and Figure SPR38).

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	9670	63.3	32.9	3699	24.2	29.9	1270	8.3	28.7	457	3.0	26.2	178	1.2	22.5	15274	100.0	31.3
Computer Navigated	6624	58.8	22.5	2955	26.3	23.9	1028	9.1	23.3	434	3.9	24.9	216	1.9	27.3	11257	100.0	23.1
IDI	3573	62.0	12.1	1453	25.2	11.7	478	8.3	10.8	184	3.2	10.5	75	1.3	9.5	5763	100.0	11.8
Not Technology Assisted	9555	58.0	32.5	4271	25.9	34.5	1644	10.0	37.2	671	4.1	38.4	322	2.0	40.7	16463	100.0	33.8
TOTAL	**29422**	**60.3**	**100.0**	**12378**	**25.4**	**100.0**	**4420**	**9.1**	**100.0**	**1746**	**3.6**	**100.0**	**791**	**1.6**	**100.0**	**48757**	**100.0**	**100.0**

Note: Restricted to modern prostheses

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



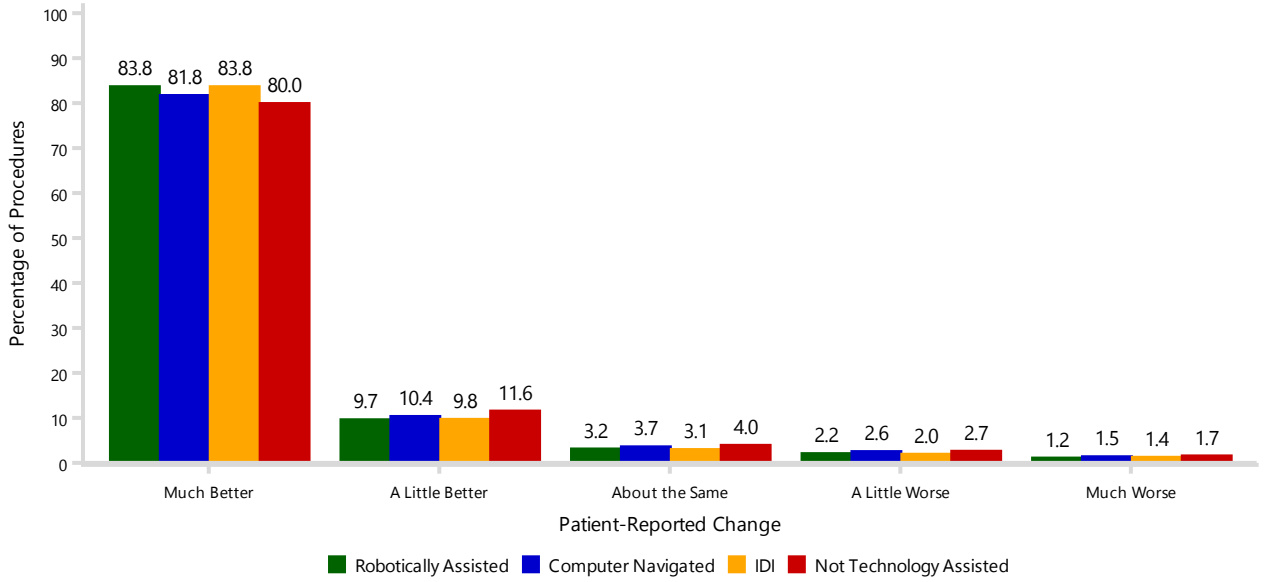
Note: Restricted to modern prostheses

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	12790	83.8	32.0	1481	9.7	28.9	489	3.2	28.1	331	2.2	27.9	180	1.2	25.8	15271	100.0	31.3
Computer Navigated	9207	81.8	23.0	1174	10.4	22.9	414	3.7	23.8	295	2.6	24.9	166	1.5	23.8	11256	100.0	23.1
IDI	4826	83.8	12.1	564	9.8	11.0	177	3.1	10.2	117	2.0	9.9	78	1.4	11.2	5762	100.0	11.8
Not Technology Assisted	13171	80.0	32.9	1914	11.6	37.3	660	4.0	37.9	443	2.7	37.4	273	1.7	39.2	16461	100.0	33.8
TOTAL	**39994**	**82.0**	**100.0**	**5133**	**10.5**	**100.0**	**1740**	**3.6**	**100.0**	**1186**	**2.4**	**100.0**	**697**	**1.4**	**100.0**	**48750**	**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)



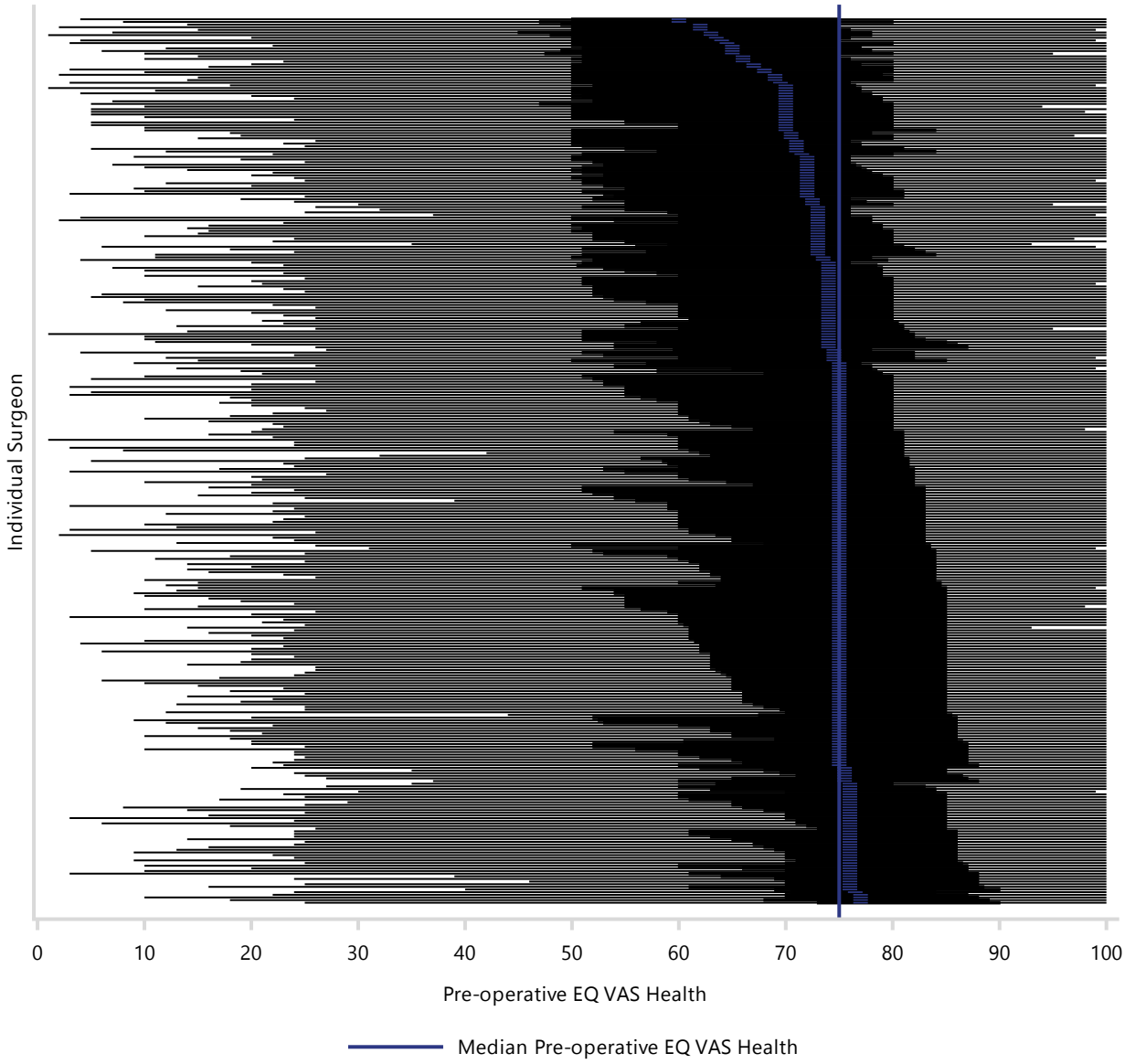
Note: Restricted to modern prostheses

SURGEON AND HOSPITAL PROMS

EQ-VAS

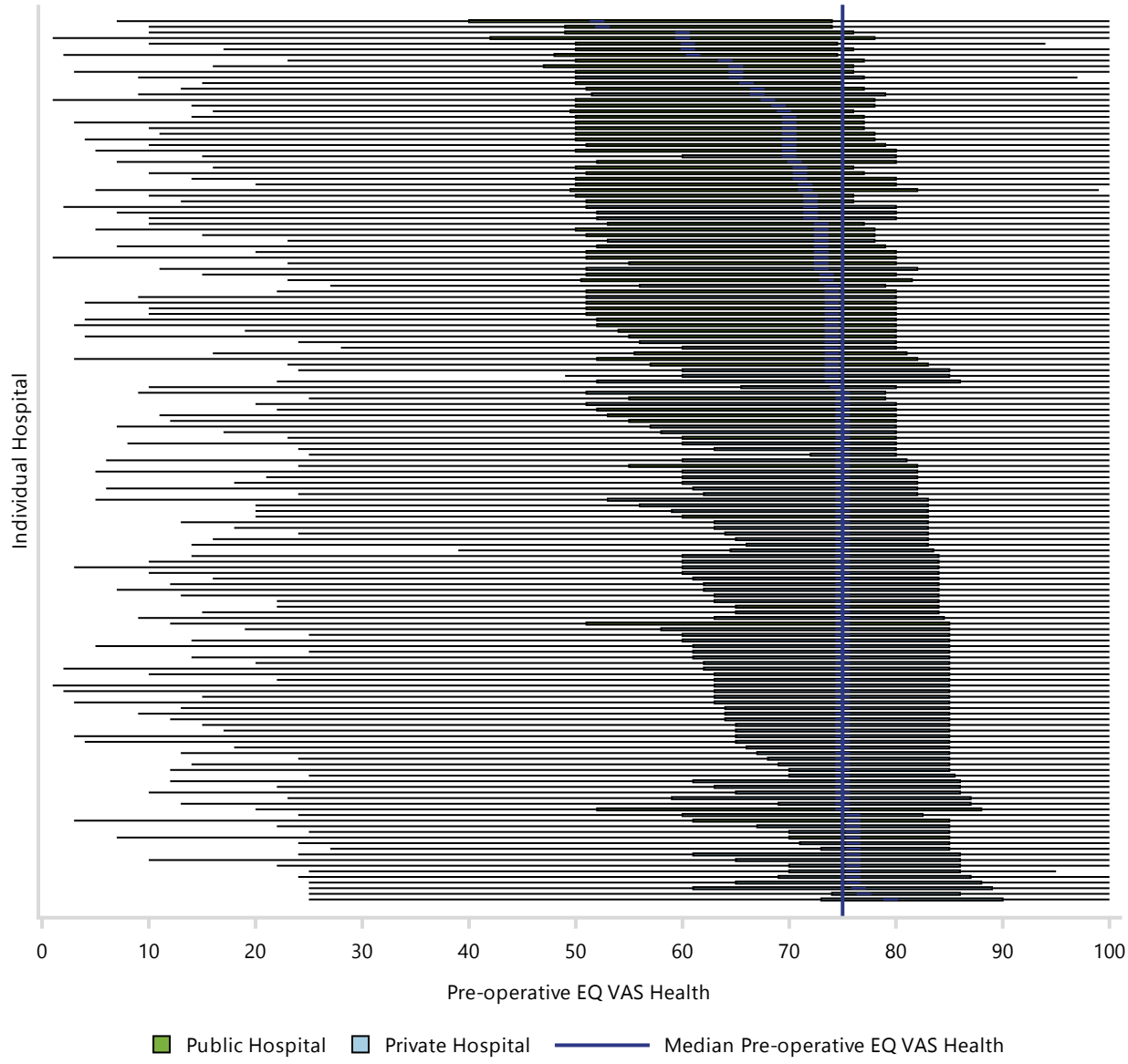
Variation between surgeons and between hospitals in the EQ-VAS is displayed as 'caterpillar plots' for surgeons and hospitals with at least 50 recorded cases for knee replacement (Figure SPR39 to Figure SPR40). These analyses show pre-operative quality of life assessments for patients of individual surgeons 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)

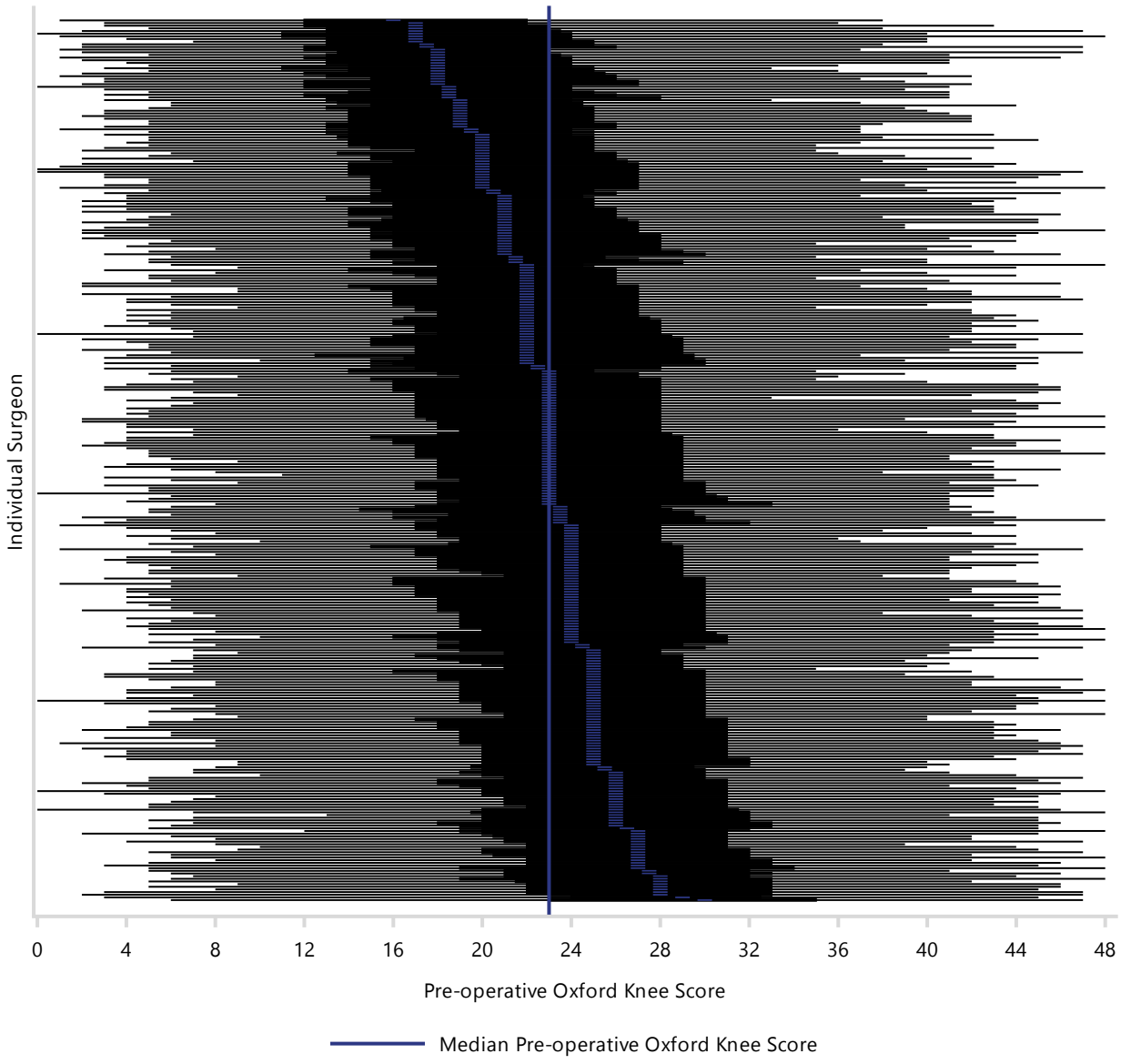


Note: Restricted to modern prostheses
Only hospitals with at least 50 procedures have been shown
The median pre-operative EQ-VAS Health is 75

Oxford Score

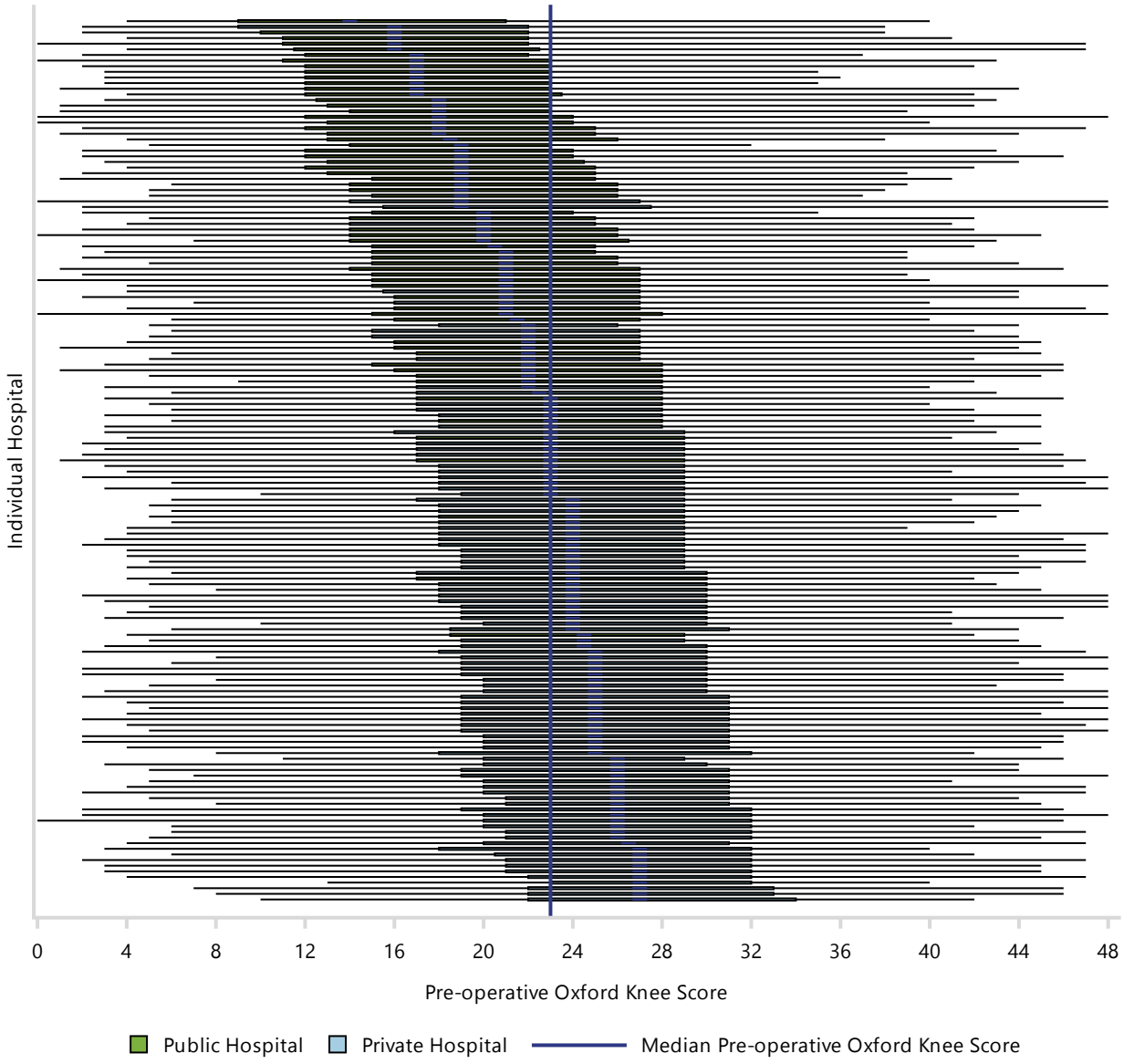
Comparisons of pre-operative Oxford Scores between hospitals and between surgeons for primary total knee replacement are shown in Figure SPR41 to Figure SPR42. Individual medians are shown as blue squares, compared to the group median represented by the vertical blue line. Like the EQ-VAS analysis, public 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 SPR41 and Figure SPR43).

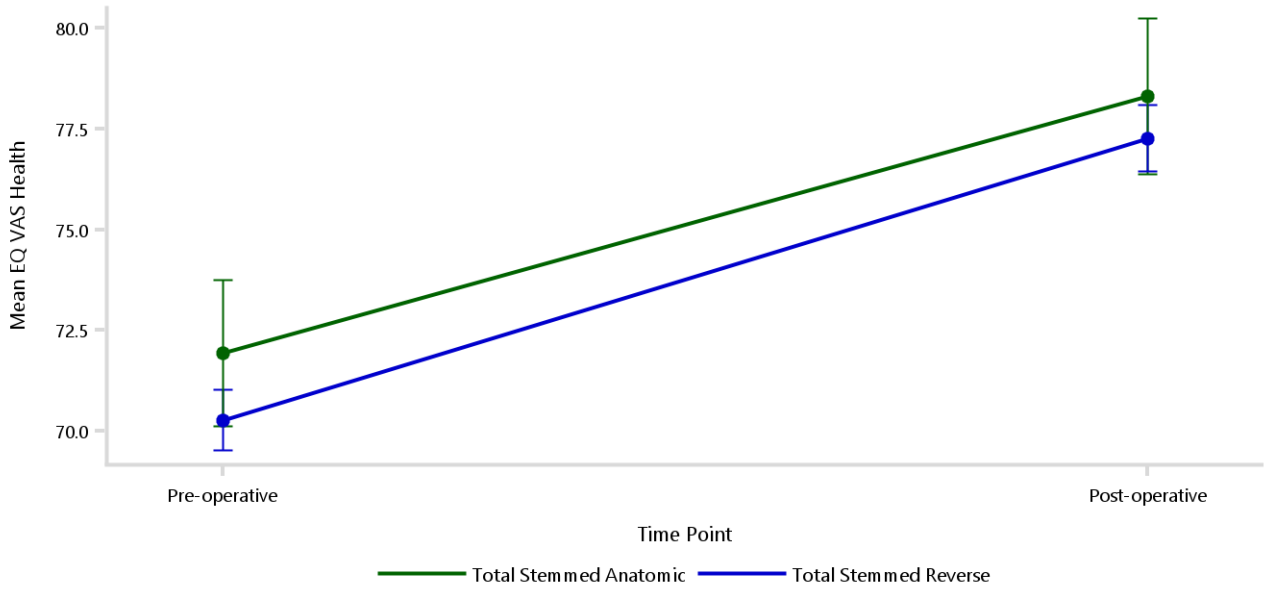
The percentage of total stemmed anatomic shoulder replacement patients who reported being better, worse or no different post-operatively compared to their pre-operative response for each of the EQ-5D domains and the EQ-VAS is shown in Figure SPR44. The corresponding percentages for patients who underwent 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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Total Stemmed Anatomic	387	71.93 (70.12, 73.74)	298	78.31 (76.37, 80.25)	6.39 (4.30, 8.47)
Total Stemmed Reverse	2181	70.26 (69.51, 71.02)	1596	77.27 (76.44, 78.10)	7.01 (6.11, 7.91)

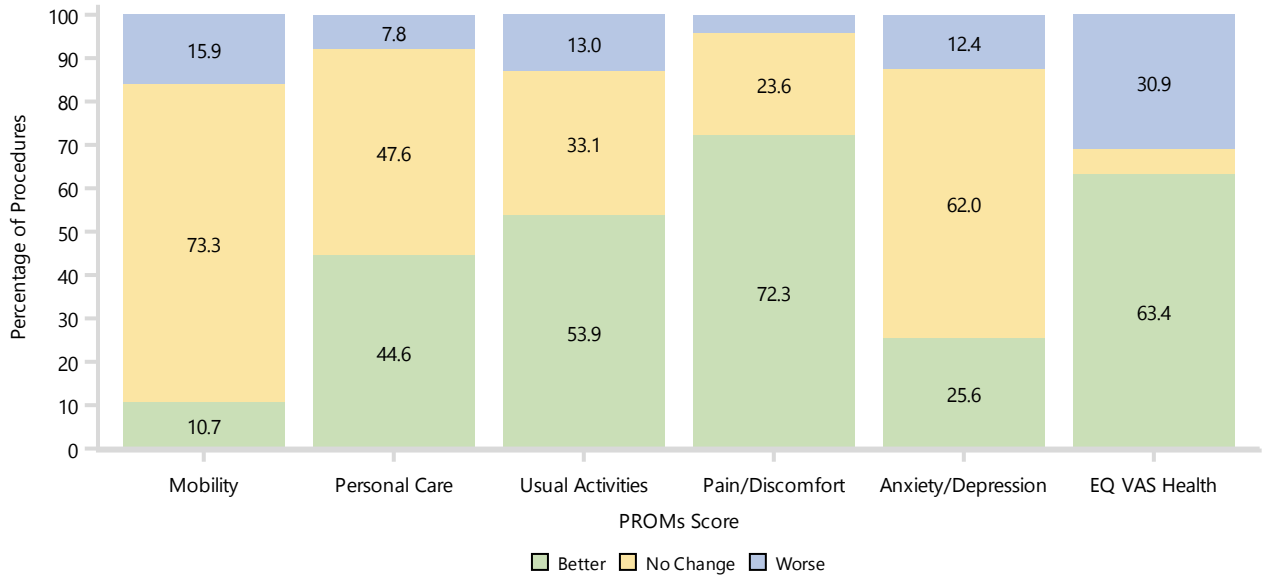
Note: Restricted to modern prostheses
Adjusted for age and gender

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 SPR42 and shown graphically in Figure SPR45. The mean preoperative Oxford scores were 24.1 and 23.6 for total stemmed anatomic and total stemmed reverse shoulder replacements, while the postoperative mean scores were 39.6 and 39.1 for these groups, respectively.

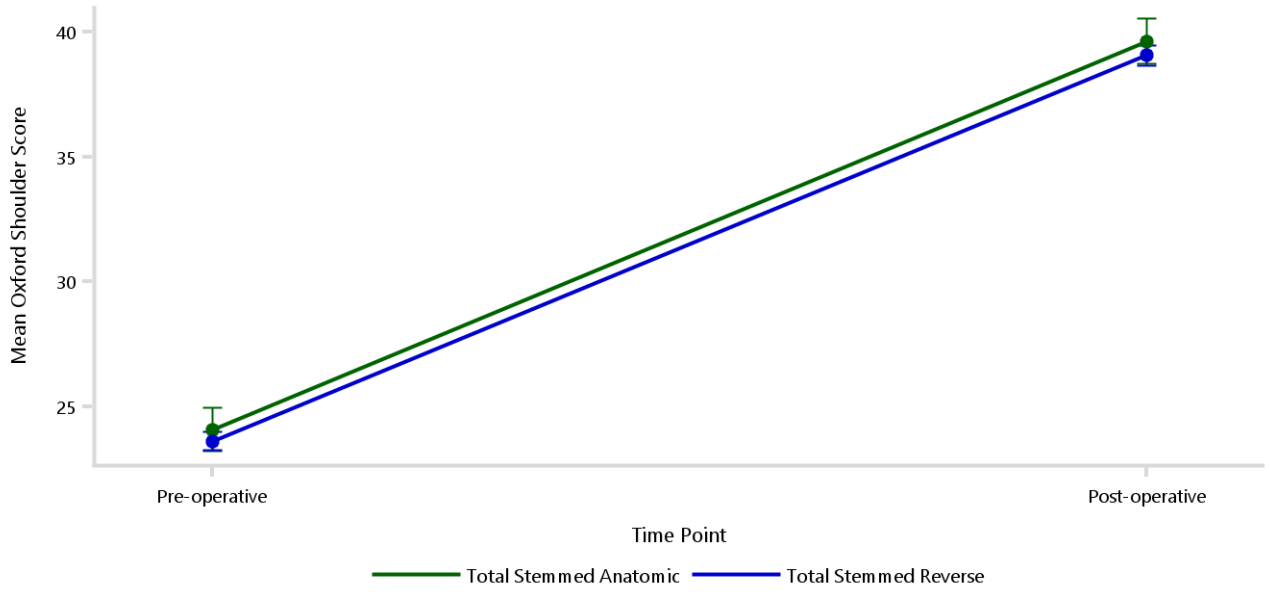
There is no difference in the pre- or post-operative score between shoulder classes, and the mean change in score is just over 15 points.

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Total Stemmed Anatomic	387	24.08 (23.21, 24.94)	297	39.63 (38.72, 40.54)	15.55 (14.50, 16.61)
Total Stemmed Reverse	2188	23.62 (23.26, 23.98)	1604	39.06 (38.67, 39.45)	15.44 (14.99, 15.89)

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, 90.5% of patients were either very satisfied or satisfied. After primary total stemmed reverse shoulder replacement, 88.3% of patients were either very satisfied or satisfied (Table SPR42 and Figure SPR46).

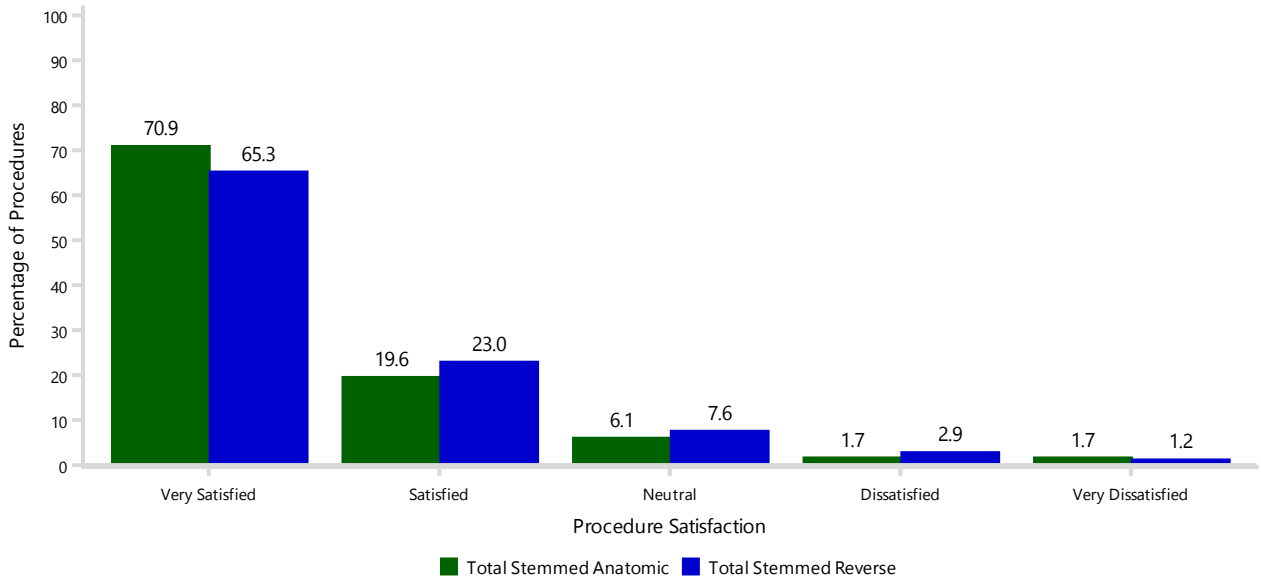
There was a high percentage (94.6%) of patients who rated their primary total stemmed anatomic shoulder replacement as much better or a little better. Similarly, patient-reported change after total stemmed reverse shoulder replacement was largely much better or a little better (93.3%) (Table SPR43 and 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	210	70.9	16.7	58	19.6	13.6	18	6.1	12.9	5	1.7	9.8	5	1.7	20.0	296	100.0	15.6
Total Stemmed Reverse	1045	65.3	83.3	368	23.0	86.4	122	7.6	87.1	46	2.9	90.2	20	1.2	80.0	1601	100.0	84.4
TOTAL	**1255**	**66.2**	**100.0**	**426**	**22.5**	**100.0**	**140**	**7.4**	**100.0**	**51**	**2.7**	**100.0**	**25**	**1.3**	**100.0**	**1897**	**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)



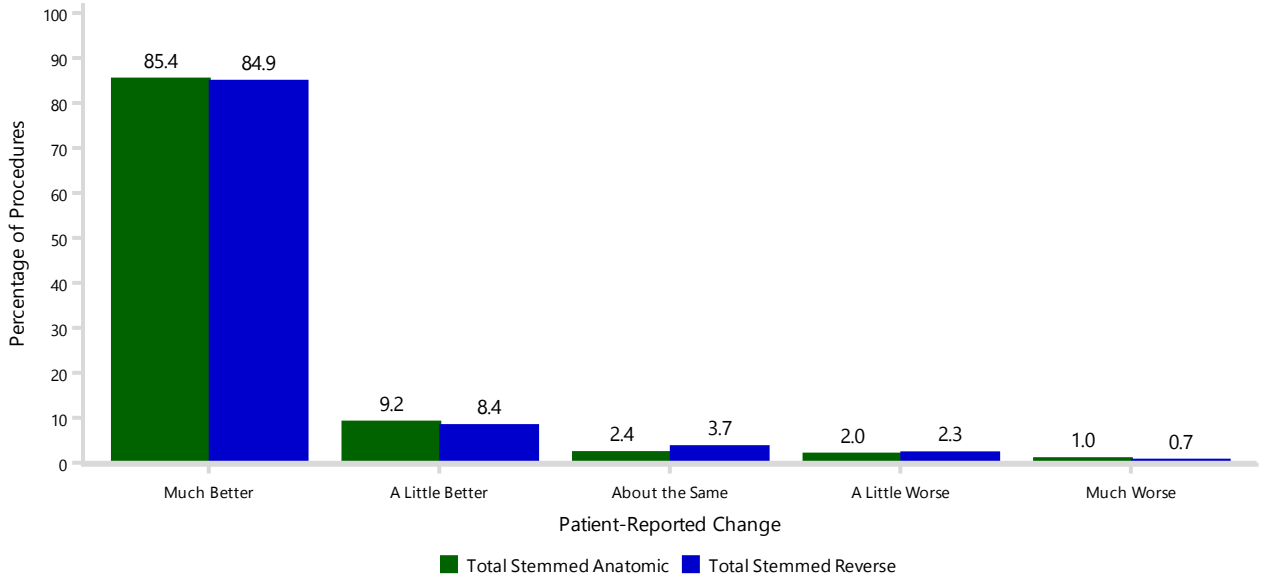
Note: Restricted to modern prostheses

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	252	85.4	15.6	27	9.2	16.8	7	2.4	10.6	6	2.0	14.0	3	1.0	21.4	295	100.0	15.6
Total Stemmed Reverse	1359	84.9	84.4	134	8.4	83.2	59	3.7	89.4	37	2.3	86.0	11	0.7	78.6	1600	100.0	84.4
TOTAL	**1611**	**85.0**	**100.0**	**161**	**8.5**	**100.0**	**66**	**3.5**	**100.0**	**43**	**2.3**	**100.0**	**14**	**0.7**	**100.0**	**1895**	**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).

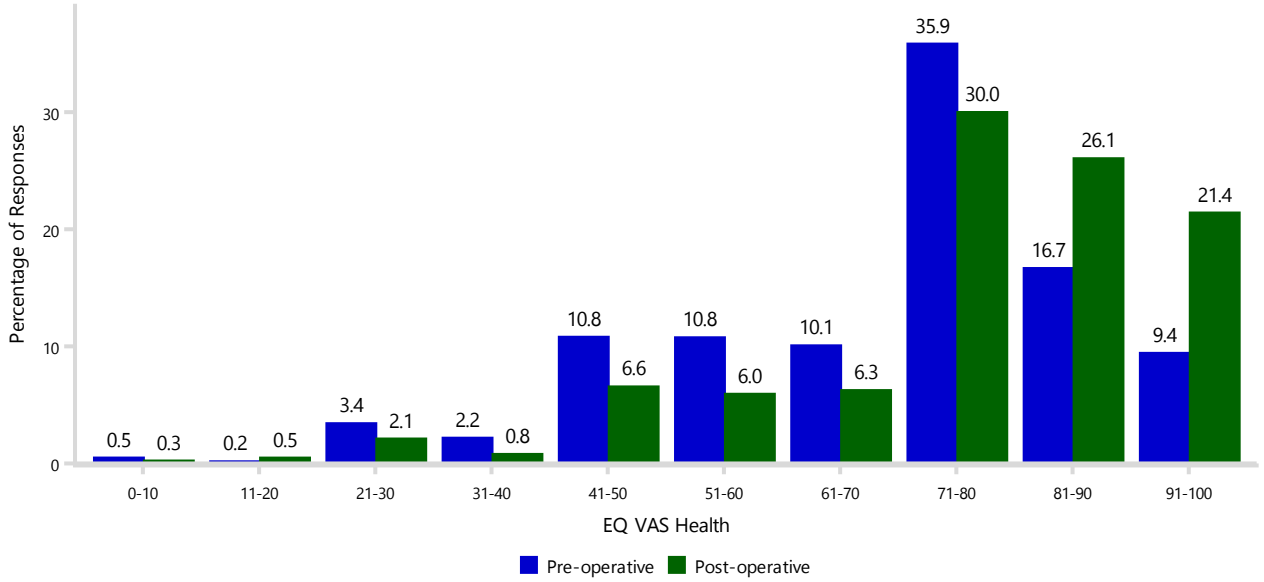
Glenoid morphology does not appear to impact the pre-operative mean EQ-VAS. The mean change in score is greatest for the B2 category (Table SPR49 and Figure SPR54).

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	2181	70.08(17.86)	75.00 (59.00, 82.00)	1596	77.42(17.32)	80.00 (73.00, 90.00)

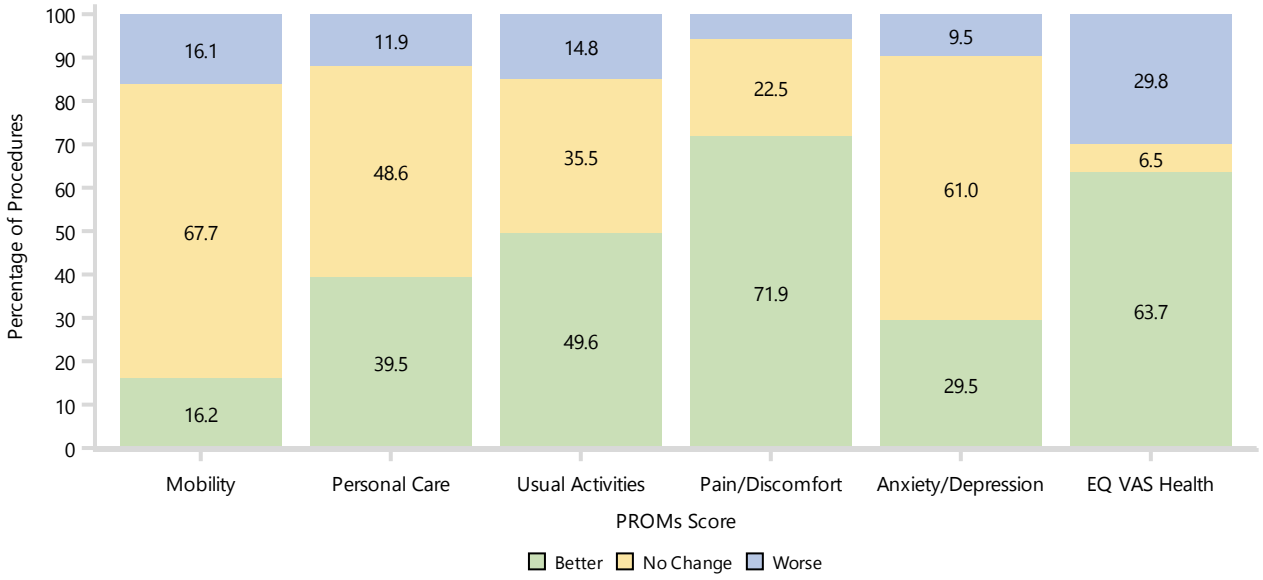
Note: Restricted to modern prostheses

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)



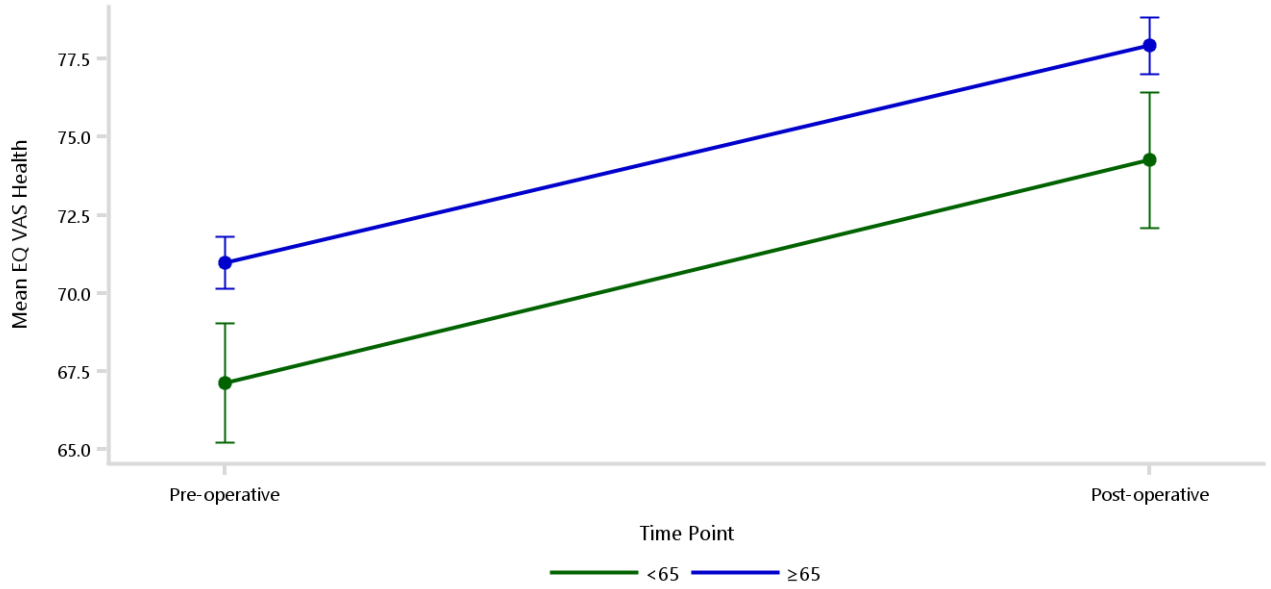
Note: Restricted to modern prostheses

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
<65	331	67.13 (65.23, 69.03)	228	74.26 (72.09, 76.43)	7.13 (4.80, 9.46)
≥65	1850	70.98 (70.16, 71.80)	1368	77.92 (77.02, 78.83)	6.94 (5.97, 7.91)

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)



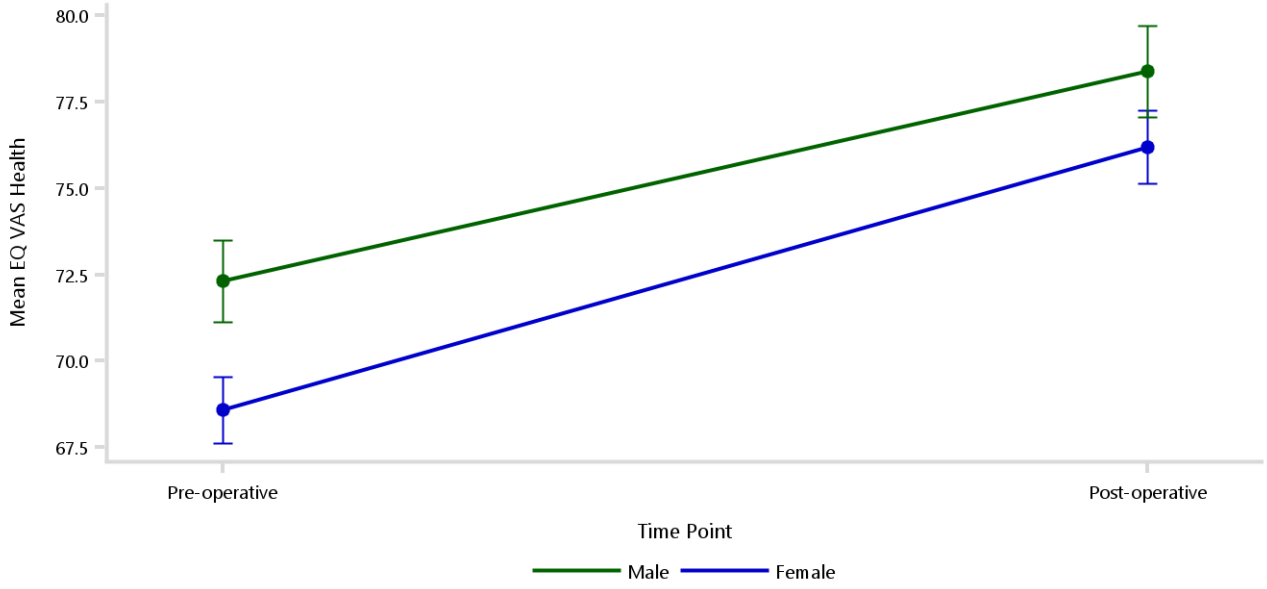
Note: Restricted to modern prostheses
Adjusted for gender

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Male	866	72.31 (71.13, 73.49)	627	78.38 (77.06, 79.70)	6.07 (4.65, 7.49)
Female	1315	68.59 (67.63, 69.55)	969	76.18 (75.12, 77.24)	7.59 (6.44, 8.74)

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)



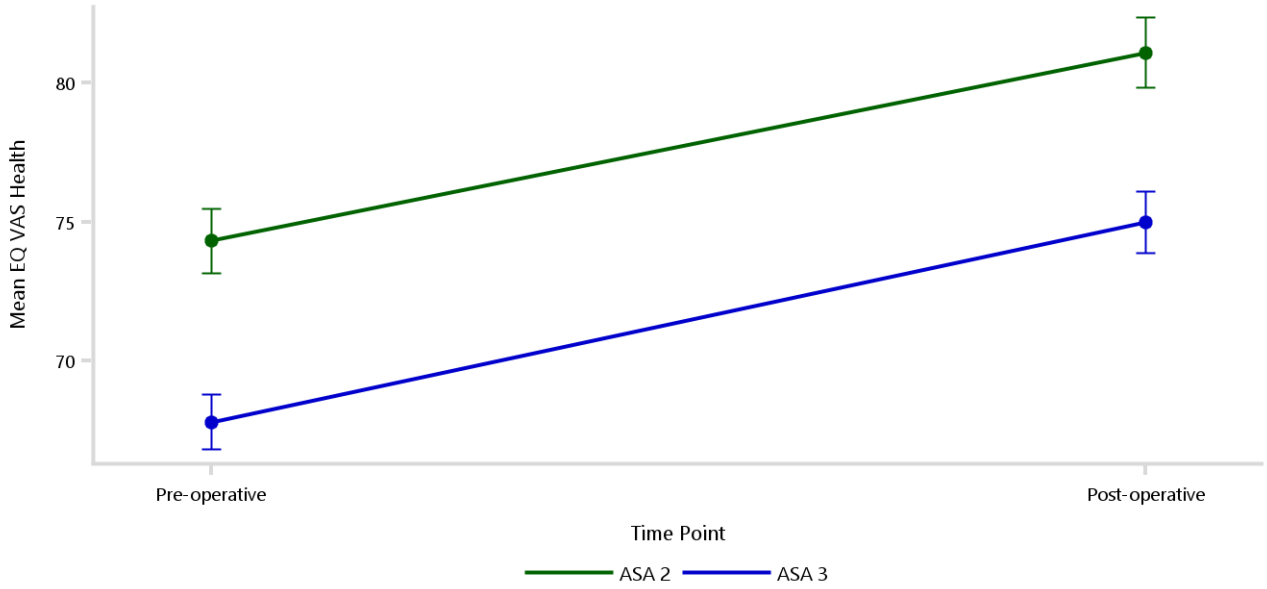
Note: Restricted to modern prostheses
Adjusted for age

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 2	870	74.32 (73.16, 75.49)	655	81.09 (79.82, 82.36)	6.77 (5.39, 8.15)
ASA 3	1220	67.81 (66.82, 68.79)	870	75.00 (73.90, 76.09)	7.19 (5.99, 8.39)

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)



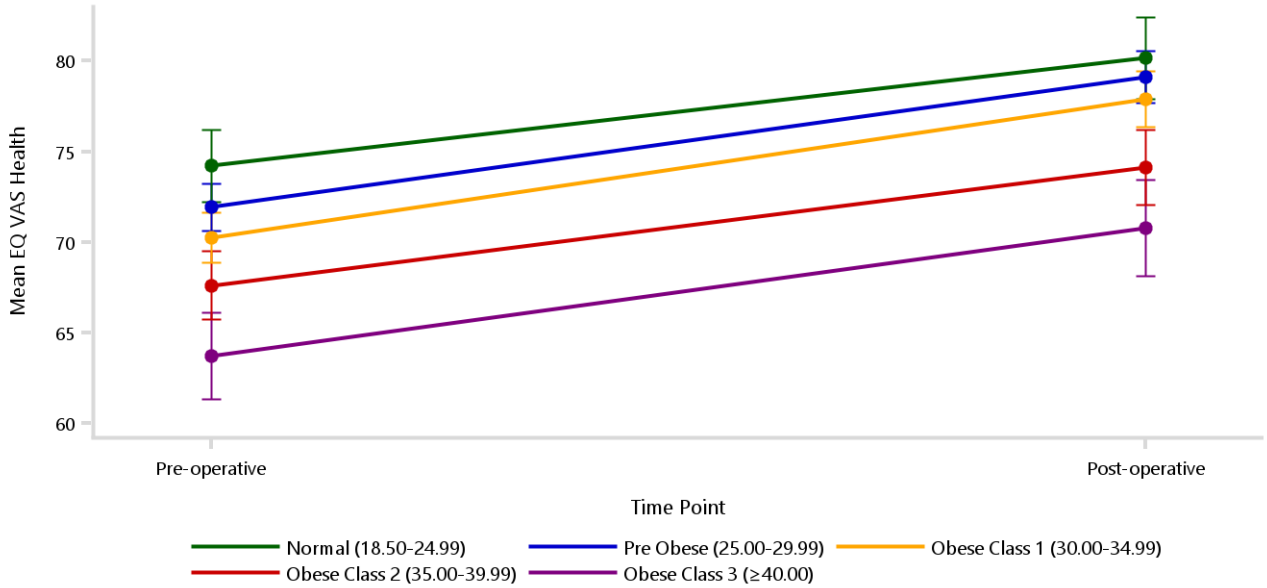
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Normal (18.50-24.99)	305	74.23 (72.24, 76.21)	211	80.15 (77.90, 82.41)	5.93 (3.49, 8.36)
Pre Obese (25.00-29.99)	693	71.93 (70.63, 73.23)	517	79.14 (77.70, 80.57)	7.21 (5.63, 8.78)
Obese Class 1 (30.00-34.99)	609	70.27 (68.87, 71.66)	448	77.91 (76.36, 79.45)	7.64 (5.95, 9.34)
Obese Class 2 (35.00-39.99)	332	67.62 (65.74, 69.50)	249	74.12 (72.05, 76.20)	6.50 (4.21, 8.80)
Obese Class 3 (≥40.00)	212	63.72 (61.32, 66.12)	157	70.77 (68.12, 73.42)	7.05 (4.21, 9.90)

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)



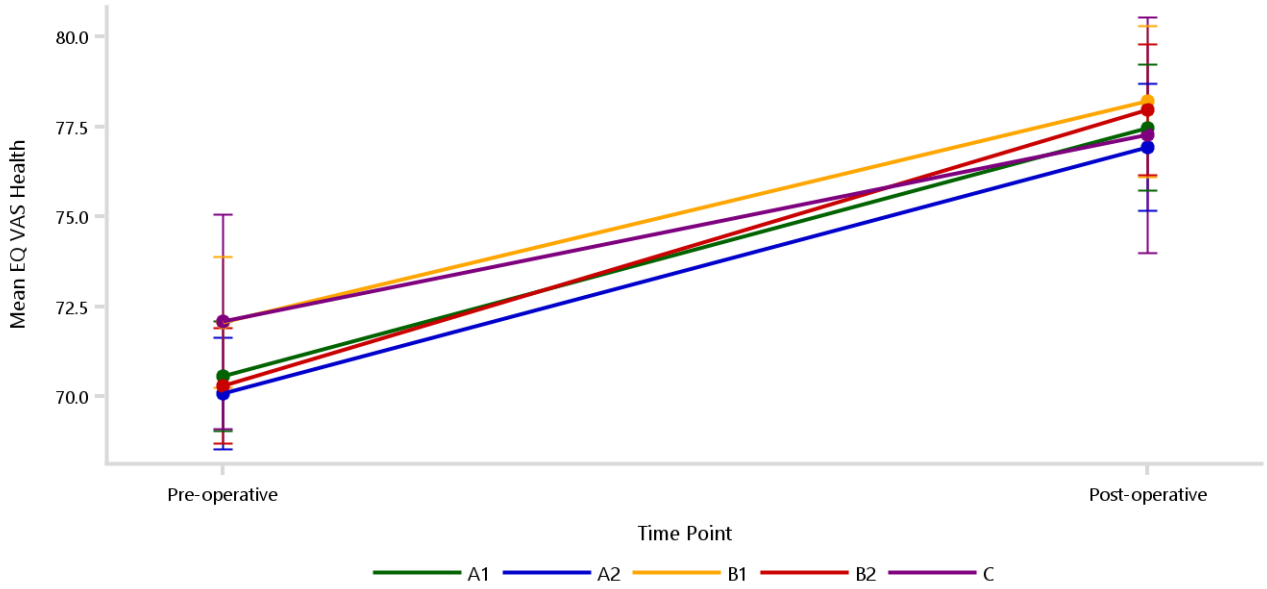
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
A1	513	70.55 (69.02, 72.09)	369	77.48 (75.73, 79.23)	6.93 (5.08, 8.77)
A2	485	70.08 (68.52, 71.64)	358	76.93 (75.16, 78.69)	6.85 (4.97, 8.72)
B1	355	72.06 (70.24, 73.89)	251	78.21 (76.12, 80.30)	6.15 (3.93, 8.37)
B2	453	70.29 (68.68, 71.89)	334	77.97 (76.16, 79.79)	7.69 (5.75, 9.63)
C	130	72.08 (69.10, 75.07)	103	77.27 (74.00, 80.55)	5.19 (1.62, 8.75)

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 SPR51.

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 SPR52, Figure SPR55, Table SPR53 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 the mean improvement after surgery is similar (Table SPR54 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 SPR55 and Figure SPR58).

The pre- and post-operative OSS is not affected by glenoid morphology (Table SPR56 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	2188	23.32(8.90)	24.00 (17.00, 30.00)	1604	38.92(7.97)	41.00 (35.00, 45.00)

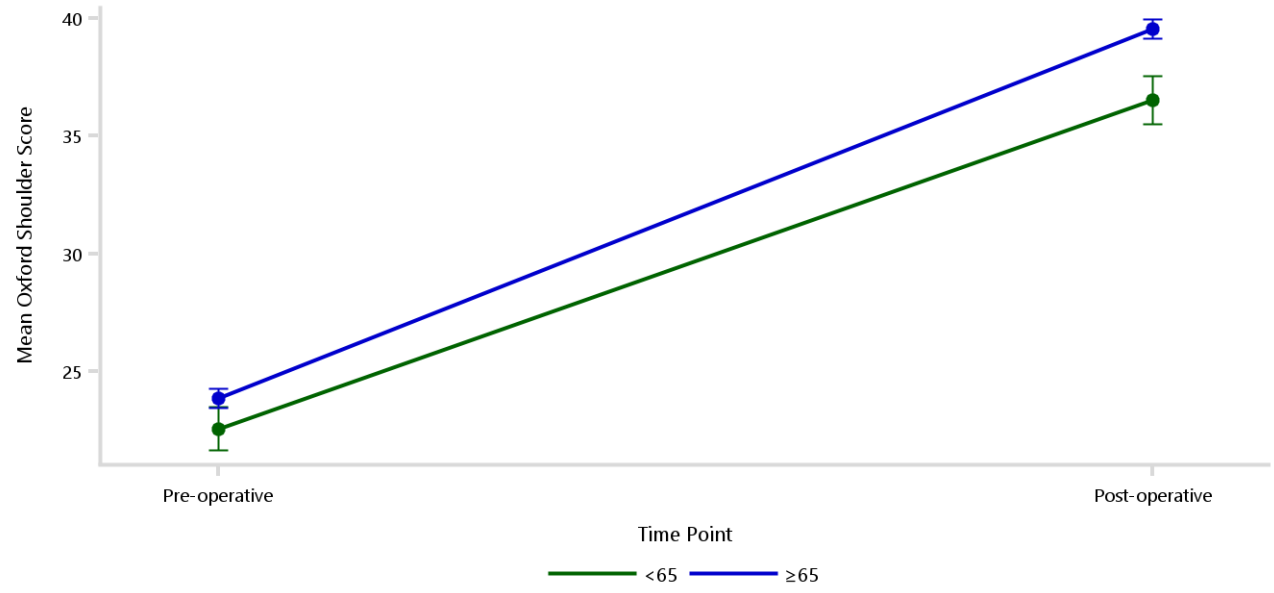
Note: Restricted to modern prostheses

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
<65	332	22.57 (21.65, 23.49)	228	36.53 (35.53, 37.54)	13.96 (12.79, 15.14)
≥65	1856	23.87 (23.47, 24.26)	1376	39.54 (39.12, 39.96)	15.68 (15.19, 16.16)

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)



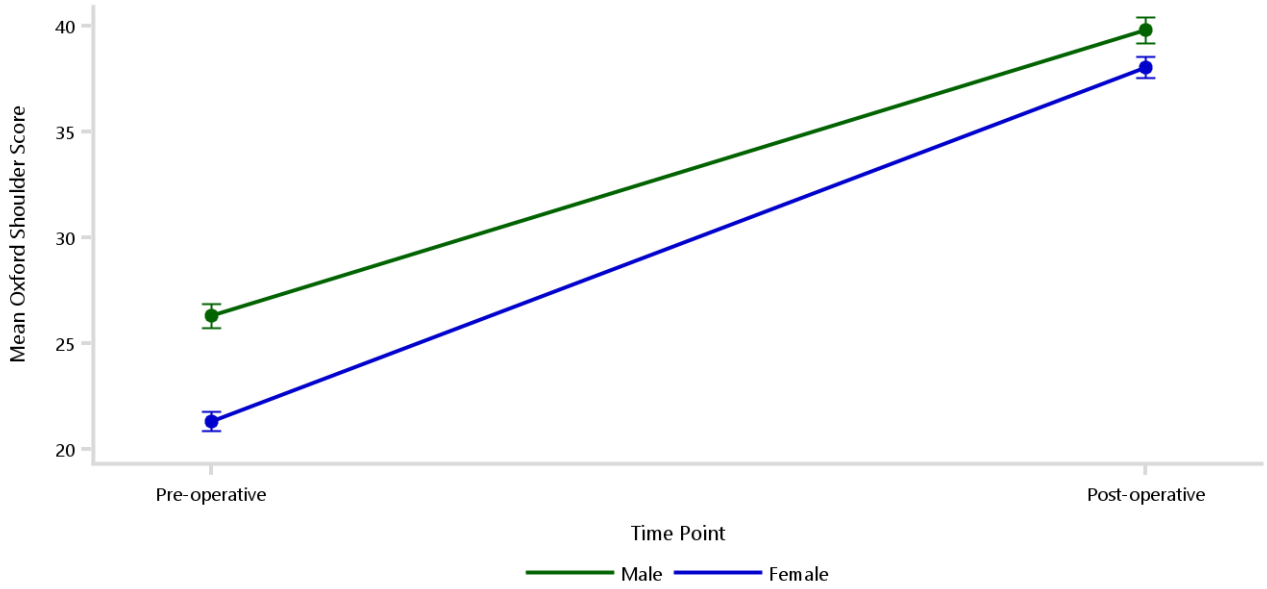
Note: Restricted to modern prostheses
Adjusted for gender

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Male	871	26.30 (25.73, 26.87)	630	39.79 (39.18, 40.40)	13.48 (12.78, 14.19)
Female	1317	21.31 (20.85, 21.78)	974	38.03 (37.54, 38.52)	16.71 (16.14, 17.29)

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)



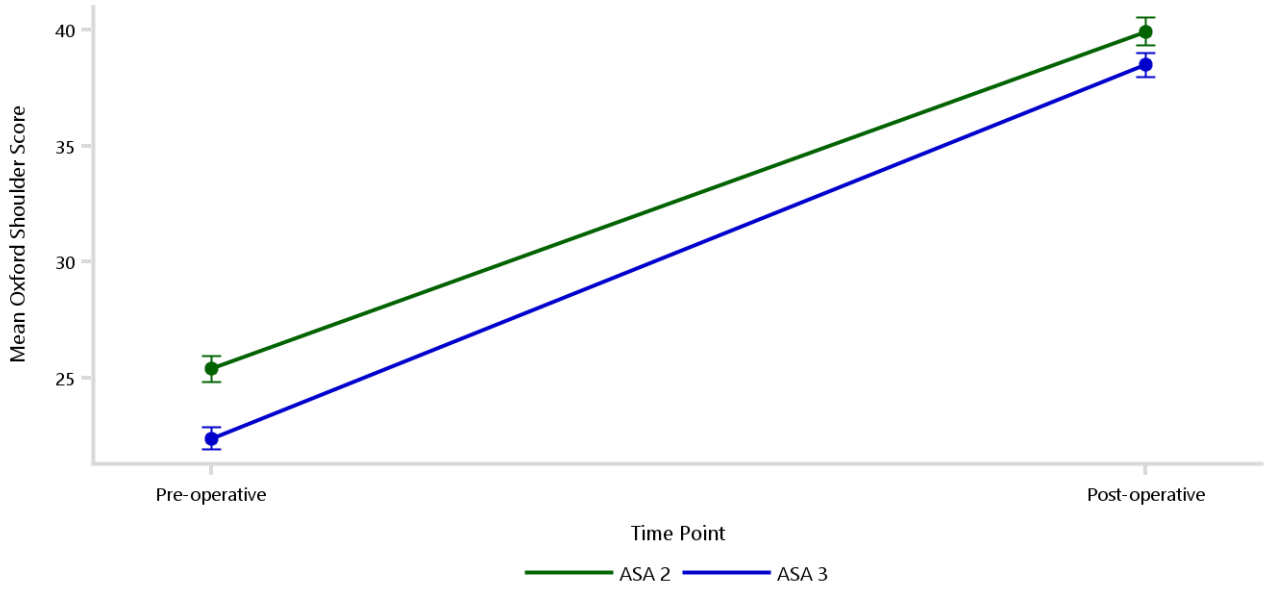
Note: Restricted to modern prostheses
Adjusted for age

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 2	873	25.41 (24.85, 25.98)	655	39.92 (39.31, 40.53)	14.51 (13.80, 15.21)
ASA 3	1226	22.42 (21.94, 22.90)	878	38.49 (37.96, 39.01)	16.07 (15.46, 16.67)

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)



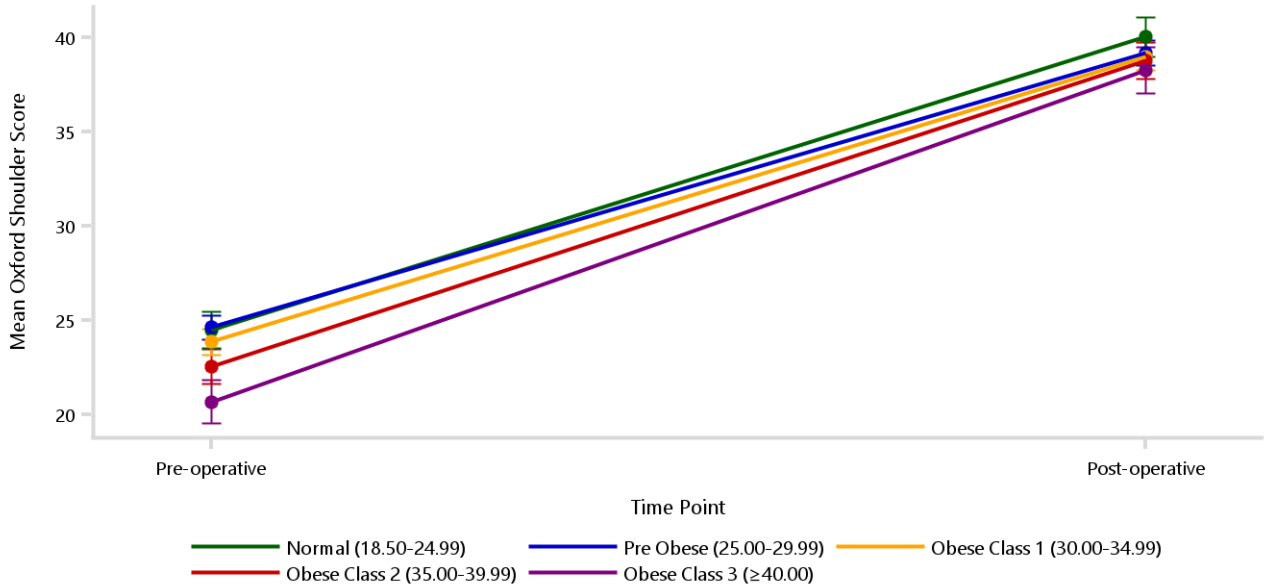
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Normal (18.50-24.99)	309	24.48 (23.52, 25.44)	217	40.03 (38.99, 41.08)	15.55 (14.34, 16.76)
Pre Obese (25.00-29.99)	690	24.63 (23.99, 25.26)	515	39.19 (38.52, 39.87)	14.57 (13.77, 15.36)
Obese Class 1 (30.00-34.99)	615	23.84 (23.17, 24.52)	450	39.00 (38.28, 39.73)	15.16 (14.31, 16.01)
Obese Class 2 (35.00-39.99)	331	22.55 (21.63, 23.47)	250	38.78 (37.81, 39.75)	16.23 (15.08, 17.38)
Obese Class 3 (≥40.00)	213	20.67 (19.51, 21.84)	159	38.26 (37.03, 39.50)	17.59 (16.16, 19.02)

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)



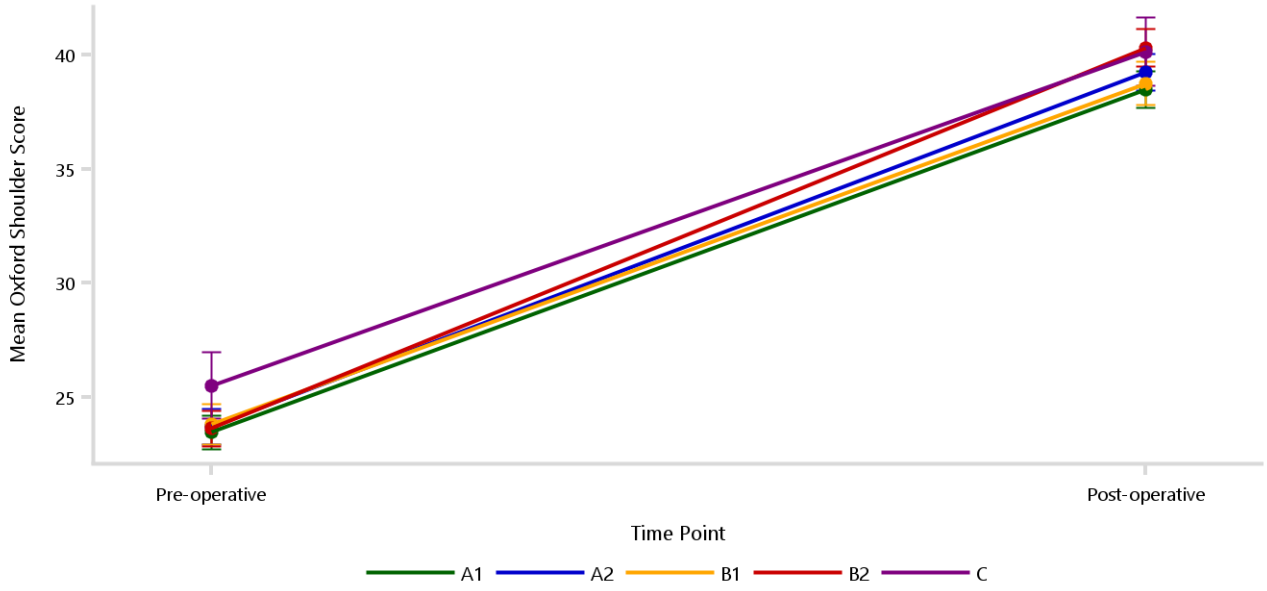
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
A1	516	23.47 (22.72, 24.21)	372	38.50 (37.70, 39.29)	15.03 (14.11, 15.96)
A2	479	23.73 (22.96, 24.50)	362	39.24 (38.44, 40.03)	15.51 (14.56, 16.45)
B1	356	23.83 (22.94, 24.73)	251	38.76 (37.81, 39.72)	14.93 (13.81, 16.05)
B2	460	23.65 (22.87, 24.43)	337	40.31 (39.49, 41.13)	16.66 (15.69, 17.63)
C	132	25.53 (24.06, 26.99)	101	40.15 (38.65, 41.65)	14.62 (12.83, 16.42)

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, 88.3 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 93.3% 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	1045	65.3	368	23.0	122	7.6	46	2.9	20	1.2	1601	100.0

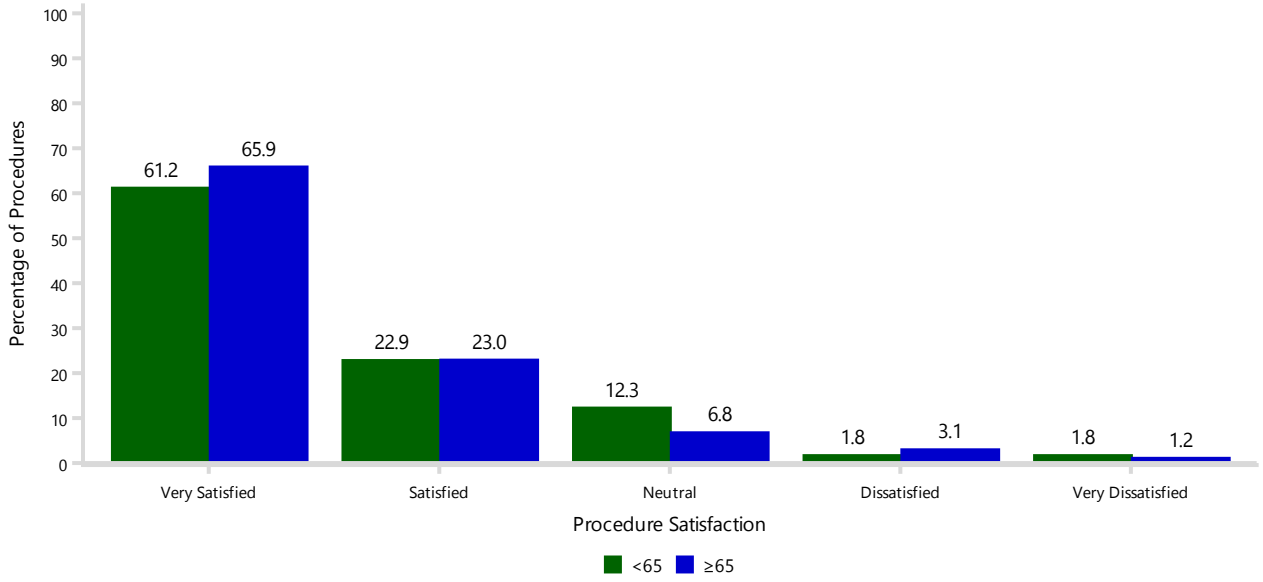
Note: Restricted to modern prostheses

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	139	61.2	13.3	52	22.9	14.1	28	12.3	23.0	4	1.8	8.7	4	1.8	20.0	227	100.0	14.2
≥65	906	65.9	86.7	316	23.0	85.9	94	6.8	77.0	42	3.1	91.3	16	1.2	80.0	1374	100.0	85.8
TOTAL	**1045**	**65.3**	**100.0**	**368**	**23.0**	**100.0**	**122**	**7.6**	**100.0**	**46**	**2.9**	**100.0**	**20**	**1.2**	**100.0**	**1601**	**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)



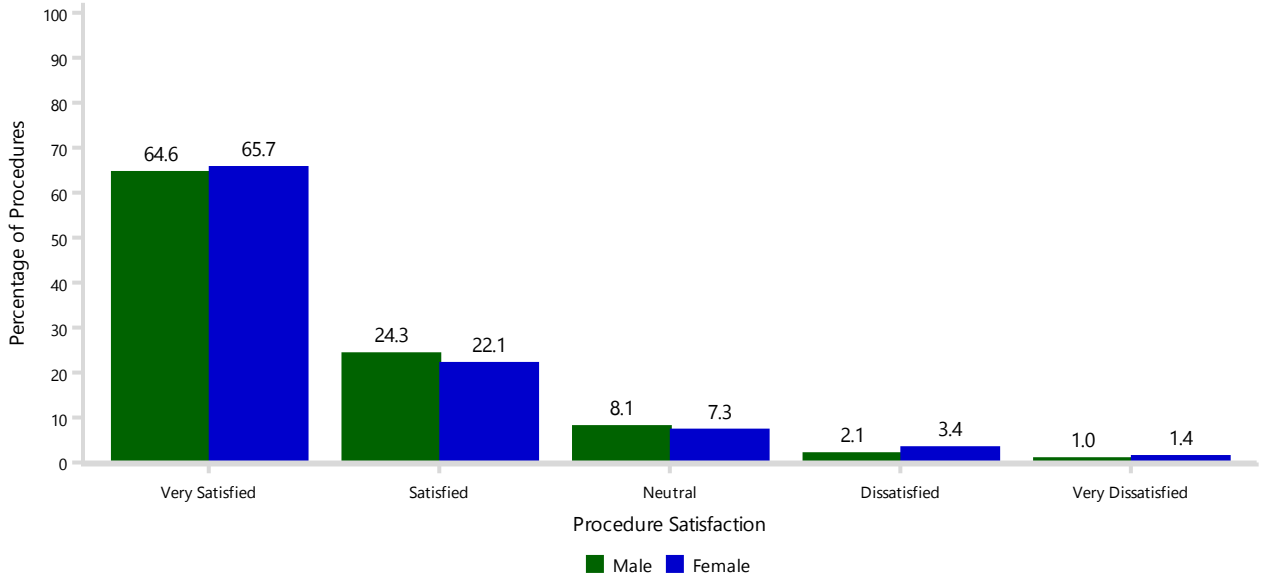
Note: Restricted to modern prostheses

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	407	64.6	38.9	153	24.3	41.6	51	8.1	41.8	13	2.1	28.3	6	1.0	30.0	630	100.0	39.4
Female	638	65.7	61.1	215	22.1	58.4	71	7.3	58.2	33	3.4	71.7	14	1.4	70.0	971	100.0	60.6
TOTAL	**1045**	**65.3**	**100.0**	**368**	**23.0**	**100.0**	**122**	**7.6**	**100.0**	**46**	**2.9**	**100.0**	**20**	**1.2**	**100.0**	**1601**	**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)



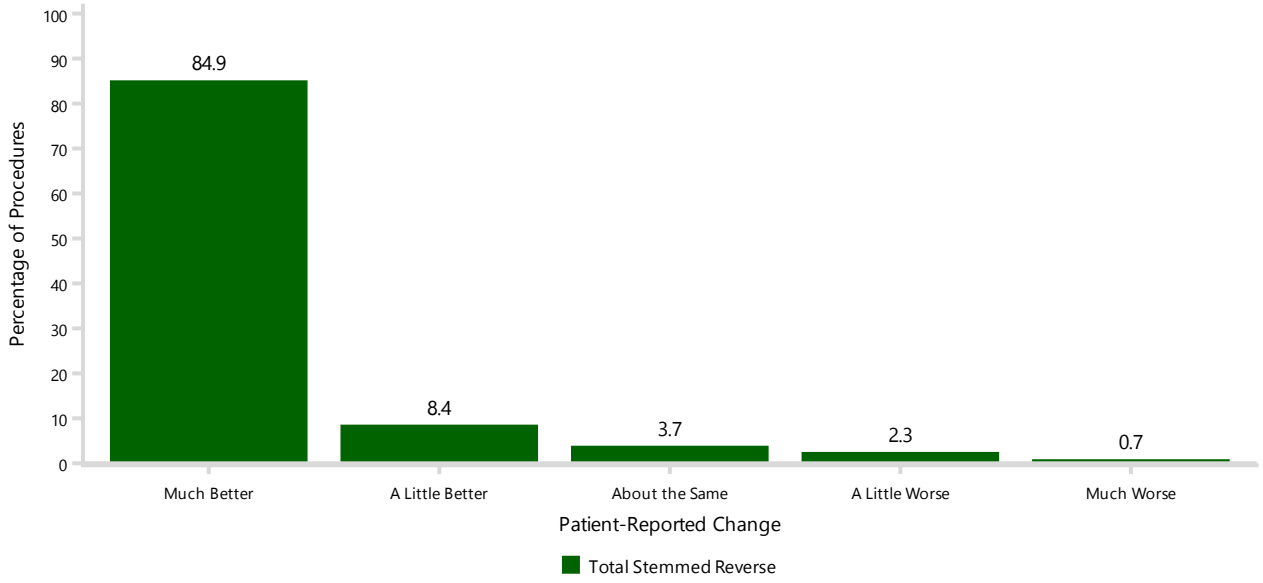
Note: Restricted to modern prostheses

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	1359	84.9	134	8.4	59	3.7	37	2.3	11	0.7	1600	100.0

Note: Restricted to modern prostheses

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



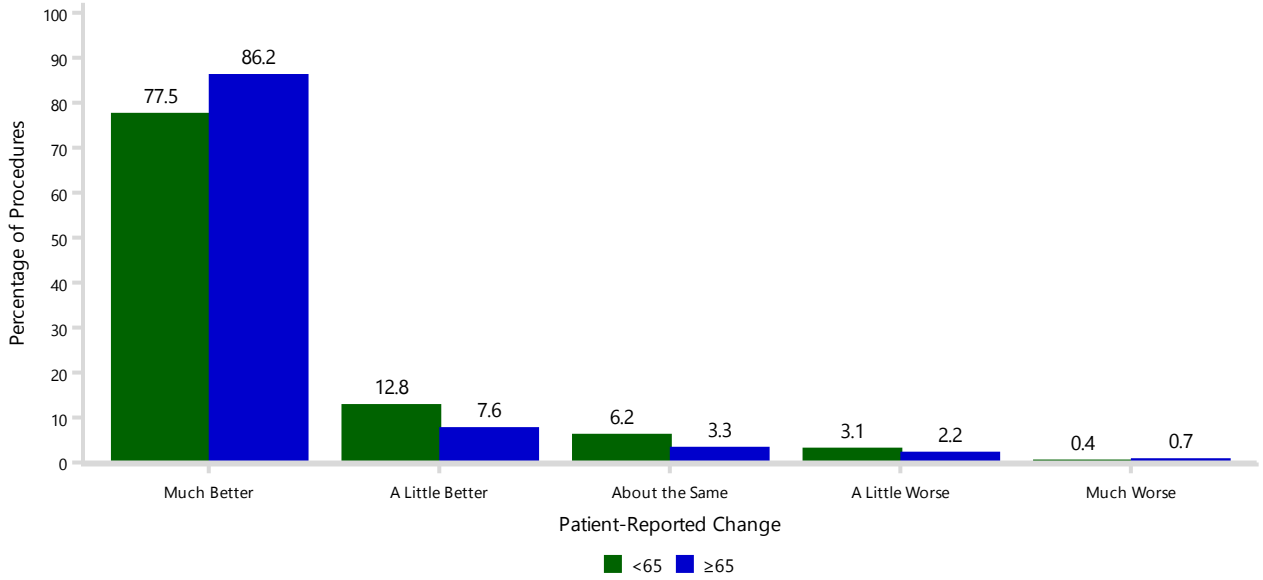
Note: Restricted to modern prostheses

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

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	176	77.5	13.0	29	12.8	21.6	14	6.2	23.7	7	3.1	18.9	1	0.4	9.1	227	100.0	14.2
≥65	1183	86.2	87.0	105	7.6	78.4	45	3.3	76.3	30	2.2	81.1	10	0.7	90.9	1373	100.0	85.8
TOTAL	**1359**	**84.9**	**100.0**	**134**	**8.4**	**100.0**	**59**	**3.7**	**100.0**	**37**	**2.3**	**100.0**	**11**	**0.7**	**100.0**	**1600**	**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)



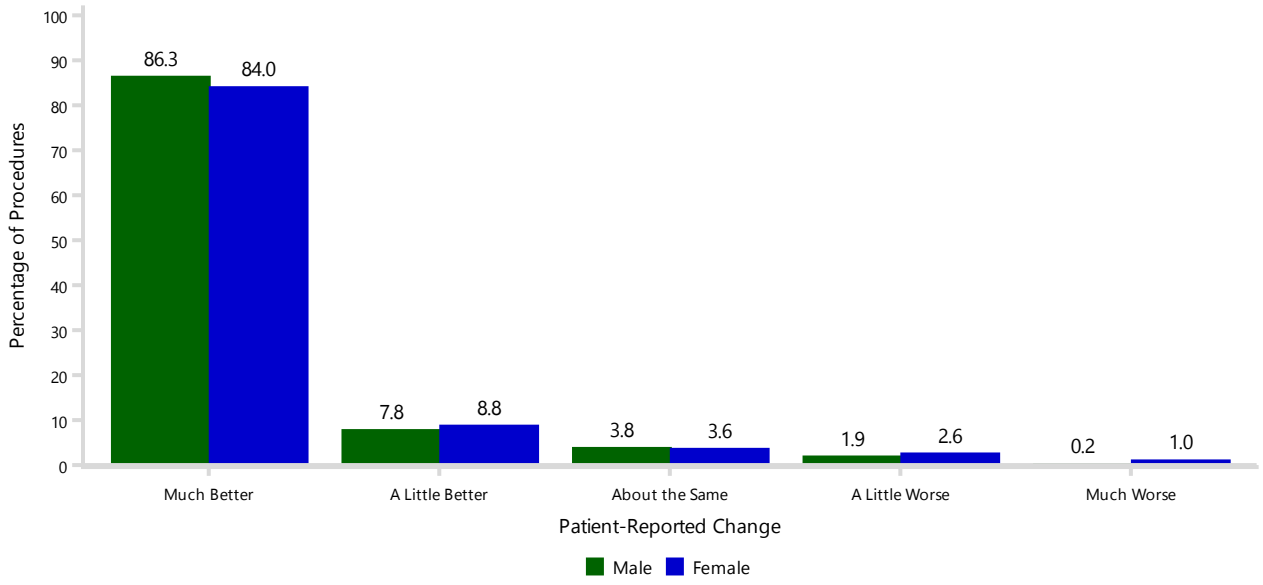
Note: Restricted to modern prostheses

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	544	86.3	40.0	49	7.8	36.6	24	3.8	40.7	12	1.9	32.4	1	0.2	9.1	630	100.0	39.4
Female	815	84.0	60.0	85	8.8	63.4	35	3.6	59.3	25	2.6	67.6	10	1.0	90.9	970	100.0	60.6
TOTAL	**1359**	**84.9**	**100.0**	**134**	**8.4**	**100.0**	**59**	**3.7**	**100.0**	**37**	**2.3**	**100.0**	**11**	**0.7**	**100.0**	**1600**	**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).

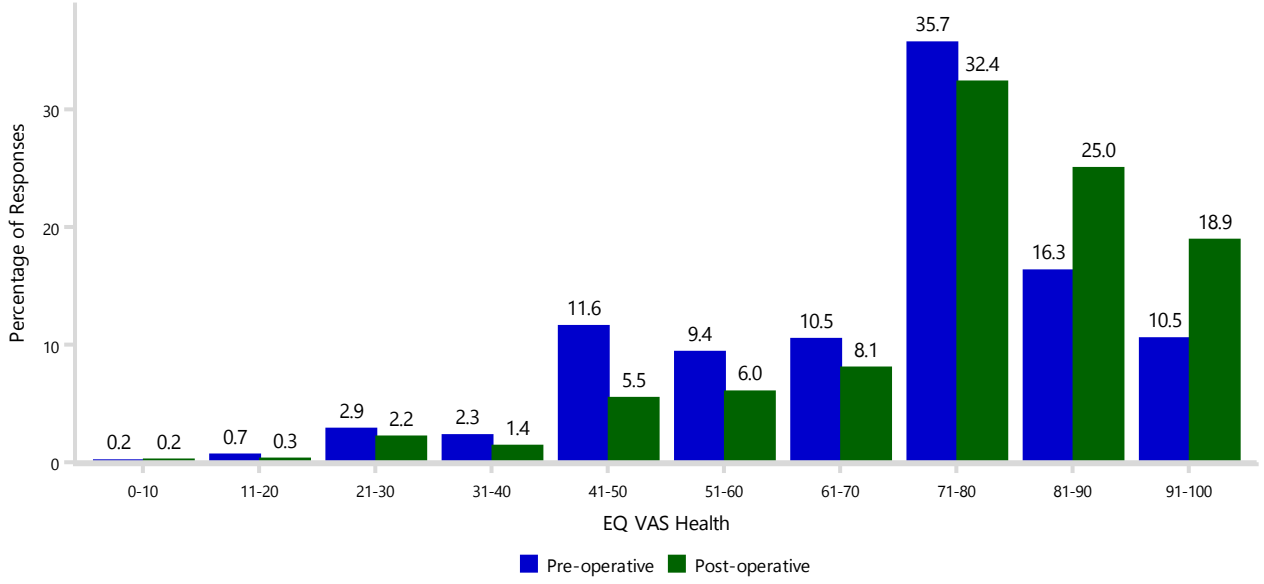
Glenoid morphology does not impact on pre- or post-operative EQ-VAS (Table SPR67 and Figure SPR71).

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	1821	70.56(17.73)	75.00 (59.00, 83.00)	1279	76.71(16.89)	78.00 (72.00, 89.00)

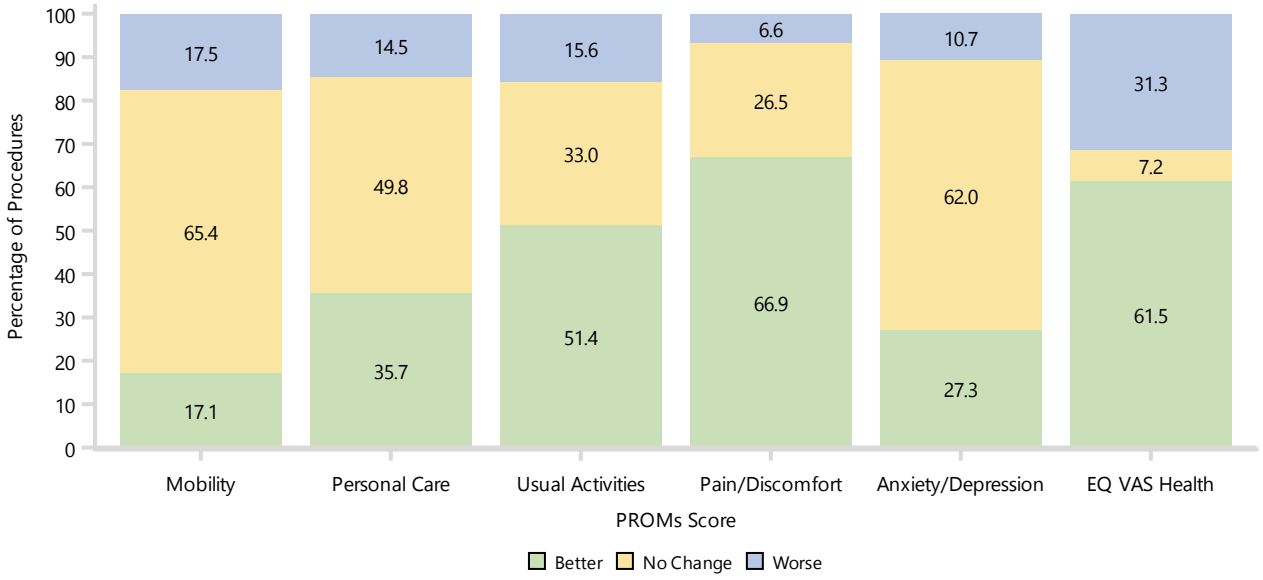
Note: Restricted to modern prostheses

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)



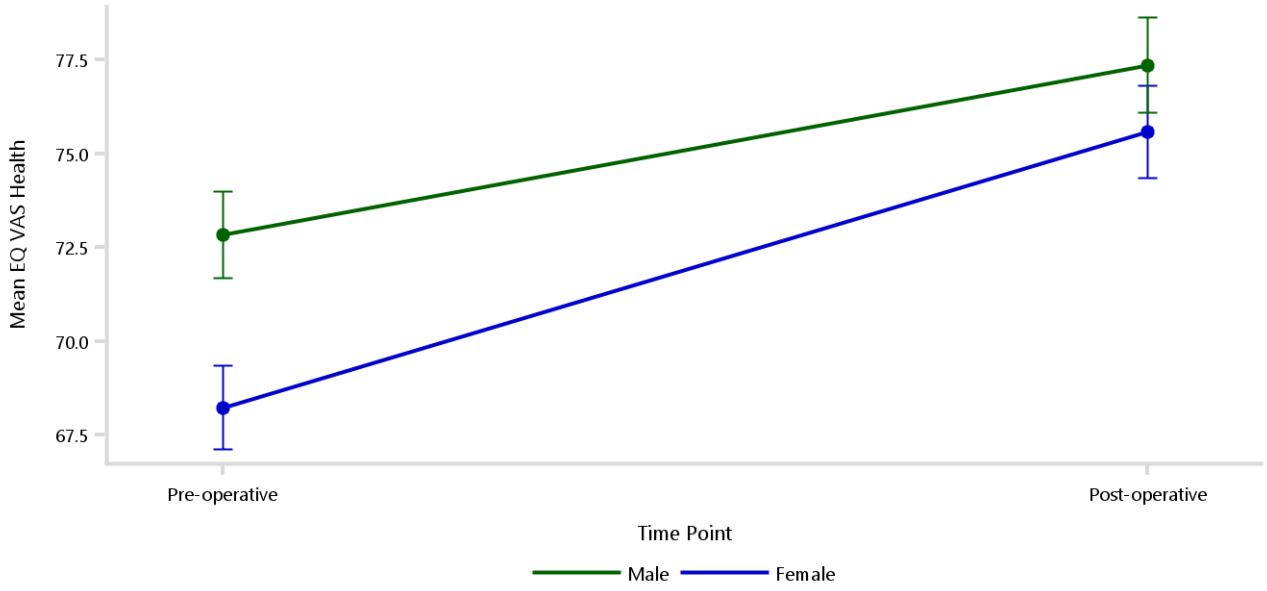
Note: Restricted to modern prostheses

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Male	882	72.85 (71.70, 74.00)	620	77.36 (76.08, 78.63)	4.51 (3.14, 5.87)
Female	939	68.24 (67.12, 69.36)	659	75.58 (74.35, 76.82)	7.35 (6.03, 8.67)

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)



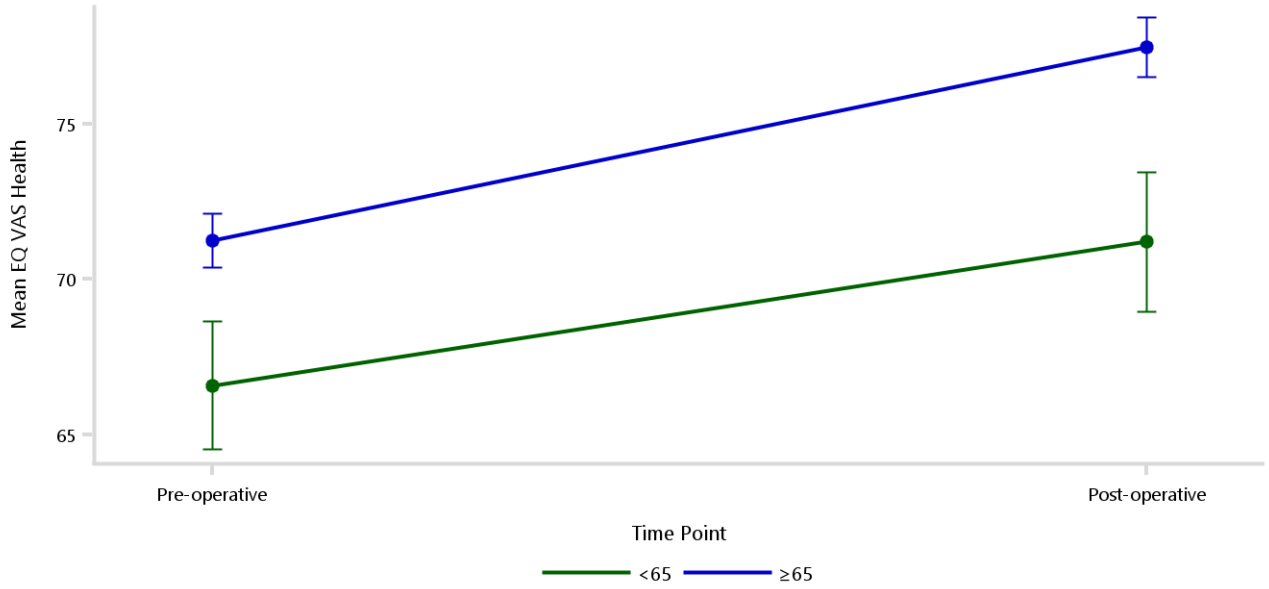
Note: Restricted to modern prostheses
Adjusted for age

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
<65	276	66.58 (64.53, 68.64)	199	71.20 (68.95, 73.46)	4.62 (2.21, 7.03)
≥65	1545	71.25 (70.38, 72.12)	1080	77.47 (76.51, 78.43)	6.22 (5.18, 7.25)

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)



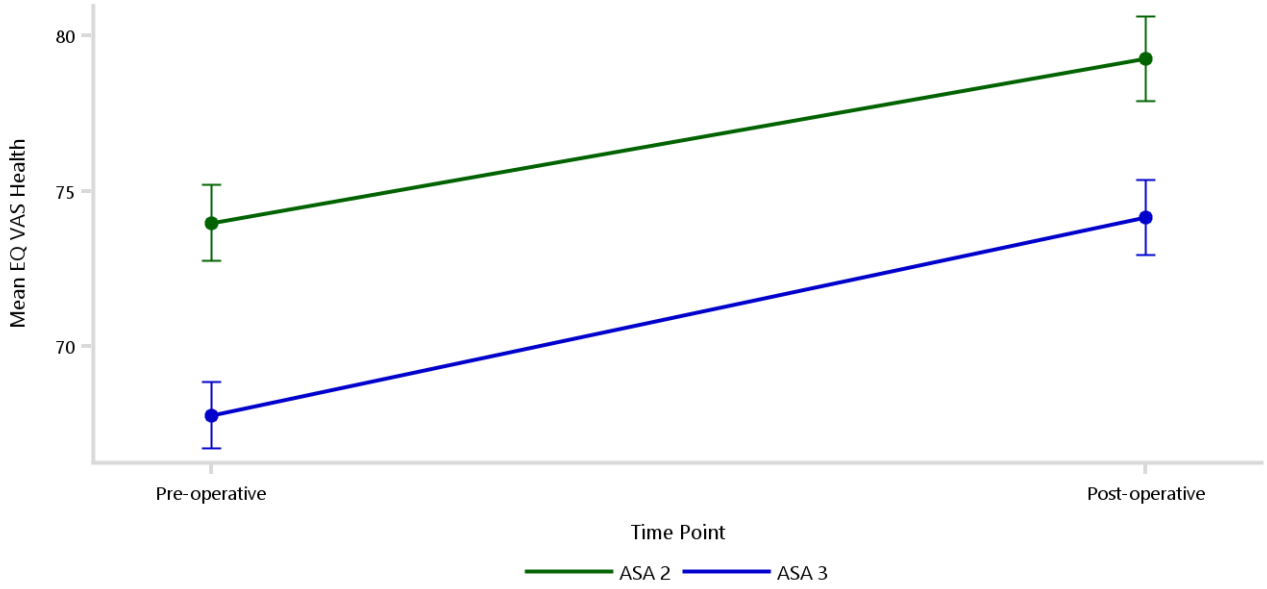
Note: Restricted to modern prostheses
Adjusted for gender

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 2	752	73.98 (72.76, 75.21)	529	79.26 (77.89, 80.63)	5.28 (3.81, 6.74)
ASA 3	976	67.80 (66.73, 68.87)	676	74.17 (72.97, 75.38)	6.37 (5.08, 7.67)

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)



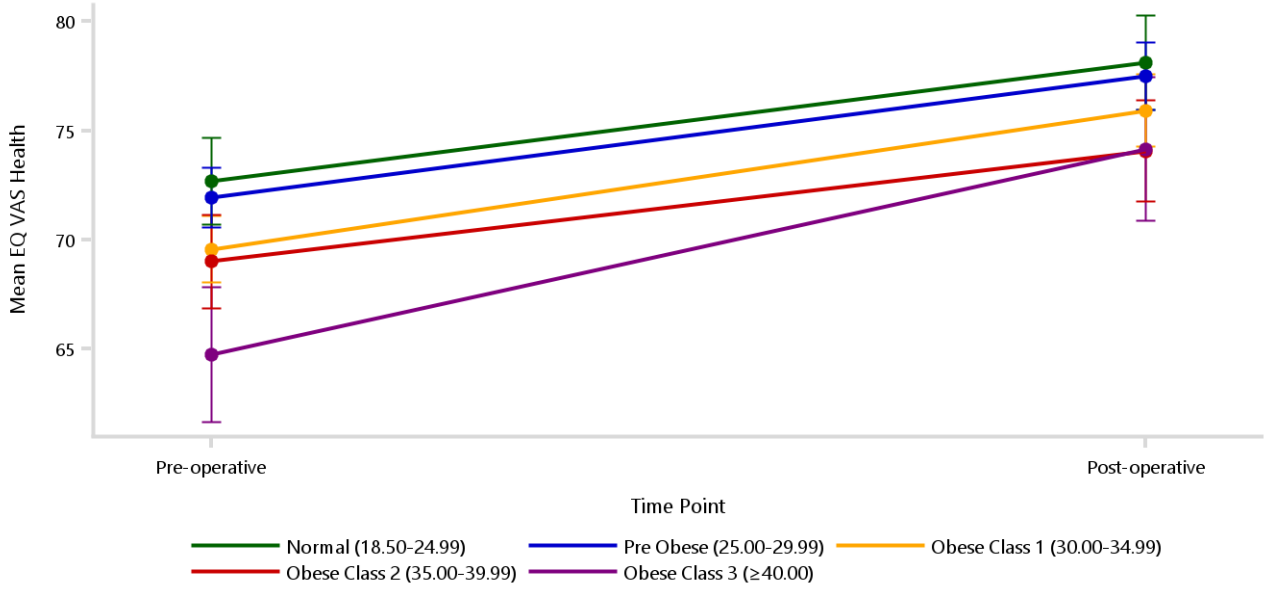
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Normal (18.50-24.99)	299	72.69 (70.72, 74.67)	212	78.11 (75.95, 80.28)	5.42 (3.09, 7.74)
Pre Obese (25.00-29.99)	622	71.95 (70.58, 73.32)	411	77.49 (75.94, 79.04)	5.53 (3.87, 7.19)
Obese Class 1 (30.00-34.99)	497	69.56 (68.03, 71.08)	356	75.92 (74.26, 77.59)	6.37 (4.56, 8.17)
Obese Class 2 (35.00-39.99)	252	69.00 (66.85, 71.16)	188	74.07 (71.76, 76.39)	5.07 (2.60, 7.54)
Obese Class 3 (≥40.00)	123	64.74 (61.64, 67.84)	94	74.16 (70.86, 77.46)	9.42 (5.89, 12.94)

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)



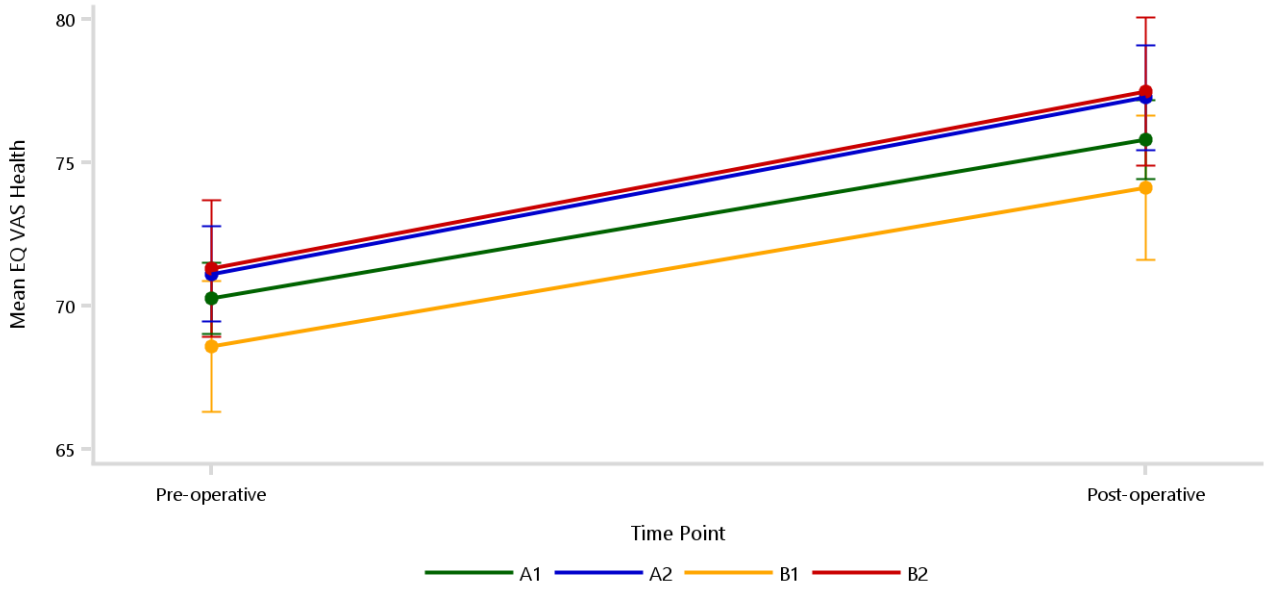
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
A1	766	70.28 (69.04, 71.52)	540	75.82 (74.44, 77.20)	5.54 (4.08, 7.01)
A2	427	71.12 (69.46, 72.78)	303	77.29 (75.46, 79.12)	6.17 (4.20, 8.14)
B1	227	68.60 (66.32, 70.88)	160	74.15 (71.62, 76.67)	5.54 (2.86, 8.23)
B2	206	71.32 (68.92, 73.71)	154	77.50 (74.91, 80.08)	6.18 (3.43, 8.92)

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	1813	23.83(8.94)	24.00 (18.00, 30.00)	1277	37.43(8.71)	40.00 (33.00, 44.00)
TOTAL	**1813**	**23.83(8.94)**	**24.00 (18.00, 30.00)**	**1277**	**37.43(8.71)**	**40.00 (33.00, 44.00)**

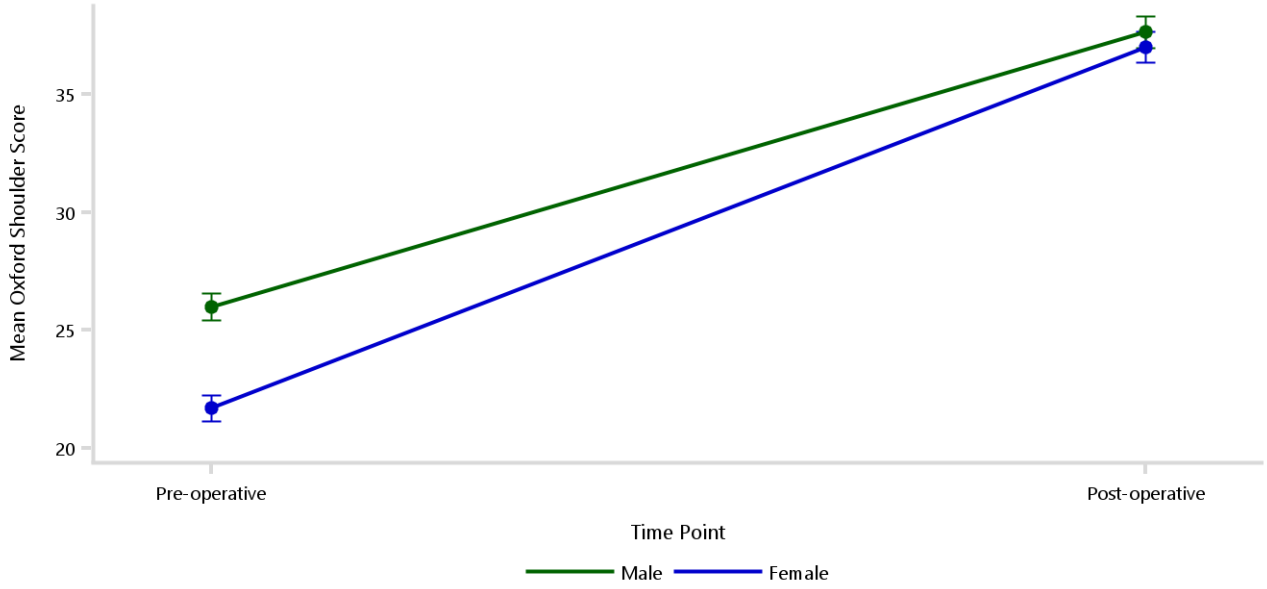
Note: Restricted to modern prostheses

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Male	876	26.01 (25.43, 26.59)	618	37.63 (36.96, 38.30)	11.62 (10.88, 12.36)
Female	937	21.71 (21.15, 22.27)	659	36.98 (36.34, 37.63)	15.27 (14.55, 15.99)

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)



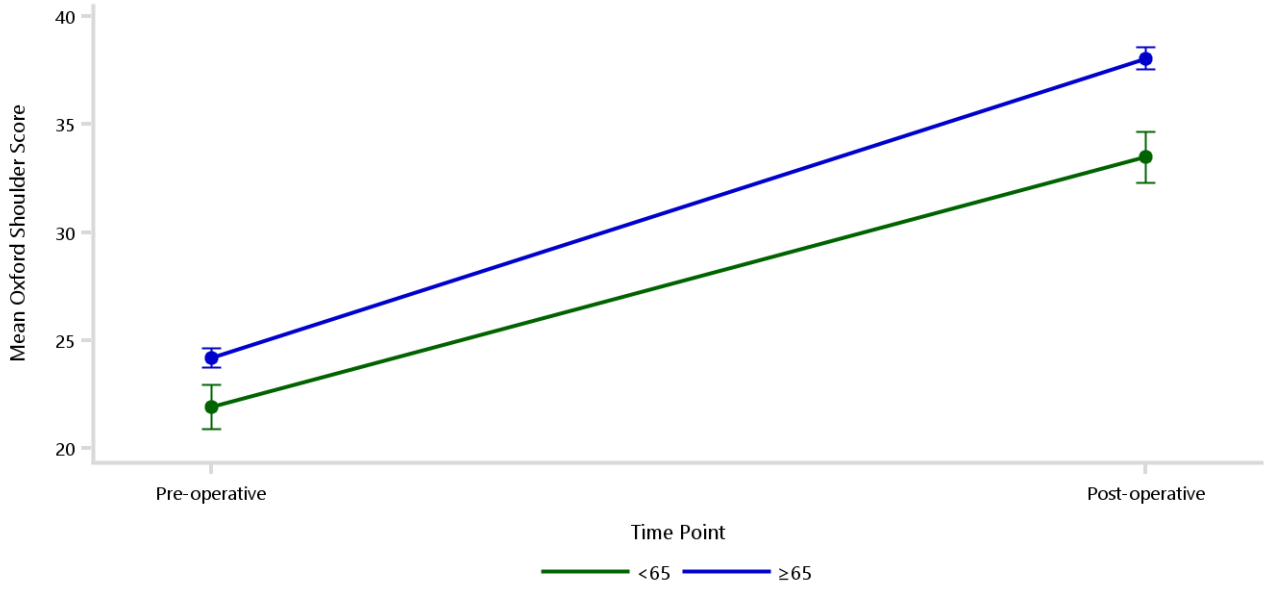
Note: Restricted to modern prostheses
Adjusted for age

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
<65	276	21.91 (20.89, 22.93)	198	33.49 (32.31, 34.67)	11.58 (10.25, 12.90)
≥65	1537	24.19 (23.76, 24.62)	1079	38.06 (37.55, 38.56)	13.87 (13.30, 14.44)

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)



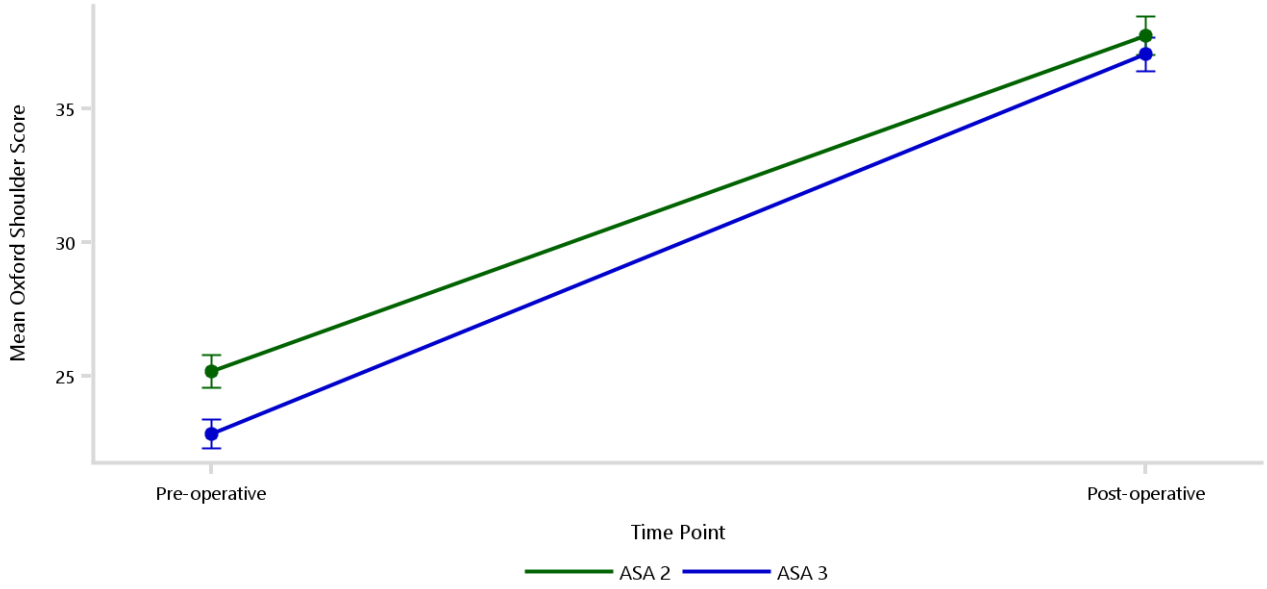
Note: Restricted to modern prostheses
Adjusted for gender

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
ASA 2	749	25.19 (24.58, 25.80)	526	37.74 (37.01, 38.47)	12.55 (11.75, 13.36)
ASA 3	969	22.83 (22.29, 23.37)	675	37.05 (36.41, 37.69)	14.22 (13.51, 14.93)

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)



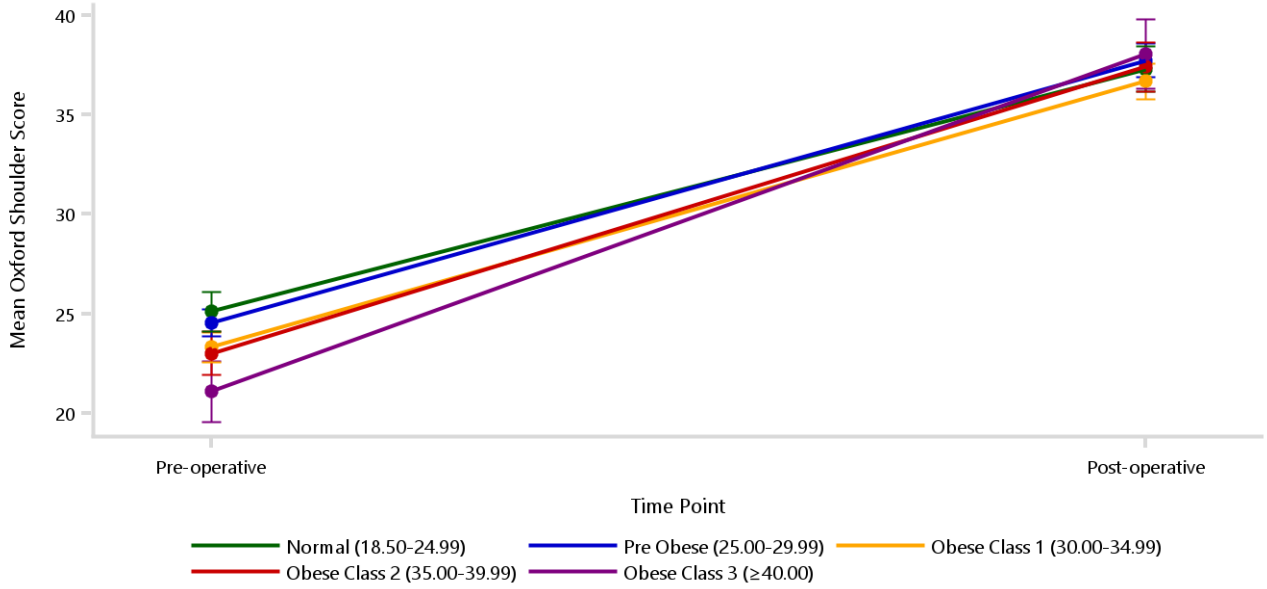
Note: Restricted to modern prostheses
Adjusted for age and gender
Only ASA categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
Normal (18.50-24.99)	296	25.12 (24.13, 26.10)	215	37.31 (36.17, 38.45)	12.19 (10.92, 13.47)
Pre Obese (25.00-29.99)	615	24.55 (23.86, 25.23)	408	37.75 (36.92, 38.57)	13.20 (12.28, 14.12)
Obese Class 1 (30.00-34.99)	502	23.33 (22.57, 24.08)	353	36.68 (35.79, 37.57)	13.36 (12.36, 14.35)
Obese Class 2 (35.00-39.99)	249	23.01 (21.93, 24.09)	188	37.41 (36.19, 38.64)	14.40 (13.03, 15.77)
Obese Class 3 (≥40.00)	123	21.09 (19.55, 22.63)	94	38.06 (36.31, 39.81)	16.97 (15.02, 18.92)

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)



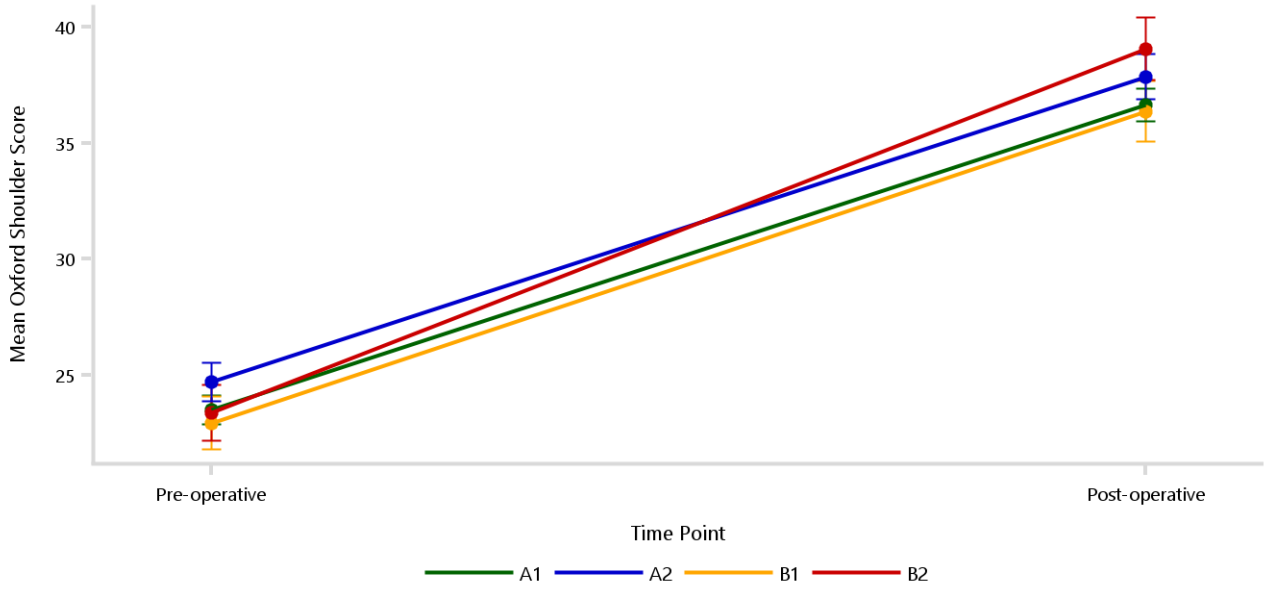
Note: Restricted to modern prostheses
Adjusted for age and gender
Only BMI categories with >40 pre-operative and post-operative responses have been included

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		Change in Score
	N	Mean (95% CI)	N	Mean (95% CI)	
A1	767	23.54 (22.92, 24.15)	539	36.65 (35.93, 37.36)	13.11 (12.31, 13.91)
A2	424	24.73 (23.90, 25.56)	302	37.86 (36.90, 38.82)	13.13 (12.06, 14.21)
B1	224	22.95 (21.81, 24.09)	161	36.37 (35.06, 37.69)	13.42 (11.95, 14.88)
B2	204	23.39 (22.19, 24.59)	153	39.06 (37.71, 40.41)	15.67 (14.16, 17.18)

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, 85.6% 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 (91.6%) of patients who rated their shoulder as much better and a little better (Table SPR77).

Patient-reported changes 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	725	57.0	364	28.6	122	9.6	41	3.2	21	1.6	1273	100.0

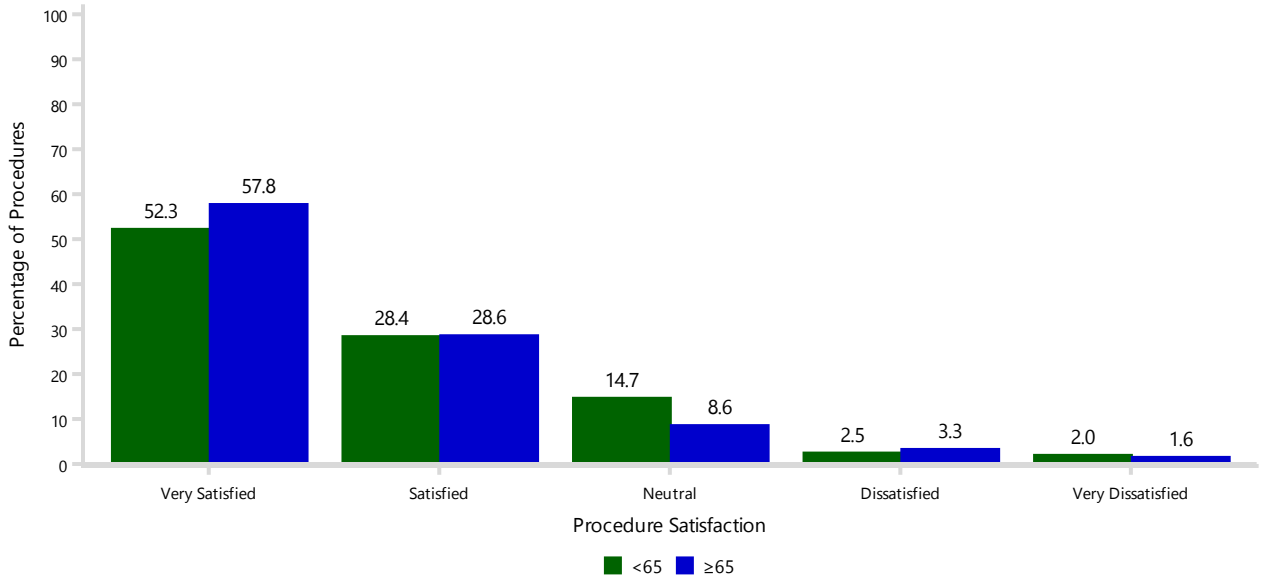
Note: Restricted to modern prostheses

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	103	52.3	14.2	56	28.4	15.4	29	14.7	23.8	5	2.5	12.2	4	2.0	19.0	197	100.0	15.5
≥65	622	57.8	85.8	308	28.6	84.6	93	8.6	76.2	36	3.3	87.8	17	1.6	81.0	1076	100.0	84.5
TOTAL	**725**	**57.0**	**100.0**	**364**	**28.6**	**100.0**	**122**	**9.6**	**100.0**	**41**	**3.2**	**100.0**	**21**	**1.6**	**100.0**	**1273**	**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)



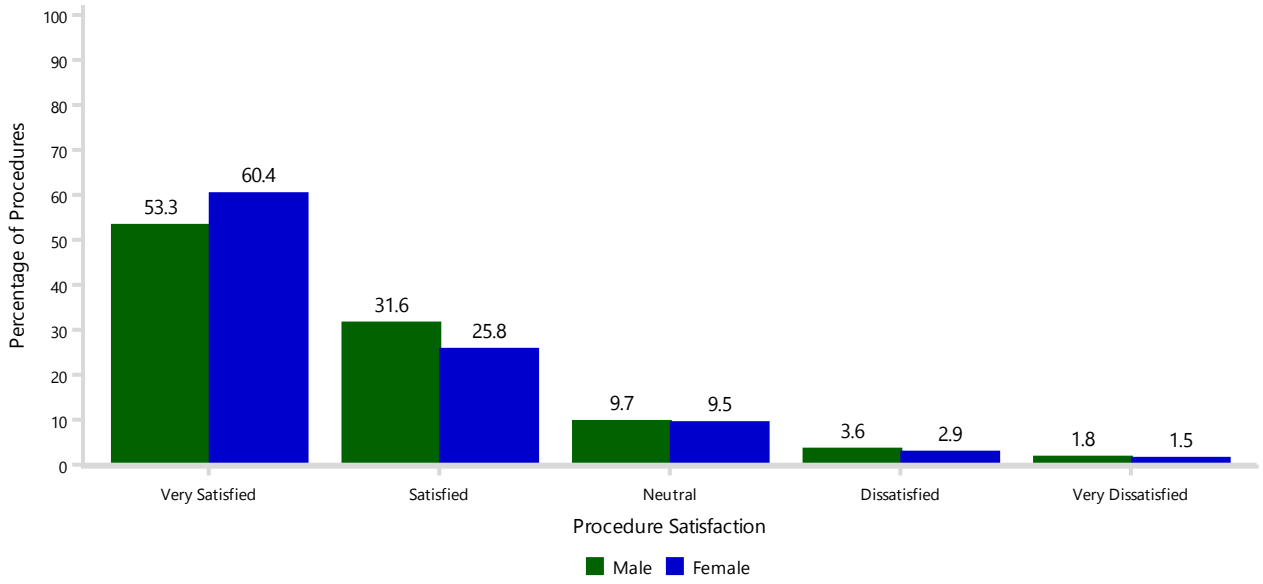
Note: Restricted to modern prostheses

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	329	53.3	45.4	195	31.6	53.6	60	9.7	49.2	22	3.6	53.7	11	1.8	52.4	617	100.0	48.5
Female	396	60.4	54.6	169	25.8	46.4	62	9.5	50.8	19	2.9	46.3	10	1.5	47.6	656	100.0	51.5
TOTAL	**725**	**57.0**	**100.0**	**364**	**28.6**	**100.0**	**122**	**9.6**	**100.0**	**41**	**3.2**	**100.0**	**21**	**1.6**	**100.0**	**1273**	**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	1002	78.7	164	12.9	62	4.9	31	2.4	14	1.1	1273	100.0

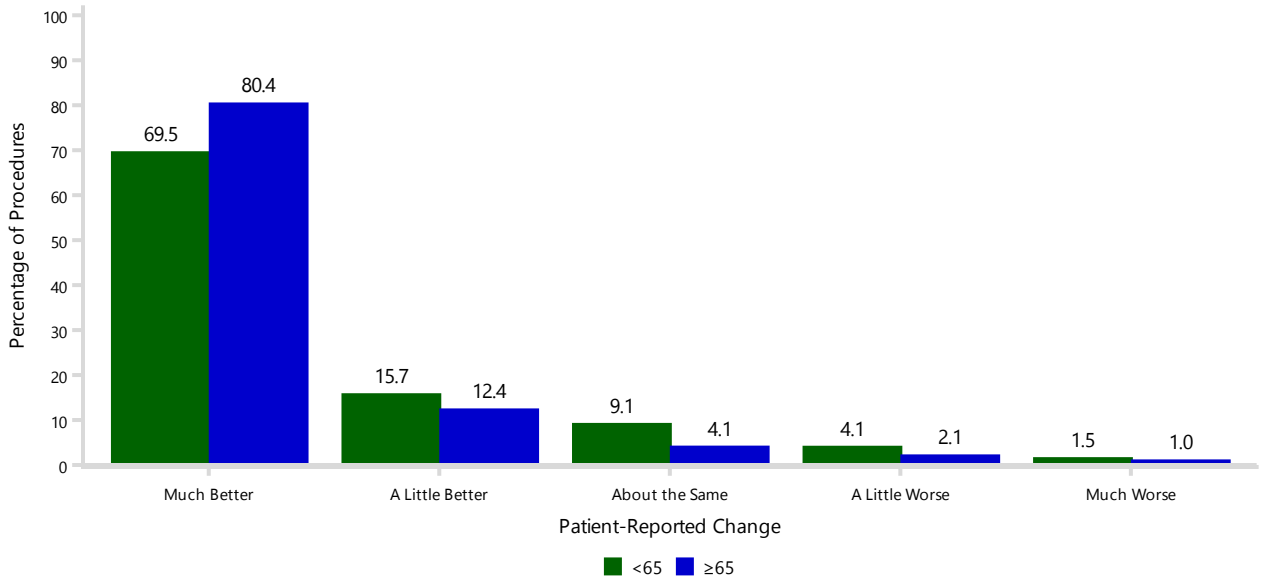
Note: Restricted to modern prostheses

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	137	69.5	13.7	31	15.7	18.9	18	9.1	29.0	8	4.1	25.8	3	1.5	21.4	197	100.0	15.5
≥65	865	80.4	86.3	133	12.4	81.1	44	4.1	71.0	23	2.1	74.2	11	1.0	78.6	1076	100.0	84.5
TOTAL	**1002**	**78.7**	**100.0**	**164**	**12.9**	**100.0**	**62**	**4.9**	**100.0**	**31**	**2.4**	**100.0**	**14**	**1.1**	**100.0**	**1273**	**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)



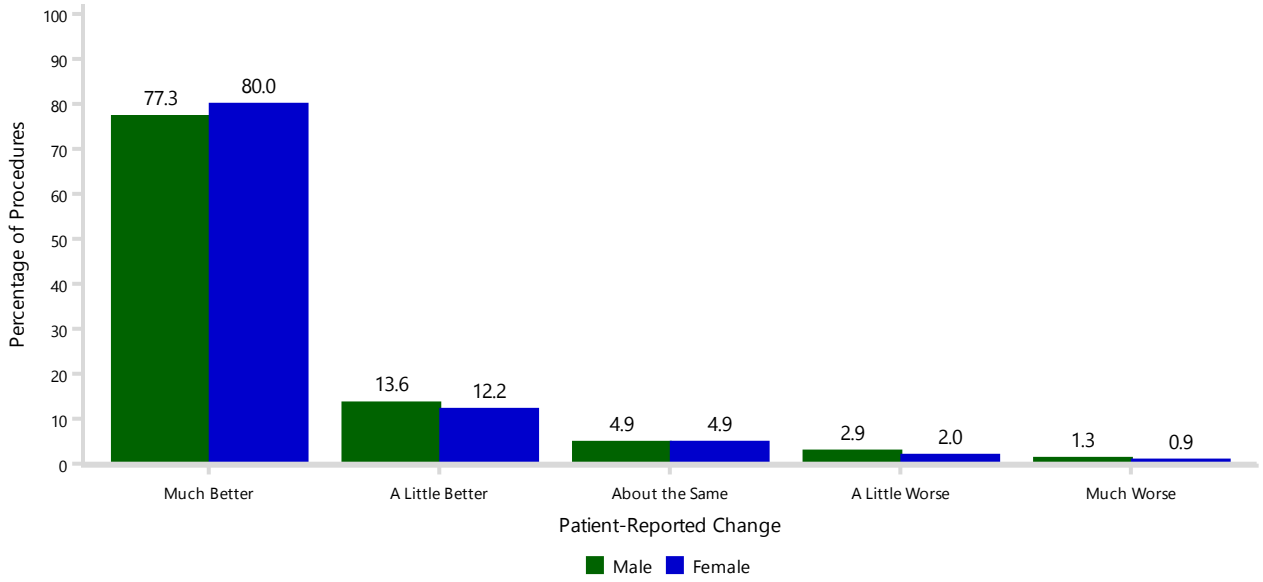
Note: Restricted to modern prostheses

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	477	77.3	47.6	84	13.6	51.2	30	4.9	48.4	18	2.9	58.1	8	1.3	57.1	617	100.0	48.5
Female	525	80.0	52.4	80	12.2	48.8	32	4.9	51.6	13	2.0	41.9	6	0.9	42.9	656	100.0	51.5
TOTAL	**1002**	**78.7**	**100.0**	**164**	**12.9**	**100.0**	**62**	**4.9**	**100.0**	**31**	**2.4**	**100.0**	**14**	**1.1**	**100.0**	**1273**	**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)



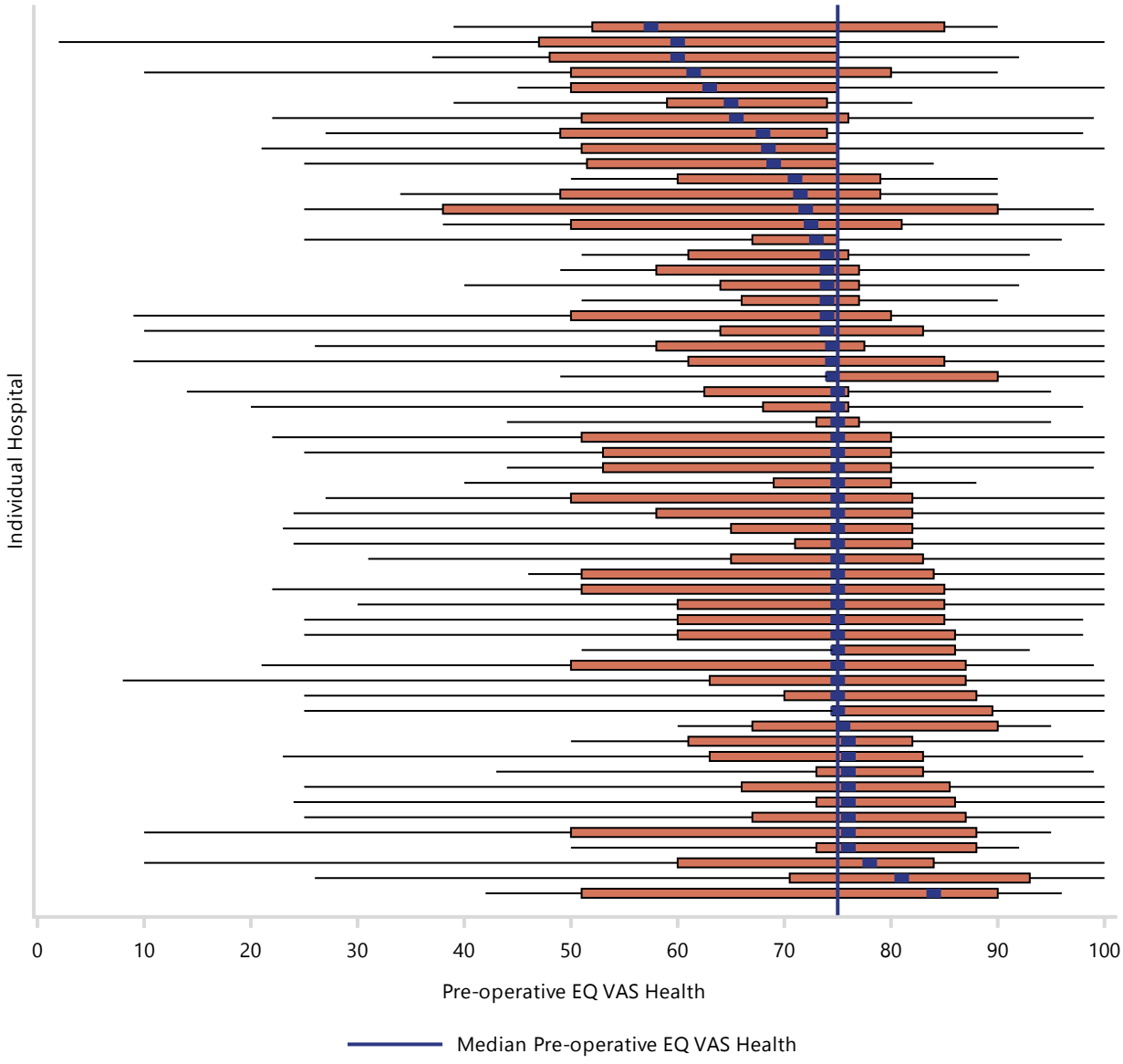
Note: Restricted to modern prostheses

HOSPITAL PROMS

EQ-VAS

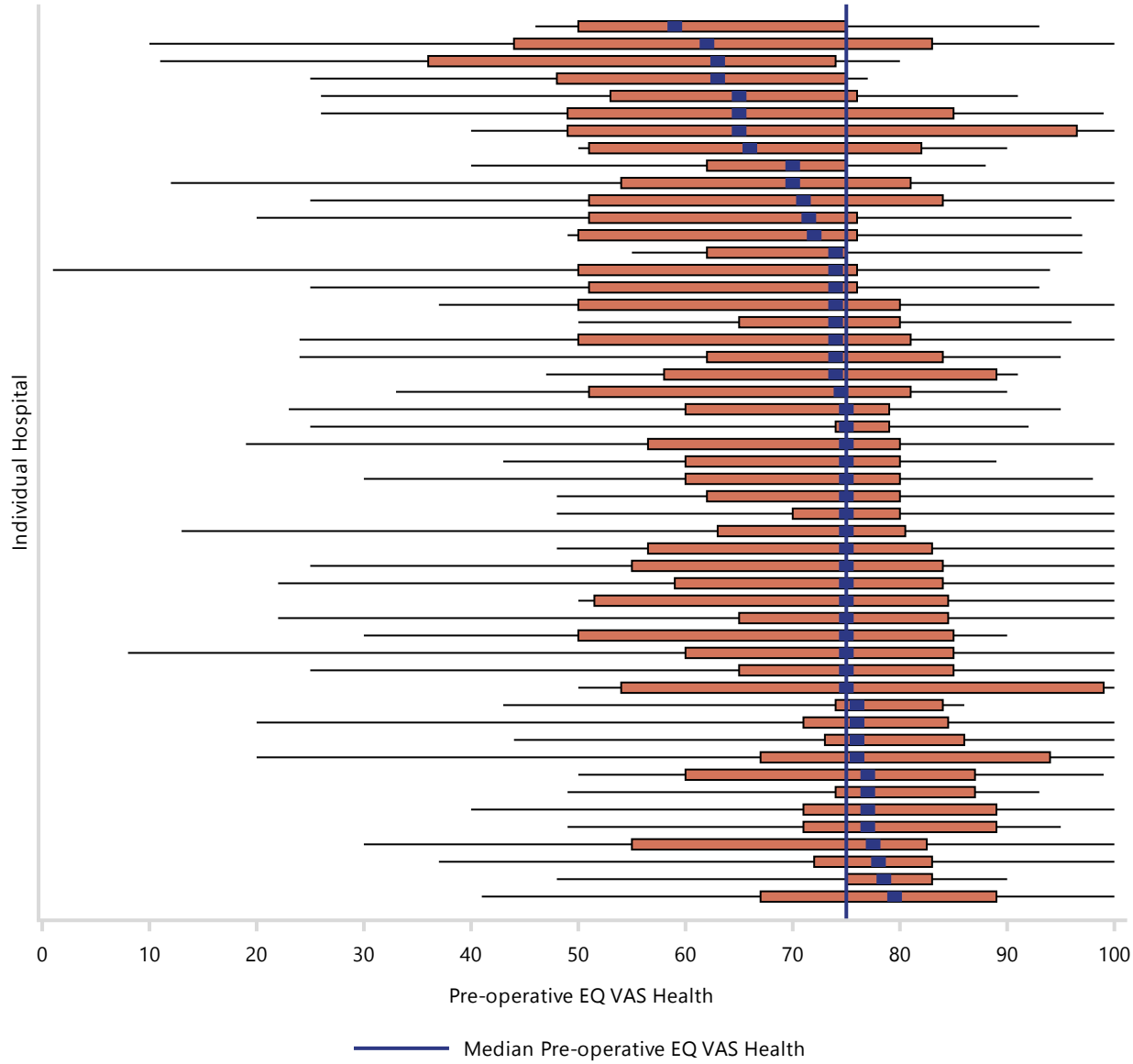
EQ-VAS Variation between hospitals in the EQ-VAS is displayed as 'caterpillar plots' for hospitals with at least 10 recorded cases for total stemmed reverse shoulder replacement for procedures with a primary diagnosis of osteoarthritis are shown in Figure SPR81 and for a primary diagnosis of rotator 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)

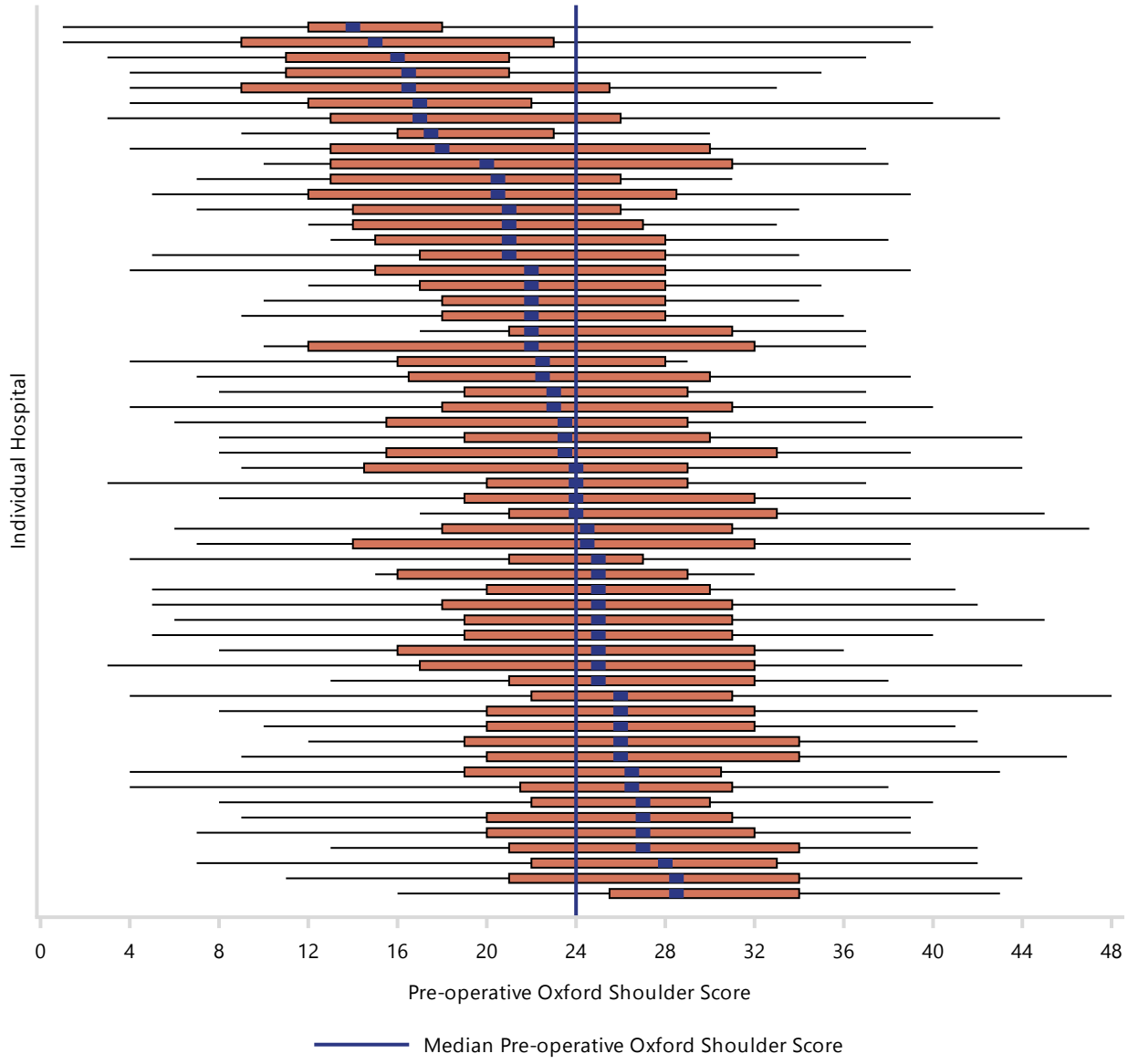


Note: The median Pre-operative EQ VAS Health is 75
Only hospitals with at least 10 procedures have been shown
Restricted to modern prostheses

Oxford Score

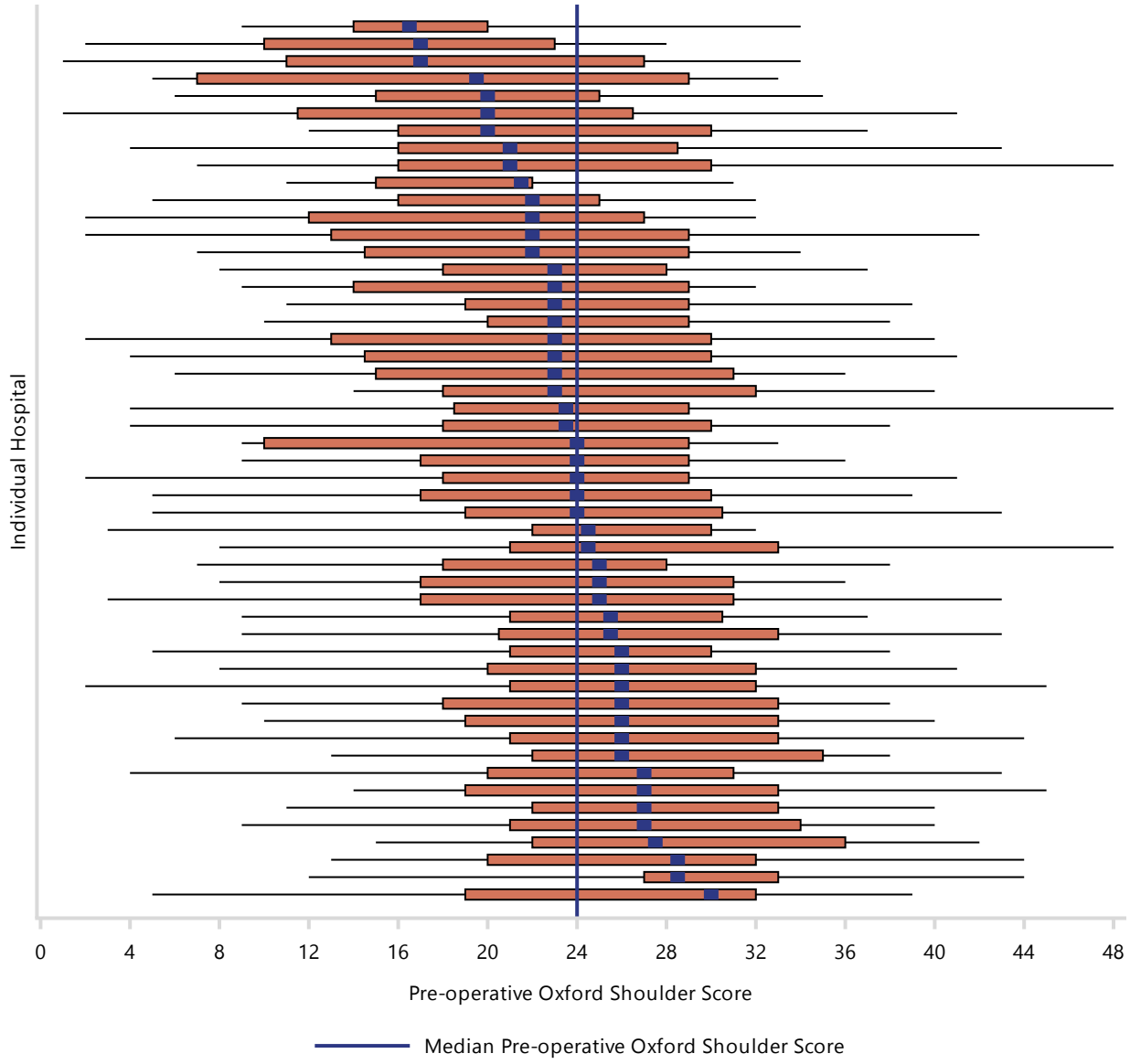
Comparisons of pre-operative Oxford Scores between hospitals for primary stemmed reverse shoulder replacement for procedures with a primary diagnosis of osteoarthritis are shown in Figure SPR83 and for a primary diagnosis of rotator cuff arthropathy are shown in Figure SPR84. These analyses show pre-operative 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 24
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

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

The AOANJRR is funded by the Australian Government Department of Health, Disability and Ageing