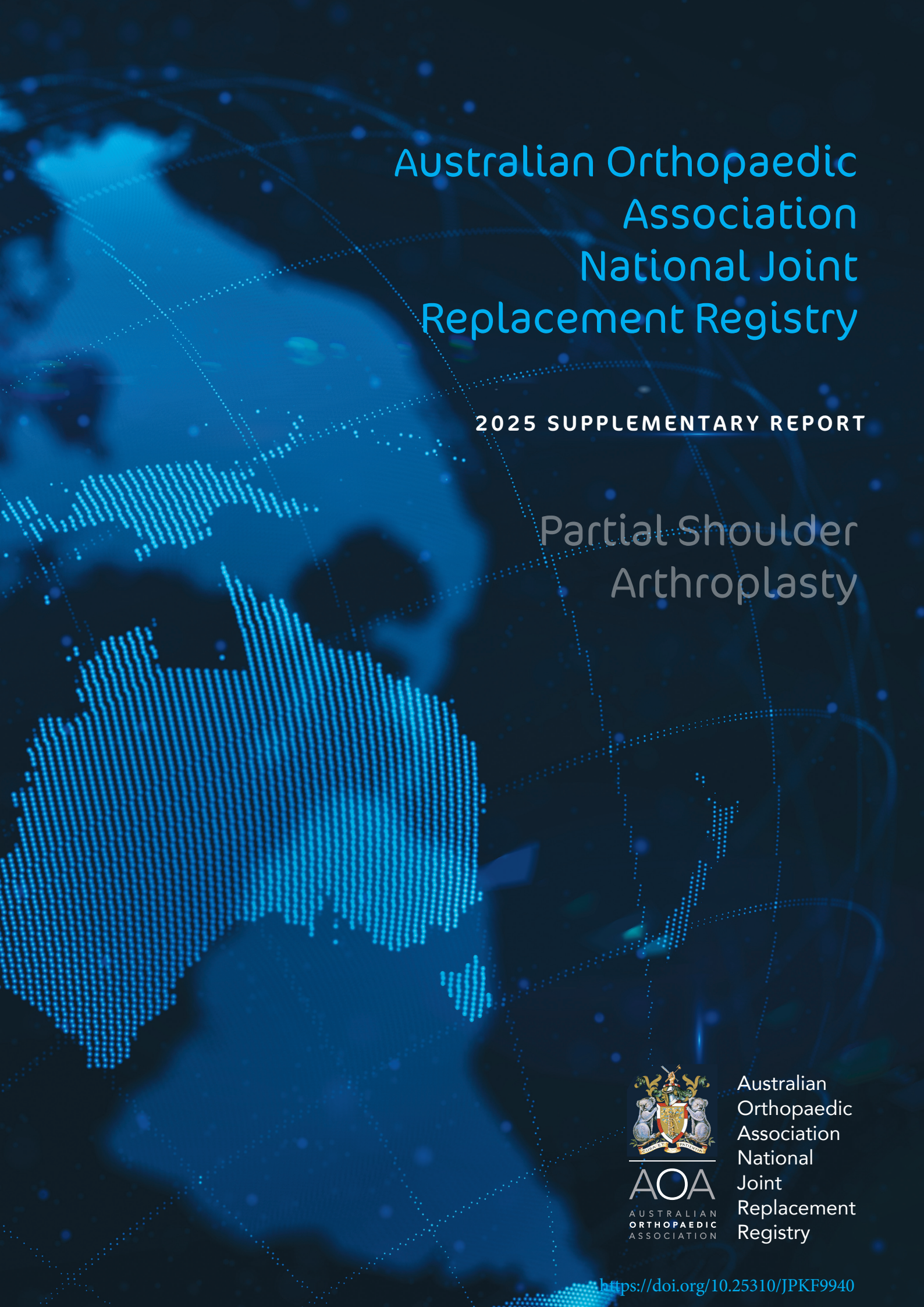
Australian Orthopaedic Association National Joint Replacement Registry

2025 SUPPLEMENTARY REPORT

Partial Shoulder Arthroplasty



Australian Orthopaedic Association National Joint Replacement Registry

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Primary Partial Shoulder Arthroplasty

2025 Supplementary Report

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Australian Orthopaedic Association

National Joint Replacement Registry

Primary Partial Shoulder Replacement

2025 Supplementary Report

Contents

Primary Partial Shoulder Replacement Introduction

This supplementary report provides detailed information on partial shoulder replacement. The Partial Shoulder Arthroplasty Report is one of 14 supplementary reports to complete the AOANJRR Annual Report for 2025.

CLASSES OF PARTIAL SHOULDER REPLACEMENT

The Registry subcategorises primary partial shoulder replacement into four main classes. These are defined by the type of prostheses used.

Partial resurfacing anatomic involves the use of one or more button prostheses to replace part of the natural articulating surface, on one or both sides of the shoulder joint.

Hemi resurfacing anatomic involves the use of a humeral prosthesis that replaces the humeral articular surface only, without resecting the head.

Hemi stemless anatomic involves resection of part of the humeral head and replacement with a humeral head and an epiphyseal fixation prosthesis.

Hemi stemmed anatomic involves the resection of the humeral head and replacement with a humeral head and a humeral stem prosthesis. A humeral stem prosthesis may have either metaphyseal or diaphyseal fixation.

Detailed information on demographics of each class of primary partial shoulder replacement is available in the supplementary report 'Demographics of Hip, Knee & Shoulder Arthroplasty' on the AOANJRR website: https://aoanjrr.sahmri.com/annual-reports-2025

USE OF PARTIAL SHOULDER REPLACEMENT

There have been 8,404 primary partial shoulder replacements reported to the Registry up to 31 December 2024. This is an additional 297 procedures compared to the number reported last year.

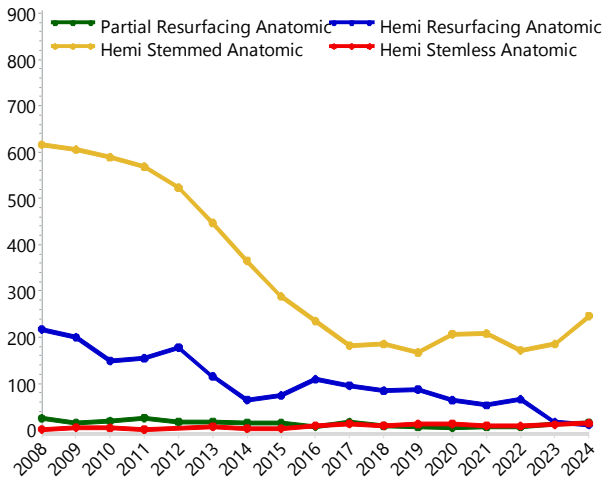
The most common class of primary partial shoulder replacement is hemi stemmed anatomic. This accounts for 73.3% of all partial shoulder replacements, followed by hemi resurfacing anatomic (22.4%), partial resurfacing anatomic (2.8%) and hemi stemless anatomic (1.5%) (Table SPS1).

Table SPS1 Primary Partial Shoulder Replacement by Class

Shoulder Class	Number	Percent
Partial Resurfacing Anatomic	239	2.8
Hemi Resurfacing Anatomic	1885	22.4
Hemi Stemmed Anatomic	6158	73.3
Hemi Stemless Anatomic	122	1.5
TOTAL	**8404**	**100.0**

The use of the two main classes of primary partial shoulder replacement has declined over the last 10 years. The number of hemi resurfacing anatomic procedures decreased from 178 in 2012 to 11 in 2024. The number of hemi stemmed anatomic procedures decreased from 616 in 2008 to 246 in 2024 (Figure SPS1).

Figure SPS1 Primary Partial Shoulder Replacement by Class



There is gender variation depending on the class of primary partial shoulder replacement. The proportions of primary partial shoulder replacement undertaken in females are hemi stemmed anatomic (65.5%), hemi stemless anatomic (35.2%), hemi resurfacing anatomic (39.9%) and partial resurfacing anatomic (21.3%) (Table SPS2).

Table SPS2 Primary Partial Shoulder Replacement by Class and Gender

Shoulder Class	Male		Female		TOTAL	
	N	Row%	N	Row%	N	Row%
Partial Resurfacing Anatomic	188	78.7	51	21.3	239	100.0
Hemi Resurfacing Anatomic	1132	60.1	753	39.9	1885	100.0
Hemi Stemmed Anatomic	2127	34.5	4031	65.5	6158	100.0
Hemi Stemless Anatomic	79	64.8	43	35.2	122	100.0
TOTAL	**3526**	**42.0**	**4878**	**58.0**	**8404**	**100.0**

The proportion of patients aged ≥65 years also varies depending on the class of primary partial shoulder replacement: hemi stemmed anatomic (63.2%), hemi resurfacing anatomic (47.1%), hemi stemless anatomic (25.4%) and partial resurfacing anatomic (15.9%) (Table SPS3).

Overall, males undergoing primary partial shoulder replacement are younger (mean age 59.5 years) compared to females (70.5 years) (Table SPS4).

The most common primary diagnosis for females is fracture (50.6%). For males, the most common primary diagnosis is osteoarthritis (60.0%) (Table SPS5).

The cumulative percent revision varies depending on class. Partial resurfacing anatomic and hemi stemless anatomic have only been used in small numbers (239 and 122 procedures, respectively). This makes any assessment of comparative performance difficult. However, there is a clear difference in the two more commonly used classes of hemi resurfacing anatomic and hemi stemmed anatomic. Devices in these classes have a longer follow-up and the cumulative percent revision at 14 years for hemi resurfacing anatomic is greater than for hemi stemmed anatomic (19.3% compared to 13.3%, respectively) (Table SPS6 and Figure SPS2).

Primary partial shoulder replacement by joint class and head material are shown in Table SPS7.

Table SPS3 Primary Partial Shoulder Replacement by Class and Age

Shoulder Class	<55		55-64		65-74		≥75		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%	N	Row%
Partial Resurfacing Anatomic	182	76.2	19	7.9	22	9.2	16	6.7	239	100.0
Hemi Resurfacing Anatomic	467	24.8	531	28.2	554	29.4	333	17.7	1885	100.0
Hemi Stemmed Anatomic	937	15.2	1330	21.6	1712	27.8	2179	35.4	6158	100.0
Hemi Stemless Anatomic	65	53.3	26	21.3	20	16.4	11	9.0	122	100.0
TOTAL	**1651**	**19.6**	**1906**	**22.7**	**2308**	**27.5**	**2539**	**30.2**	**8404**	**100.0**

Table SPS4 Age and Gender of Primary Partial Shoulder Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	3526	42.0%	14	94	61	59.5	14.5
Female	4878	58.0%	13	101	72	70.5	12.1
TOTAL	**8404**	**100.0%**	**13**	**101**	**67**	**65.9**	**14.2**

Table SPS5 Primary Partial Shoulder Replacement by Primary Diagnosis and Gender

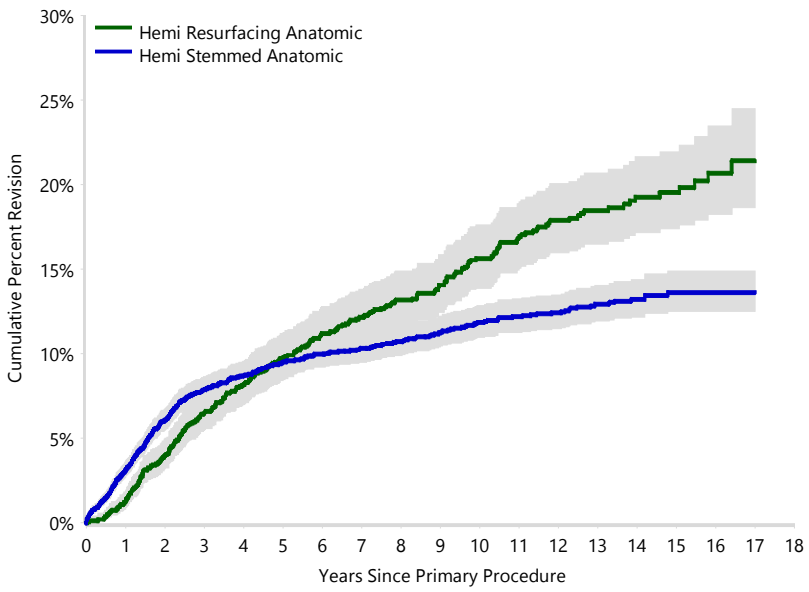
Primary Diagnosis	Male		Female		TOTAL	
	N	Col%	N	Col%	N	Col%
Osteoarthritis	2116	60.0	1690	34.6	3806	45.3
Fracture	783	22.2	2468	50.6	3251	38.7
Rotator Cuff Arthropathy	134	3.8	232	4.8	366	4.4
Osteonecrosis	142	4.0	179	3.7	321	3.8
Instability	188	5.3	78	1.6	266	3.2
Tumour	124	3.5	86	1.8	210	2.5
Rheumatoid Arthritis	23	0.7	112	2.3	135	1.6
Other Inflammatory Arthritis	13	0.4	30	0.6	43	0.5
Osteochondritis Dissecans	2	0.1	.	.	2	0.0
Other	1	0.0	3	0.1	4	0.0
TOTAL	**3526**	**100.0**	**4878**	**100.0**	**8404**	**100.0**

Note: Instability includes instability, dislocation, and Hills-Sachs Defect

Table SPS6 Cumulative Percent Revision of Primary Partial Shoulder Replacement by Class (All Diagnoses)

Shoulder Class	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Partial Resurfacing Anatomic	19	239	0.4 (0.1, 3.1)	1.4 (0.4, 4.2)	3.0 (1.3, 6.5)	5.2 (2.8, 9.4)	7.2 (4.2, 12.1)	11.1 (6.9, 17.8)
Hemi Resurfacing Anatomic	280	1885	1.3 (0.9, 1.9)	6.5 (5.4, 7.7)	9.7 (8.4, 11.2)	12.1 (10.7, 13.8)	15.6 (13.9, 17.6)	19.3 (17.2, 21.6)
Hemi Stemmed Anatomic	609	6158	3.1 (2.7, 3.6)	7.9 (7.2, 8.6)	9.5 (8.8, 10.3)	10.3 (9.5, 11.2)	11.9 (11.0, 12.9)	13.3 (12.2, 14.4)
Hemi Stemless Anatomic	16	122	5.3 (2.4, 11.5)	11.6 (6.7, 19.6)	16.5 (10.3, 25.6)			
TOTAL	**924**	**8404**						

Figure SPS2 Cumulative Percent Revision of Primary Partial Shoulder Replacement by Class (All Diagnoses)



HR - adjusted for age and gender

Hemi Stemmed Anatomic vs

Hemi Resurfacing Anatomic

0 - 9Mth: HR=3.38 (95% CI 1.95, 5.87), p<0.001

9Mth - 1.5Yr: HR=1.08 (95% CI 0.77, 1.52), p=0.656

1.5Yr - 2Yr: HR=1.73 (95% CI 1.00, 2.97), p=0.048

2Yr - 2.5Yr: HR=0.87 (95% CI 0.55, 1.36), p=0.534

2.5Yr+: HR=0.45 (95% CI 0.37, 0.56), p<0.001

Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Hemi Resurfacing Anatomic	1885	1842	1633	1412	1164	820	366
Hemi Stemmed Anatomic	6158	5492	4498	3690	2978	2001	764

Table SPS7 Primary Partial Shoulder Replacement by Joint Class and Head Material (All Diagnoses)

Joint Class	CERAMIC		METAL		PYROCARBON		TOTAL	
	N	Row%	N	Row%	N	Row%	N	Row%
Hemi Resurfacing Anatomic	.	.	1189	63.1	695	36.9	1884	100.0
Hemi Stemmed Anatomic	50	0.8	5187	84.3	916	14.9	6153	100.0
Hemi Stemless Anatomic	82	67.2	40	32.8	.	.	122	100.0
TOTAL	**132**	**1.6**	**6416**	**78.6**	**1611**	**19.7**	**8159**	**100.0**

PRIMARY PARTIAL RESURFACING ANATOMIC SHOULDER REPLACEMENT

DEMOGRAPHICS AND OUTCOMES

There have been 239 primary partial resurfacing anatomic shoulder replacement procedures reported to the Registry. This is an additional 21 procedures compared to the previous report.

This procedure is undertaken more commonly in males (78.7%). The mean age for males is 38.0 years compared to 53.3 years for females (Table SPS8).

The most common primary diagnosis is instability (57.3%) (Table SPS9).

The cumulative percent revision at 10 years is 7.2% (Table SPS6). Of the 19 revisions, 11 are for glenoid erosion, 3 are for instability/dislocation, 2 are for rotator cuff insufficiency, and 1 each for loosening, lysis and infection. All but one underwent a humeral/glenoid revision.

Table SPS8 Age and Gender of Primary Partial Resurfacing Anatomic Shoulder Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	188	78.7%	14	87	34	38.0	17.0
Female	51	21.3%	16	88	54	53.3	20.1
TOTAL	**239**	**100.0%**	**14**	**88**	**38**	**41.3**	**18.7**

Table SPS9 Primary Partial Resurfacing Anatomic Shoulder Replacement by Primary Diagnosis and Gender

Primary Diagnosis	Male		Female		TOTAL	
	N	Col%	N	Col%	N	Col%
Instability	114	60.6	23	45.1	137	57.3
Osteoarthritis	53	28.2	21	41.2	74	31.0
Fracture	15	8.0	3	5.9	18	7.5
Osteonecrosis	2	1.1	3	5.9	5	2.1
Osteochondritis Dissecans	2	1.1	.	.	2	0.8
Rotator Cuff Arthropathy	2	1.1	.	.	2	0.8
Rheumatoid Arthritis	.	.	1	2.0	1	0.4
TOTAL	**188**	**100.0**	**51**	**100.0**	**239**	**100.0**

PRIMARY HEMI RESURFACING ANATOMIC SHOULDER REPLACEMENT

DEMOGRAPHICS

There have been 1,885 primary hemi resurfacing anatomic shoulder replacements reported to the Registry. This is an additional 11 procedures compared to the previous report. The use of primary hemi resurfacing has declined by 55.8% since 2008.

This procedure is more common in males (60.1%). The mean age is 59.6 years for males and 67.5 years for females (Table SPS10).

Osteoarthritis is the most common primary diagnosis (88.5%). The range of diagnoses is similar for males and females (Table SPS11).

In 2024, all primary hemi resurfacing procedures reported to the Registry used the PyroTITAN (Table SPS12).

Table SPS10 Age and Gender of Primary Hemi Resurfacing Anatomic Shoulder Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	1132	60.1%	19	90	60	59.6	12.0
Female	753	39.9%	27	93	68	67.5	11.4
TOTAL	**1885**	**100.0%**	**19**	**93**	**63**	**62.7**	**12.4**

Table SPS11 Primary Hemi Resurfacing Anatomic Shoulder Replacement by Primary Diagnosis and Gender

Primary Diagnosis	Male		Female		TOTAL	
	N	Col%	N	Col%	N	Col%
Osteoarthritis	1009	89.1	660	87.6	1669	88.5
Rotator Cuff Arthropathy	51	4.5	36	4.8	87	4.6
Instability	31	2.7	7	0.9	38	2.0
Osteonecrosis	19	1.7	18	2.4	37	2.0
Rheumatoid Arthritis	9	0.8	19	2.5	28	1.5
Fracture	10	0.9	4	0.5	14	0.7
Other Inflammatory Arthritis	3	0.3	9	1.2	12	0.6
TOTAL	**1132**	**100.0**	**753**	**100.0**	**1885**	**100.0**

Note: Instability includes instability and dislocation

Table SPS12 Most Used Humeral Head Prostheses in Primary Hemi Resurfacing Anatomic Shoulder Replacement

2008		2021		2022		2023		2024	
N	Model	N	Model	N	Model	N	Model	N	Model
124	Copeland	53	PyroTITAN	66	PyroTITAN	16	PyroTITAN	11	PyroTITAN
45	Global CAP								
34	SMR								
11	Aequalis								
2	Epoca RH								
1	Buechel-Pappas								
Most Used									
217 (6)	100.0%	53 (1)	100.0%	66 (1)	100.0%	16 (1)	100.0%	11 (1)	100.0%

OUTCOME FOR ALL DIAGNOSES

Reason for Revision

The main reasons for revision of primary hemi resurfacing anatomic shoulder replacement are glenoid erosion (28.6%), pain (18.6%), rotator cuff insufficiency (12.5%), and instability/dislocation (10.0%) (Table SPS13 and Figure SPS3).

There have been 16 reported breakages of the PyroTITAN prosthesis. Three of these breakages were reported secondary to loosening.

Type of Revision

The most common type of revision is to a total shoulder replacement (88.6%) (Table SPS14). Of these, 162 (65.3%) were revised to a total reverse shoulder and 84 (33.9%) to a total stemmed shoulder replacement.

Glenoid erosion and pain are the reasons for 47.2% of all hemi resurfacing anatomic shoulder revisions.

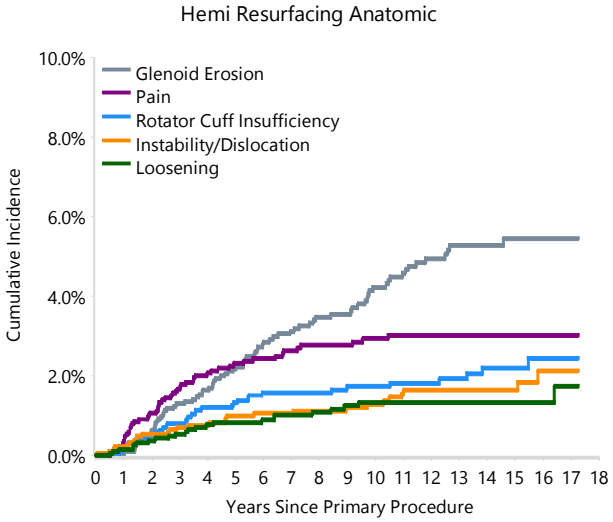
Table SPS13 Primary Hemi Resurfacing Anatomic Shoulder Replacement by Reason for Revision (All Diagnoses)

Reason for Revision	Number	Percent
Glenoid Erosion	80	28.6
Pain	52	18.6
Rotator Cuff Insufficiency	35	12.5
Instability/Dislocation	28	10.0
Loosening	23	8.2
Implant Breakage Head	16	5.7
Fracture	13	4.6
Lysis	10	3.6
Infection	8	2.9
Arthrofibrosis	3	1.1
Malposition	3	1.1
Metal Related Pathology	3	1.1
Wear Glenoid Insert	2	0.7
Incorrect Sizing	2	0.7
Osteonecrosis	1	0.4
Implant Breakage Humeral	1	0.4
TOTAL	280	100.0

Table SPS14 Primary Hemi Resurfacing Anatomic Shoulder Replacement by Type of Revision (All Diagnoses)

Type of Revision	Number	Percent
Humeral/Glenoid	248	88.6
Humeral Component	18	6.4
Glenoid Component	6	2.1
Cement Spacer	4	1.4
Removal of Prostheses	2	0.7
Reoperation	1	0.4
Head Only	1	0.4
TOTAL	280	100.0

Figure SPS3 Cumulative Incidence Revision Diagnosis of Primary Hemi Resurfacing Anatomic Shoulder Replacement (All Diagnoses)



OUTCOME FOR OSTEOARTHRITIS

Age and Gender

Patients aged 65-74 years have a lower rate of revision after 1.5 years compared to patients aged <55 years, whereas patients aged ≥75 years have a lower rate of revision after 2.5 years (Table SPS15 and Figure SPS4).

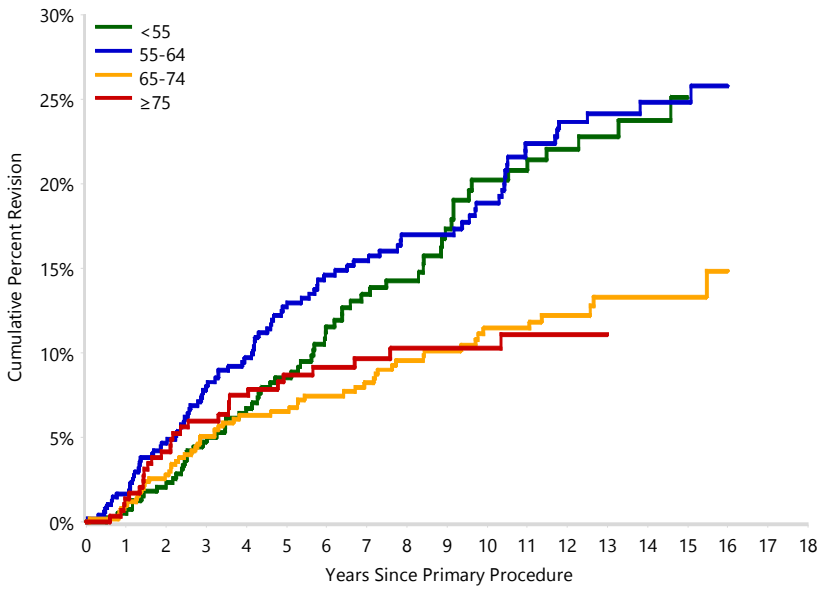
Females have a higher rate of revision than males (Table SPS16 and Figure SPS5).

The outcomes of the most commonly used prostheses are listed in Table SPS17. The PyroTITAN was the only hemi-resurfacing prosthesis remaining in use since 2021. It has a cumulative percent revision of 7.0% (95% CI 4.7, 10.2) at 10 years (Table SPS17).

Table SPS15 Cumulative Percent Revision of Primary Hemi Resurfacing Anatomic Shoulder Replacement by Age (Primary Diagnosis OA)

Age	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	64	392	0.5 (0.1, 2.0)	4.7 (3.0, 7.4)	8.6 (6.1, 12.0)	13.4 (10.2, 17.7)	20.2 (15.8, 25.7)	23.8 (18.7, 30.0)
55-64	92	477	1.7 (0.8, 3.3)	8.0 (5.9, 10.9)	12.7 (9.9, 16.2)	15.4 (12.3, 19.3)	18.9 (15.3, 23.2)	24.8 (20.5, 30.0)
65-74	55	505	1.0 (0.4, 2.4)	5.0 (3.4, 7.4)	6.5 (4.7, 9.1)	8.2 (6.1, 11.1)	11.5 (8.8, 14.9)	13.3 (10.2, 17.3)
≥75	28	295	1.4 (0.5, 3.6)	6.0 (3.8, 9.4)	8.7 (5.9, 12.7)	9.7 (6.7, 13.9)	10.3 (7.1, 14.7)	
TOTAL	239	1669						

Figure SPS4 Cumulative Percent Revision of Primary Hemi Resurfacing Anatomic Shoulder Replacement by Age (Primary Diagnosis OA)



HR - adjusted for gender

55-64 vs <55

Entire Period: HR=1.07 (95% CI 0.77, 1.48), p=0.690

65-74 vs <55

0 - 1Yr: HR=0.80 (95% CI 0.28, 2.32), p=0.683

1Yr - 1.5Yr: HR=0.78 (95% CI 0.31, 1.92), p=0.585

1.5Yr+: HR=0.48 (95% CI 0.32, 0.72), p<0.001

≥75 vs <55

0 - 1.5Yr: HR=0.96 (95% CI 0.43, 2.12), p=0.914

1.5Yr - 2.5Yr: HR=0.94 (95% CI 0.40, 2.25), p=0.896

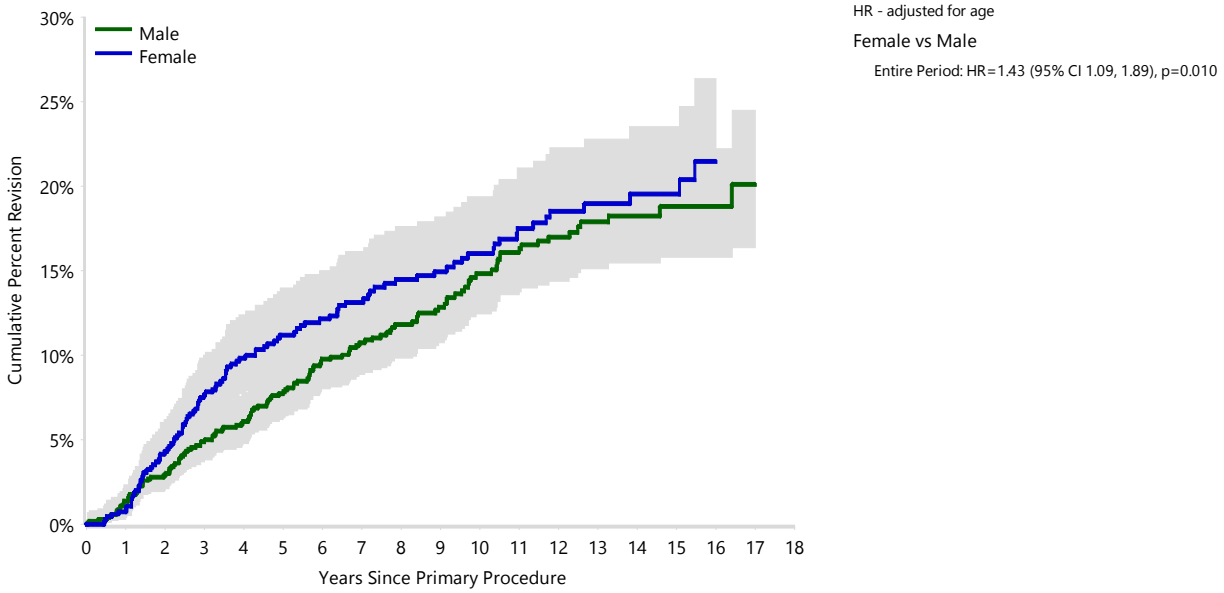
2.5Yr+: HR=0.29 (95% CI 0.15, 0.56), p<0.001

Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	392	387	342	293	214	134	66
55-64	477	462	399	341	286	212	105
65-74	505	498	455	409	357	259	109
≥75	295	287	256	214	168	113	38

Table SPS16 Cumulative Percent Revision of Primary Hemi Resurfacing Anatomic Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	135	1009	1.4 (0.8, 2.3)	4.9 (3.7, 6.4)	7.7 (6.2, 9.6)	10.7 (8.9, 13.0)	14.8 (12.5, 17.6)	18.3 (15.4, 21.5)
Female	104	660	0.8 (0.3, 1.8)	7.7 (5.8, 10.0)	11.2 (9.0, 14.0)	13.2 (10.7, 16.1)	16.0 (13.2, 19.4)	19.5 (16.2, 23.5)
TOTAL	**239**	**1669**						

Figure SPS5 Cumulative Percent Revision of Primary Hemi Resurfacing Anatomic Shoulder Replacement by Gender (Primary Diagnosis OA)



Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	1009	987	879	765	618	419	186
Female	660	647	573	492	407	299	132

Table SPS17 Cumulative Percent Revision of Primary Hemi Resurfacing Anatomic Shoulder Replacement by Humeral Head (Primary Diagnosis OA)

Humeral Head	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Aequalis	18	78	1.3 (0.2, 8.9)	10.4 (5.3, 19.7)	15.9 (9.3, 26.3)	19.0 (11.7, 30.0)	23.6 (15.3, 35.3)	25.3 (16.7, 37.3)
Copeland	99	556	1.6 (0.8, 3.1)	6.6 (4.8, 9.0)	10.1 (7.8, 12.9)	12.7 (10.2, 15.9)	16.2 (13.2, 19.7)	20.0 (16.6, 24.0)
Global CAP	47	224	0.4 (0.1, 3.1)	9.0 (5.9, 13.6)	12.2 (8.5, 17.3)	15.5 (11.3, 21.0)	20.4 (15.5, 26.6)	23.4 (18.0, 30.1)
PyroTITAN	34	641	1.1 (0.5, 2.3)	3.1 (2.0, 4.8)	4.5 (3.1, 6.6)	5.0 (3.5, 7.2)	7.0 (4.7, 10.2)	
SMR	35	146	0.0 (0.0, 0.0)	7.0 (3.8, 12.6)	14.3 (9.4, 21.2)	20.7 (14.7, 28.6)	24.3 (17.8, 32.6)	
Other (4)	6	24	4.2 (0.6, 26.1)	16.7 (6.6, 38.5)	16.7 (6.6, 38.5)	21.9 (9.7, 45.1)	21.9 (9.7, 45.1)	29.7 (13.9, 56.3)
TOTAL	**239**	**1669**						

Note: Only prostheses with >50 procedures have been listed

PRIMARY HEMI STEMLESS ANATOMIC SHOULDER REPLACEMENT

DEMOGRAPHICS AND OUTCOME

There have been 122 primary hemi stemless anatomic shoulder replacement procedures reported to the Registry. This is an additional 14 procedures compared to the previous report.

This procedure is undertaken more commonly in males (64.8%). The mean age is 50.7 years for males and 62.6 years for females (Table SPS18).

Osteoarthritis is the most common primary diagnosis (63.1%) (Table SPS19).

Of the 16 revisions reported, 5 are for glenoid erosion, 3 for fracture, 3 for rotator cuff insufficiency, 2 for pain, and 1 each for loosening, instability/dislocation and arthrofibrosis (Table SPS20).

The most common type of revision is to a total shoulder replacement (Table SPS21).

The most common humeral head and stem prosthesis combinations are the Affinis/Affinis, Comprehensive/Comprehensive and the Eclipse/Eclipse.

Outcomes for the most used prosthesis combinations are presented in Table SPS22.

Table SPS18 Age and Gender of Primary Hemi Stemless Anatomic Shoulder Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	79	64.8%	18	83	51	50.7	12.1
Female	43	35.2%	30	86	66	62.6	15.5
TOTAL	**122**	**100.0%**	**18**	**86**	**53**	**54.9**	**14.5**

Table SPS19 Primary Hemi Stemless Anatomic Shoulder Replacement by Primary Diagnosis and Gender

Primary Diagnosis	Male		Female		TOTAL	
	N	Col%	N	Col%	N	Col%
Osteoarthritis	50	63.3	27	62.8	77	63.1
Osteonecrosis	19	24.1	11	25.6	30	24.6
Fracture	3	3.8	3	7.0	6	4.9
Rotator Cuff Arthropathy	4	5.1	.	.	4	3.3
Instability	1	1.3	1	2.3	2	1.6
Rheumatoid Arthritis	.	.	1	2.3	1	0.8
Other Inflammatory Arthritis	1	1.3	.	.	1	0.8
Other	1	1.3	.	.	1	0.8
TOTAL	**79**	**100.0**	**43**	**100.0**	**122**	**100.0**

Table SPS20 Primary Hemi Stemless Anatomic Shoulder Replacement by Reason for Revision

Reason for Revision	Number	Percent
Glenoid Erosion	5	31.3
Fracture	3	18.8
Rotator Cuff Insufficiency	3	18.8
Pain	2	12.5
Loosening	1	6.3
Instability/Dislocation	1	6.3
Arthrofibrosis	1	6.3
TOTAL	**16**	**100.0**

Note: Fracture includes proximal humerus fracture

Table SPS21 Primary Hemi Stemless Anatomic Shoulder Replacement by Type of Revision

Type of Revision	Number	Percent
Humeral/Glenoid	8	50.0
Glenoid Component	5	31.3
Humeral Component	2	12.5
Head Only	1	6.3
TOTAL	**16**	**100.0**

Table SPS22 Cumulative Percent Revision of Primary Hemi Stemless Anatomic Shoulder Replacement by Prosthesis Combination

Humeral Head	Humeral Stem	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Affinis	Affinis	7	82	4.2 (1.4, 12.4)	7.1 (3.0, 16.3)	10.7 (5.2, 21.4)	10.7 (5.2, 21.4)		
Affiniti	Simpliciti	4	7	0.0 (0.0, 0.0)	48.6 (18.7, 88.2)	65.7 (31.5, 95.2)	65.7 (31.5, 95.2)	65.7 (31.5, 95.2)	
Comprehensive	Comprehensive	2	11	18.2 (4.9, 55.3)	18.2 (4.9, 55.3)				
Eclipse	Eclipse	1	10	0.0 (0.0, 0.0)	11.1 (1.6, 56.7)	11.1 (1.6, 56.7)	11.1 (1.6, 56.7)	11.1 (1.6, 56.7)	11.1 (1.6, 56.7)
Simpliciti	Simpliciti	1	7	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	20.0 (3.1, 79.6)	20.0 (3.1, 79.6)		
Other (4)		1	5	20.0 (3.1, 79.6)	20.0 (3.1, 79.6)	20.0 (3.1, 79.6)	20.0 (3.1, 79.6)		
TOTAL		**16**	**122**						

Note: Only prostheses with >7 procedures have been listed

PRIMARY HEMI STEMMED ANATOMIC SHOULDER REPLACEMENT

DEMOGRAPHICS

There have been 6,158 primary hemi stemmed anatomic shoulder replacement procedures reported to the Registry. This is an additional 251 procedures compared to the previous report.

This procedure is more common in females (65.5%). The mean age is 71.4 years for females and 61.6 years for males (Table SPS23).

The most common primary diagnosis is fracture (52.2%), followed by osteoarthritis (32.3%) (Table SPS24). In 2023, the number of primary hemi stemmed anatomic shoulder replacements undertaken for fracture decreased by 92.1% compared to 2008. In 2024, the number of primary hemi stemmed anatomic shoulder replacements undertaken for osteoarthritis decreased by 9.6% compared to 2008 (Figure SPS6).

The most common humeral head prostheses used in 2024 are the Ascend Flex PyC, Comprehensive and Ascend Flex.

The 10 most used humeral head prostheses account for 98.8% of all primary hemi stemmed anatomic procedures in 2024. This has slightly increased from 98.2% in 2008 (Table SPS25).

The most common humeral stem prostheses used in 2024 are the Ascend Flex, Comprehensive, Global Unite and SMR. The 10 most used humeral stem prostheses account for 99.6% of all primary hemi stemmed procedures in 2024. This has increased from 97.2% in 2008 (Table SPS26).

There has been a major decline in the use of primary hemi stemmed anatomic shoulder replacement for the management of fracture.

Table SPS23 Age and Gender of Primary Hemi Stemmed Anatomic Shoulder Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	2127	34.5%	14	94	62	61.6	13.8
Female	4031	65.5%	13	101	73	71.4	11.8
TOTAL	**6158**	**100.0%**	**13**	**101**	**69**	**68.0**	**13.4**

Table SPS24 Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis and Gender

Primary Diagnosis	Male		Female		TOTAL	
	N	Col%	N	Col%	N	Col%
Fracture	755	35.5	2458	61.0	3213	52.2
Osteoarthritis	1004	47.2	982	24.4	1986	32.3
Rotator Cuff Arthropathy	77	3.6	196	4.9	273	4.4
Osteonecrosis	102	4.8	147	3.6	249	4.0
Tumour	124	5.8	86	2.1	210	3.4
Rheumatoid Arthritis	14	0.7	91	2.3	105	1.7
Instability	42	2.0	47	1.2	89	1.4
Other Inflammatory Arthritis	9	0.4	21	0.5	30	0.5
Other	.	.	3	0.1	3	0.0
TOTAL	**2127**	**100.0**	**4031**	**100.0**	**6158**	**100.0**

Note: Instability includes instability and dislocation

Figure SPS6 Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis

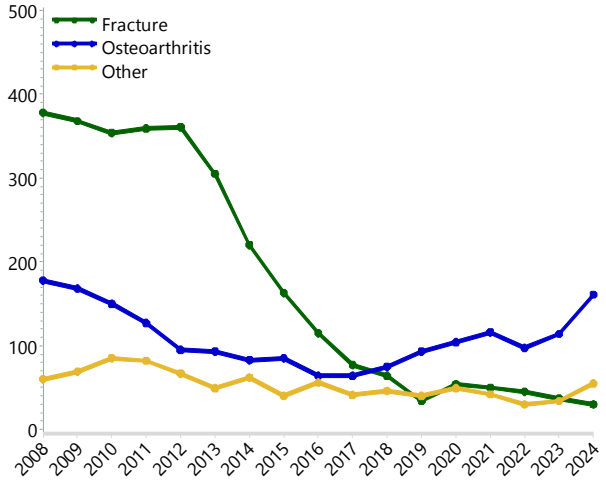


Table SPS25 10 Most Used Humeral Head Prostheses in Primary Hemi Stemmed Anatomic Shoulder Replacement

2008		2021		2022		2023		2024	
N	Model	N	Model	N	Model	N	Model	N	Model
197	Global Advantage	129	Ascend Flex PyC	105	Ascend Flex PyC	132	Ascend Flex PyC	179	Ascend Flex PyC
177	SMR	15	Comprehensive	14	Equinoxe	14	Comprehensive	18	Comprehensive
98	Aequalis	15	Equinoxe	10	Comprehensive	9	Global Unite	11	Ascend Flex
38	Bigliani/Flatow	9	SMR CTA	8	Mutars	6	Mutars	11	Global Unite
31	SMR CTA	8	Global Unite	6	SMR	6	SMR CTA	6	Equinoxe
22	Global Advantage CTA	6	Aequalis	6	SMR CTA	5	SMR	6	SMR CTA
15	Bio-Modular	6	Ascend Flex	5	Aequalis	3	Delta Xtend	5	Mutars
13	Solar	6	SMR	5	Ascend Flex	3	Equinoxe	3	SMR
8	Global AP	5	Mutars	5	Global Unite	2	Aequalis	2	Aequalis
6	Univers 3D	4	Mets	3	Delta Xtend	2	Affinis	2	Affinis
10 Most Used									
605	(10) 98.2%	203	(10) 97.6%	167	(10) 97.1%	182	(10) 98.4%	243	(10) 98.8%
Remainder									
11	(4) 1.8%	5	(3) 2.4%	5	(3) 2.9%	3	(2) 1.6%	3	(2) 1.2%
TOTAL									
616	(14) 100.0%	208	(13) 100.0%	172	(13) 100.0%	185	(12) 100.0%	246	(12) 100.0%

Table SPS26 10 Most Used Humeral Stem Prostheses in Primary Hemi Stemmed Anatomic Shoulder Replacement

2008		2021		2022		2023		2024	
N	Model	N	Model	N	Model	N	Model	N	Model
207	SMR	127	Ascend Flex	106	Ascend Flex	127	Ascend Flex	184	Ascend Flex
138	Global FX	15	Comprehensive	14	Equinoxe	14	Comprehensive	18	Comprehensive
98	Aequalis	15	Equinoxe	12	SMR	11	SMR	11	Global Unite
81	Global Advantage	15	SMR	10	Comprehensive	8	Global Unite	9	SMR
26	Bigliani/Flatow TM	8	Aequalis Flex Revive	8	Mutars	6	Aequalis Flex Revive	6	Aequalis Flex Revive
13	Solar	6	Aequalis	5	Aequalis	6	Mutars	6	Equinoxe
11	Bigliani/Flatow	6	Global Unite	4	Aequalis Flex Revive	4	Global AP	5	Mutars
11	Bio-Modular	5	Mutars	4	Global AP	3	Equinoxe	2	Aequalis
8	Global AP	4	Mets	4	Global Unite	2	Aequalis	2	Affinis
6	Univers 3D	3	Affinis	2	Affinis	2	Affinis	2	AltiVate Reverse
10 Most Used									
599 (10)	97.2%	204 (10)	98.1%	169 (10)	98.3%	183 (10)	98.9%	245 (10)	99.6%
Remainder									
17 (7)	2.8%	4 (2)	1.9%	3 (2)	1.7%	2 (1)	1.1%	1 (1)	0.4%
TOTAL									
616 (17)	100.0%	208 (12)	100.0%	172 (12)	100.0%	185 (11)	100.0%	246 (11)	100.0%

OUTCOME FOR ALL DIAGNOSES

Primary Diagnosis

Primary hemi stemmed anatomic shoulder replacement performed for fracture has a higher rate of revision than when performed for osteoarthritis in the first 2.5 years. After this time there is no difference (Table SPS27 and Figure SPS7).

Reason for Revision

Reasons for revision vary depending on the primary diagnosis. Revision for rotator cuff insufficiency occurs more frequently in hemi stemmed anatomic shoulder replacement undertaken for fracture (26.8%), whereas revision for glenoid erosion occurs more frequently in procedures undertaken for osteoarthritis (28.8%) (Table SPS28 and Figure SPS8).

Type of Revision

The most common type of revision is to a total shoulder replacement for both common primary diagnoses (72.7% for fracture and 62.2% for osteoarthritis) (Table SPS29). Most are revised to a total reverse shoulder replacement (98.1% when used for fracture and 87.6% for osteoarthritis). Glenoid component only revision occurs more commonly in procedures undertaken for osteoarthritis (23.1% compared to 4.6% for fracture).

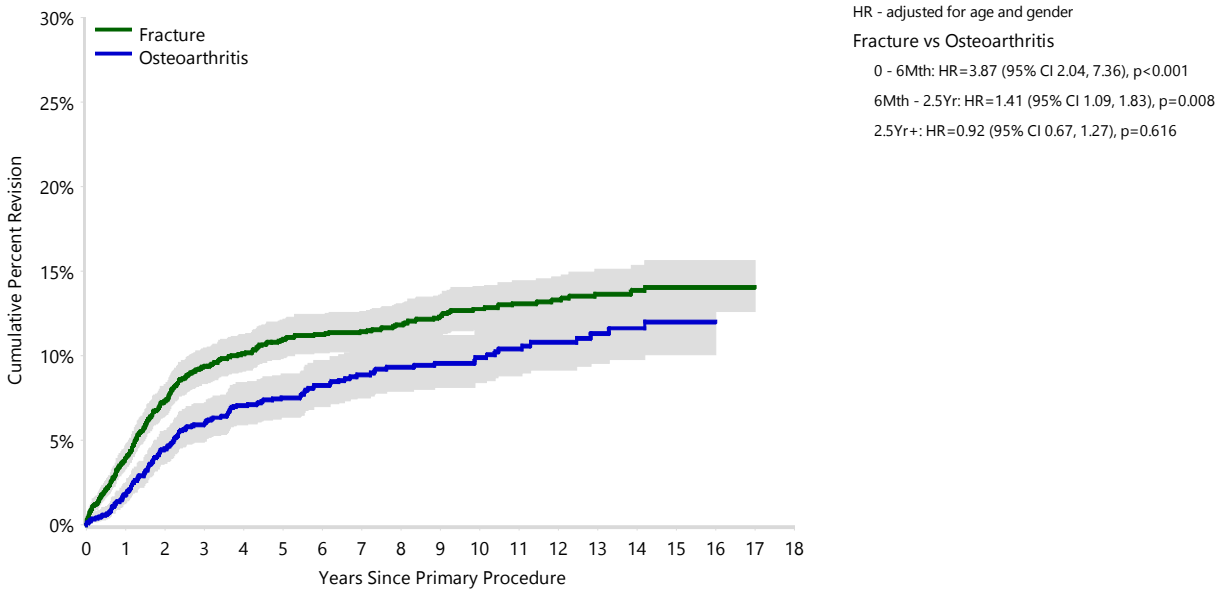
There is no difference in the rate of revision when primary hemi stemmed anatomic shoulder replacement is performed for fracture or osteoarthritis after the first 2.5 years.

Table SPS27 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis

Primary Diagnosis	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture	366	3213	4.0 (3.3, 4.7)	9.4 (8.4, 10.5)	11.0 (9.9, 12.1)	11.4 (10.3, 12.6)	12.8 (11.5, 14.1)	13.8 (12.5, 15.4)
Osteoarthritis	156	1986	1.8 (1.3, 2.5)	5.9 (4.9, 7.2)	7.5 (6.4, 8.9)	8.9 (7.5, 10.4)	9.9 (8.4, 11.6)	11.6 (9.8, 13.8)
Rotator Cuff Arthropathy	22	273	3.0 (1.5, 5.9)	5.8 (3.6, 9.5)	7.3 (4.6, 11.3)	7.3 (4.6, 11.3)	9.9 (6.4, 15.3)	
Osteonecrosis	22	249	2.1 (0.9, 5.0)	6.0 (3.5, 10.2)	7.8 (4.8, 12.5)	10.0 (6.4, 15.3)	12.1 (7.8, 18.4)	
Tumour	21	210	4.3 (2.1, 8.9)	10.2 (5.7, 17.9)	17.6 (10.6, 28.5)			
Rheumatoid Arthritis	10	105	1.0 (0.1, 6.8)	5.1 (2.2, 11.8)	6.2 (2.8, 13.2)	7.6 (3.7, 15.3)	13.3 (7.2, 24.1)	
Other (3)	12	122	5.1 (2.3, 11.1)	8.1 (4.3, 15.1)	8.1 (4.3, 15.1)	8.1 (4.3, 15.1)		
TOTAL	**609**	**6158**						

Note: Only primary diagnoses with >100 procedures have been listed

Figure SPS7 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis



Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture	3213	2933	2459	2079	1732	1201	423
Osteoarthritis	1986	1761	1411	1109	854	563	250

Note: Only primary diagnoses with >1,000 procedures have been listed

Table SPS28 Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis and Revision Diagnosis

Revision Diagnosis	Fracture			Osteoarthritis		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Rotator Cuff Insufficiency	98	3.1	26.8	24	1.2	15.4
Instability/Dislocation	68	2.1	18.6	30	1.5	19.2
Glenoid Erosion	25	0.8	6.8	45	2.3	28.8
Infection	39	1.2	10.7	13	0.7	8.3
Loosening	36	1.1	9.8	10	0.5	6.4
Fracture	34	1.1	9.3	6	0.3	3.8
Pain	30	0.9	8.2	18	0.9	11.5
Arthrofibrosis	7	0.2	1.9	3	0.2	1.9
Dissociation	7	0.2	1.9	1	0.1	0.6
Malposition	7	0.2	1.9	1	0.1	0.6
Lysis	5	0.2	1.4			
Incorrect Sizing	2	0.1	0.5	3	0.2	1.9
Heterotopic Bone	1	0.0	0.3			
Implant Breakage Glenoid	1	0.0	0.3			
Osteonecrosis				1	0.1	0.6
Other	6	0.2	1.6	1	0.1	0.6
N Revision	**366**	**11.4**	**100.0**	**156**	**7.9**	**100.0**
N Primary	**3213**			**1986**		

Figure SPS8 Cumulative Incidence Revision Diagnosis of Primary Hemi Stemmed Anatomic Shoulder by Primary Diagnosis

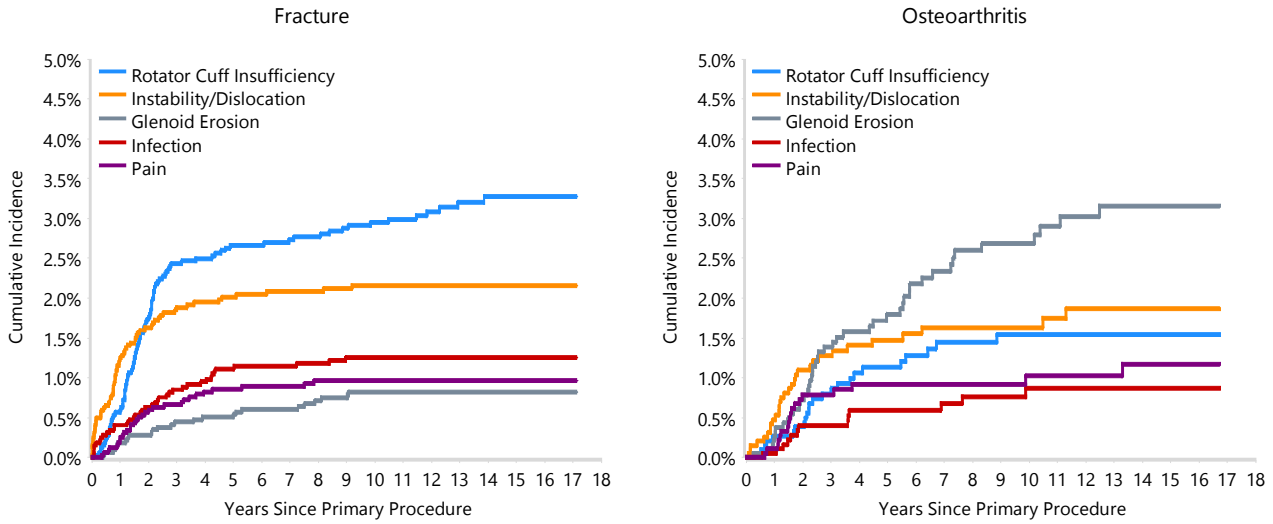


Table SPS29 Primary Hemi Stemmed Anatomic Shoulder Replacement by Primary Diagnosis and Type of Revision

Type of Revision	Fracture			Osteoarthritis		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Humeral/Glenoid	266	8.3	72.7	97	4.9	62.2
Glenoid Component	17	0.5	4.6	36	1.8	23.1
Humeral Component	31	1.0	8.5	8	0.4	5.1
Cement Spacer	20	0.6	5.5	5	0.3	3.2
Head Only	17	0.5	4.6	3	0.2	1.9
Removal of Prostheses	9	0.3	2.5	1	0.1	0.6
Cement Only	4	0.1	1.1			
Reoperation	2	0.1	0.5	4	0.2	2.6
Head/Insert				1	0.1	0.6
Minor Components				1	0.1	0.6
N Revision	**366**	**11.4**	**100.0**	**156**	**7.9**	**100.0**
N Primary	**3213**			**1986**		

OUTCOME FOR FRACTURE

Age and Gender

The rate of revision is lower for patients aged ≥75 years compared to all other age groups (Table SPS30 and Figure SPS9). Gender is not a risk factor for revision (Table SPS31 and Figure SPS10).

Cemented fixation has a lower rate of revision than cementless fixation when a non-fracture stem is used.

Humeral Stem

There is no difference in the rate of revision for fracture humeral stems compared to non-fracture humeral stems (Table SPS32 and Figure SPS11).

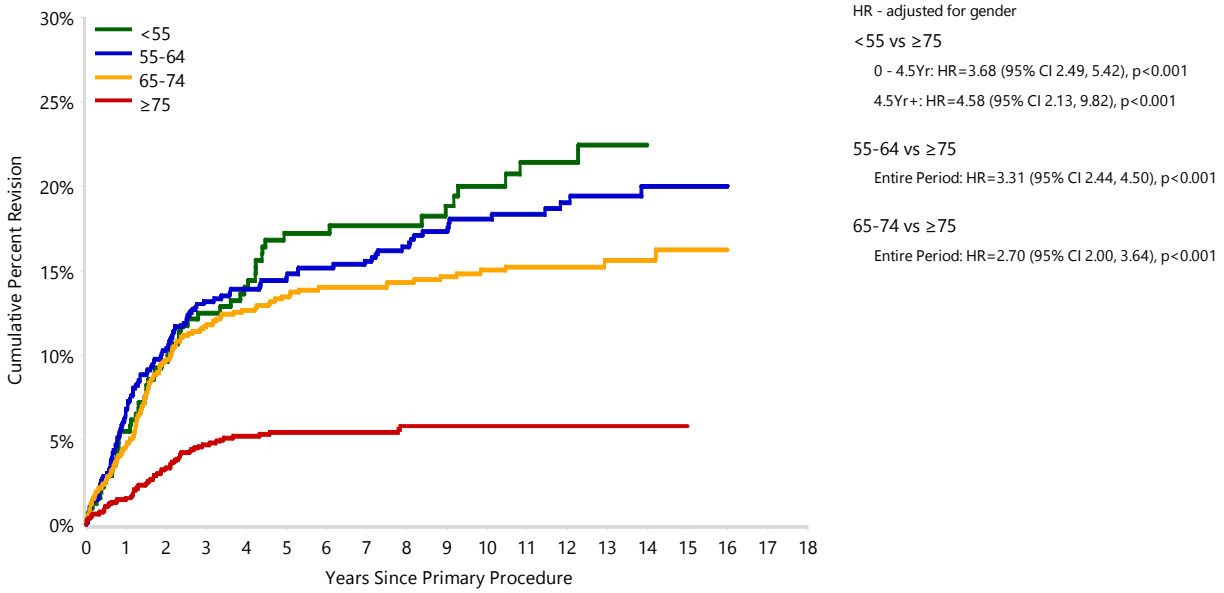
The use of cement for stem fixation in non-fracture hemiarthroplasty has a lower rate of revision than when a cementless non-fracture stem is used (Table SPS33 and Figure SPS12).

The outcomes for the most used prosthesis combinations for the treatment of fracture are listed in Table SPS34. The outcomes for individual fracture stems are presented separately in Table SPS35 and for non-fracture humeral stems in Table SPS36.

Table SPS30 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Age (Primary Diagnosis Fracture)

Age	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	57	315	5.5 (3.5, 8.7)	12.5 (9.2, 16.9)	17.2 (13.3, 22.2)	17.7 (13.7, 22.7)	20.0 (15.6, 25.5)	22.4 (17.5, 28.5)
55-64	114	670	6.8 (5.2, 9.1)	13.2 (10.8, 16.1)	14.6 (12.1, 17.6)	15.6 (13.0, 18.7)	18.1 (15.2, 21.4)	20.0 (16.8, 23.8)
65-74	130	916	4.6 (3.5, 6.2)	11.8 (9.9, 14.1)	13.5 (11.4, 15.9)	14.0 (11.9, 16.5)	15.0 (12.8, 17.7)	15.6 (13.3, 18.4)
≥75	65	1312	1.6 (1.0, 2.4)	4.7 (3.7, 6.1)	5.5 (4.3, 7.0)	5.5 (4.3, 7.0)	5.8 (4.6, 7.4)	5.8 (4.6, 7.4)
TOTAL	366	3213						

Figure SPS9 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Age (Primary Diagnosis Fracture)

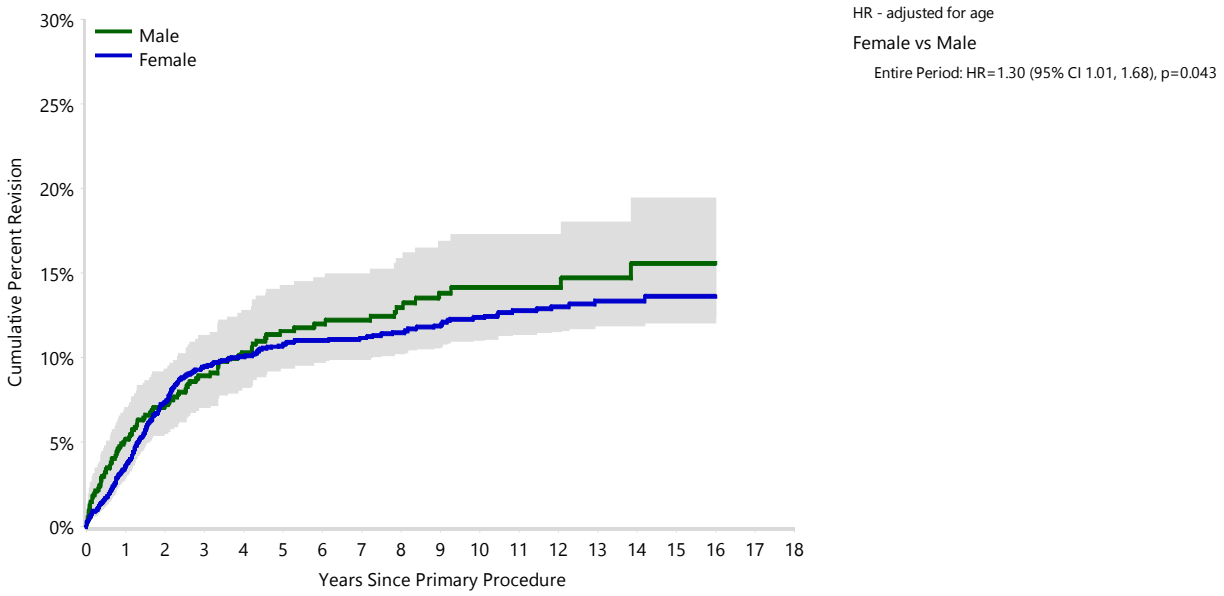


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	315	283	238	196	170	124	51
55-64	670	606	518	464	403	300	131
65-74	916	844	722	642	570	431	151
≥75	1312	1200	981	777	589	346	90

Table SPS31 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Gender (Primary Diagnosis Fracture)

Gender	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	90	755	5.2 (3.8, 7.0)	8.9 (7.0, 11.3)	11.6 (9.4, 14.3)	12.2 (9.9, 15.0)	14.1 (11.5, 17.3)	15.6 (12.5, 19.4)
Female	276	2458	3.6 (2.9, 4.4)	9.5 (8.4, 10.8)	10.8 (9.6, 12.1)	11.2 (9.9, 12.6)	12.4 (11.0, 13.9)	13.4 (11.9, 15.0)
TOTAL	**366**	**3213**						

Figure SPS10 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Gender (Primary Diagnosis Fracture)

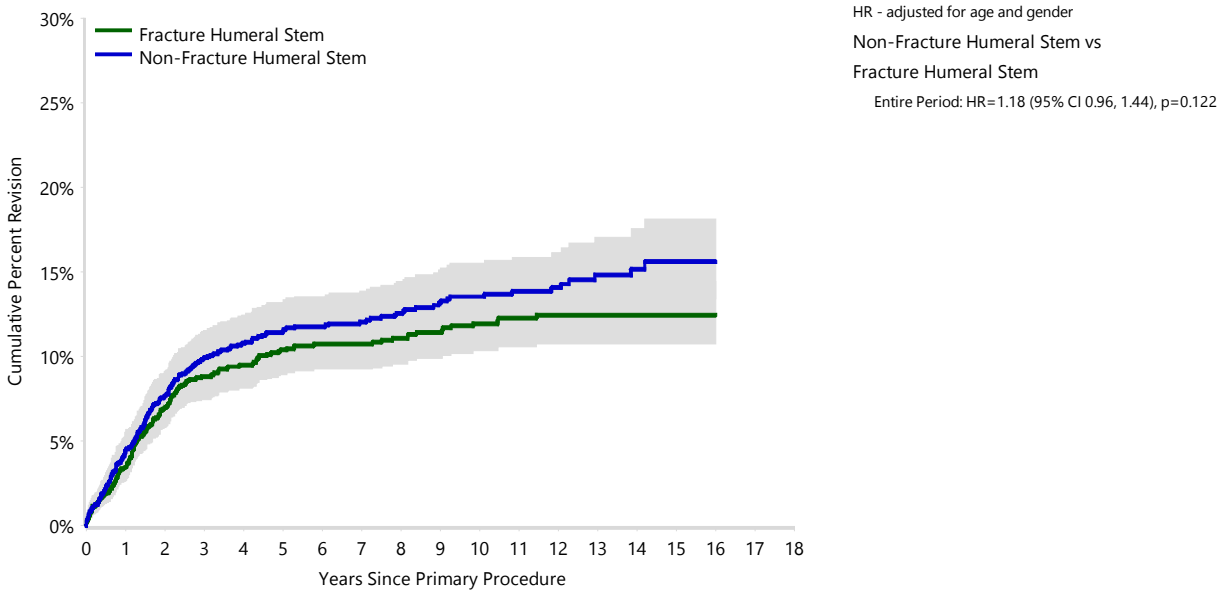


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	755	669	562	452	366	248	88
Female	2458	2264	1897	1627	1366	953	335

Table SPS32 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Stem Type (Primary Diagnosis Fracture)

Stem Type	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture Humeral Stem	170	1598	3.4 (2.7, 4.5)	8.8 (7.5, 10.4)	10.4 (8.9, 12.1)	10.8 (9.3, 12.5)	12.0 (10.3, 13.8)	12.5 (10.8, 14.4)
Non-Fracture Humeral Stem	196	1615	4.5 (3.6, 5.6)	9.9 (8.5, 11.6)	11.5 (10.0, 13.3)	12.1 (10.5, 13.9)	13.6 (11.8, 15.5)	15.2 (13.1, 17.6)
TOTAL	366	3213						

Figure SPS11 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Stem Type (Primary Diagnosis Fracture)

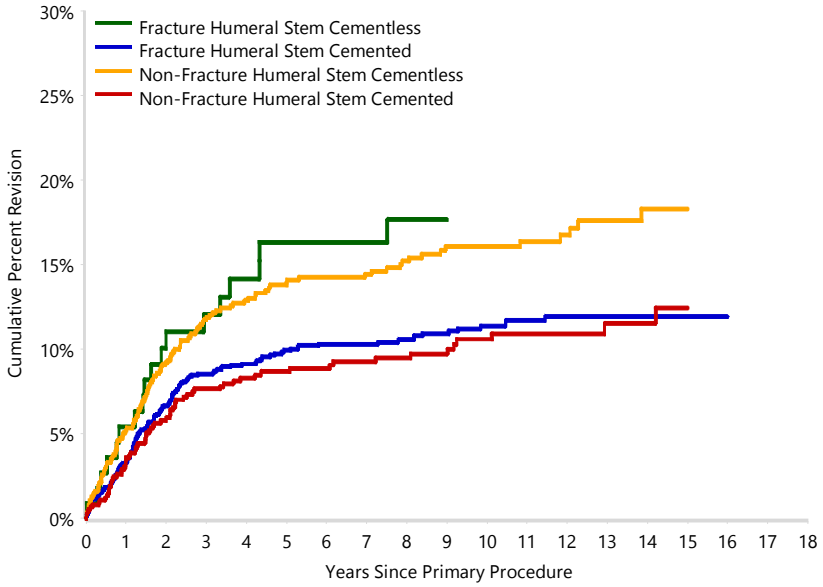


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture Humeral Stem	1598	1476	1248	1047	854	599	209
Non-Fracture Humeral Stem	1615	1457	1211	1032	878	602	214

Table SPS33 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Stem Type and Humeral Fixation (Primary Diagnosis Fracture)

Stem Type	Humeral Fixation	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture Humeral Stem	Cementless	19	112	5.4 (2.5, 11.7)	12.1 (7.2, 19.9)	16.3 (10.5, 25.0)	16.3 (10.5, 25.0)		
	Cemented	151	1486	3.3 (2.5, 4.4)	8.6 (7.2, 10.1)	9.9 (8.5, 11.7)	10.3 (8.8, 12.1)	11.4 (9.7, 13.3)	11.9 (10.2, 13.9)
Non-Fracture Humeral Stem	Cementless	126	865	5.2 (3.9, 6.9)	11.9 (9.8, 14.3)	13.9 (11.7, 16.6)	14.4 (12.1, 17.1)	16.1 (13.6, 19.0)	18.3 (15.3, 21.9)
	Cemented	70	750	3.6 (2.5, 5.3)	7.7 (5.9, 9.9)	8.7 (6.8, 11.1)	9.3 (7.3, 11.8)	10.6 (8.4, 13.4)	11.5 (9.0, 14.7)
TOTAL		**366**	**3213**						

Figure SPS12 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Stem Type and Humeral Fixation (Primary Diagnosis Fracture)



HR - adjusted for age and gender

Fracture Humeral Stem Cementless vs Fracture Humeral Stem Cemented
Entire Period: HR=1.36 (95% CI 0.84, 2.20), p=0.205

Fracture Humeral Stem Cementless vs Non-Fracture Humeral Stem Cementless
Entire Period: HR=0.96 (95% CI 0.59, 1.56), p=0.878

Fracture Humeral Stem Cemented vs Non-Fracture Humeral Stem Cemented
Entire Period: HR=1.04 (95% CI 0.78, 1.38), p=0.787

Non-Fracture Humeral Stem Cementless vs Non-Fracture Humeral Stem Cemented
Entire Period: HR=1.47 (95% CI 1.10, 1.97), p=0.009

Number at Risk		0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Fracture Humeral Stem	Cementless	112	103	85	74	65	34	6
	Cemented	1486	1373	1163	973	789	565	203
Non-Fracture Humeral Stem	Cementless	865	779	636	555	469	324	109
	Cemented	750	678	575	477	409	278	105

Table SPS34 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Humeral Head and Humeral Stem (Primary Diagnosis Fracture)

Humeral Head	Humeral Stem	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Aequalis	Aequalis	42	474	3.0 (1.8, 5.0)	7.3 (5.2, 10.1)	8.1 (5.9, 11.0)	8.4 (6.1, 11.4)	9.1 (6.7, 12.3)	10.7 (7.8, 14.4)
Affinis	Affinis	7	51	6.1 (2.0, 17.9)	12.9 (6.0, 26.6)	15.5 (7.7, 29.9)	15.5 (7.7, 29.9)	15.5 (7.7, 29.9)	
Ascend Flex PyC	Ascend Flex	4	47	7.3 (2.4, 20.9)	11.1 (4.2, 27.7)	11.1 (4.2, 27.7)			
Bigliani/Flatow	Bigliani/Flatow TM	13	293	1.4 (0.5, 3.7)	3.6 (2.0, 6.6)	3.6 (2.0, 6.6)	4.1 (2.3, 7.3)	5.3 (3.1, 9.1)	5.3 (3.1, 9.1)
Bio-Modular	Comprehensive	7	79	2.6 (0.6, 9.9)	7.9 (3.6, 16.7)	9.3 (4.6, 18.6)	9.3 (4.6, 18.6)	9.3 (4.6, 18.6)	
Comprehensive	Comprehensive	10	106	4.9 (2.1, 11.3)	10.4 (5.7, 18.5)	10.4 (5.7, 18.5)			
Equinoxe	Equinoxe	6	39	8.0 (2.7, 22.9)	13.6 (5.9, 29.7)	20.3 (8.8, 42.6)			
Global Advantage	Global Advantage	10	53	7.7 (2.9, 19.1)	15.7 (8.1, 28.9)	17.8 (9.7, 31.4)	17.8 (9.7, 31.4)	17.8 (9.7, 31.4)	21.2 (11.8, 36.4)
	Global FX	60	695	2.2 (1.3, 3.6)	6.3 (4.6, 8.4)	7.9 (6.0, 10.3)	8.5 (6.5, 11.0)	10.0 (7.8, 12.8)	10.4 (8.1, 13.3)
Global Unite	Global Unite	40	178	8.5 (5.2, 13.7)	19.4 (14.2, 26.2)	22.8 (17.1, 30.0)	22.8 (17.1, 30.0)		
SMR	SMR	127	904	4.2 (3.1, 5.7)	11.0 (9.0, 13.3)	13.0 (10.9, 15.5)	13.8 (11.6, 16.3)	15.7 (13.3, 18.5)	17.2 (14.3, 20.5)
SMR CTA	SMR	7	46	9.3 (3.6, 22.8)	15.4 (7.2, 31.5)	19.5 (9.5, 37.4)	19.5 (9.5, 37.4)	19.5 (9.5, 37.4)	
Solar	Solar	5	40	7.9 (2.6, 22.5)	10.5 (4.1, 25.7)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)
Other (27)		28	208	5.9 (3.4, 10.2)	12.1 (8.2, 17.7)	13.4 (9.3, 19.3)	13.4 (9.3, 19.3)	14.3 (9.9, 20.4)	
TOTAL		366	3213						

Note: Only combinations with >30 procedures have been listed

Table SPS35 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Humeral Head and Fracture Stem (Primary Diagnosis Fracture)

Humeral Head	Fracture Stem	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Aequalis	Aequalis	40	455	2.9 (1.7, 4.9)	7.4 (5.3, 10.3)	8.2 (6.0, 11.2)	8.5 (6.2, 11.6)	9.3 (6.8, 12.6)	10.2 (7.5, 13.8)
Affinis	Affinis	7	48	6.5 (2.2, 18.9)	13.7 (6.4, 28.2)	16.4 (8.2, 31.6)	16.4 (8.2, 31.6)	16.4 (8.2, 31.6)	
Bio-Modular	Comprehensive	7	79	2.6 (0.6, 9.9)	7.9 (3.6, 16.7)	9.3 (4.6, 18.6)	9.3 (4.6, 18.6)	9.3 (4.6, 18.6)	
Comprehensive	Comprehensive	10	89	5.8 (2.5, 13.4)	12.0 (6.7, 21.3)	12.0 (6.7, 21.3)	12.0 (6.7, 21.3)	12.0 (6.7, 21.3)	
Equinoxe	Equinoxe	4	31	3.4 (0.5, 22.1)	10.6 (3.5, 29.5)	19.6 (6.9, 48.5)			
Global Advantage	Global FX	60	695	2.2 (1.3, 3.6)	6.3 (4.6, 8.4)	7.9 (6.0, 10.3)	8.5 (6.5, 11.0)	10.0 (7.8, 12.8)	10.4 (8.1, 13.3)
Global Unite	Global Unite	40	176	8.6 (5.3, 13.9)	19.6 (14.4, 26.5)	23.0 (17.3, 30.3)	23.0 (17.3, 30.3)		
Other (4)		2	25	0.0 (0.0, 0.0)	9.1 (2.4, 31.9)	9.1 (2.4, 31.9)	9.1 (2.4, 31.9)	9.1 (2.4, 31.9)	9.1 (2.4, 31.9)
TOTAL		170	1598						

Note: Only combinations with >30 procedures have been listed

Table SPS36 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Humeral Head and Non-Fracture Stem (Primary Diagnosis Fracture)

Humeral Head	Non Fracture Humeral Stem	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Ascend Flex PyC	Ascend Flex	4	47	7.3 (2.4, 20.9)	11.1 (4.2, 27.7)	11.1 (4.2, 27.7)			
Bigliani/Flatow	Bigliani/Flatow TM	13	293	1.4 (0.5, 3.7)	3.6 (2.0, 6.6)	3.6 (2.0, 6.6)	4.1 (2.3, 7.3)	5.3 (3.1, 9.1)	5.3 (3.1, 9.1)
Global Advantage	Global Advantage	10	53	7.7 (2.9, 19.1)	15.7 (8.1, 28.9)	17.8 (9.7, 31.4)	17.8 (9.7, 31.4)	17.8 (9.7, 31.4)	21.2 (11.8, 36.4)
SMR	SMR	127	904	4.2 (3.1, 5.7)	11.0 (9.0, 13.3)	13.0 (10.9, 15.5)	13.8 (11.6, 16.3)	15.7 (13.3, 18.5)	17.2 (14.3, 20.5)
SMR CTA	SMR	7	46	9.3 (3.6, 22.8)	15.4 (7.2, 31.5)	19.5 (9.5, 37.4)	19.5 (9.5, 37.4)	19.5 (9.5, 37.4)	
Solar	Solar	5	40	7.9 (2.6, 22.5)	10.5 (4.1, 25.7)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)	13.7 (5.9, 30.0)
Other (29)		30	232	6.6 (4.1, 10.8)	11.3 (7.7, 16.4)	12.5 (8.7, 17.9)	12.5 (8.7, 17.9)	13.3 (9.2, 18.9)	
TOTAL		**196**	**1615**						

Note: Only combinations with >30 procedures have been listed

OUTCOME FOR OSTEOARTHRITIS

Age and Gender

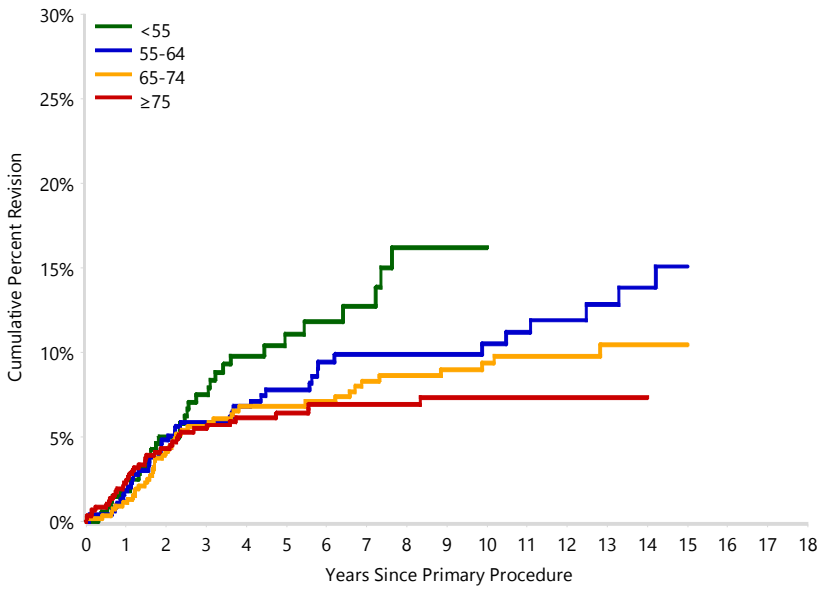
The rate of revision is lower for patients aged ≥75 years compared to patients aged <55 years after 2.5 years, and when compared to the 55-64 year age group after 6 years. There is no difference in the rate of revision when patients aged ≥75 years and 65-74 years are compared (Table SPS37 and Figure SPS13).

Gender is not a risk factor for revision (Table SPS38 and Figure SPS14).
The outcomes of the most used prosthesis combinations for osteoarthritis are listed in Table SPS39.

Table SPS37 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Age (Primary Diagnosis OA)

Age	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	35	371	1.8 (0.8, 4.0)	7.5 (4.9, 11.3)	11.1 (7.7, 15.8)	12.7 (8.9, 18.1)	16.2 (11.3, 23.0)	
55-64	41	483	1.8 (0.9, 3.6)	5.9 (4.0, 8.7)	7.8 (5.5, 11.0)	9.9 (7.1, 13.6)	10.5 (7.6, 14.5)	13.8 (9.9, 19.2)
65-74	43	548	1.1 (0.5, 2.5)	5.6 (3.9, 8.1)	6.8 (4.9, 9.5)	8.3 (6.1, 11.3)	9.4 (6.9, 12.6)	10.5 (7.7, 14.1)
≥75	37	584	2.5 (1.5, 4.1)	5.5 (3.9, 7.8)	6.4 (4.6, 8.9)	6.9 (5.0, 9.5)	7.4 (5.3, 10.1)	7.4 (5.3, 10.1)
TOTAL	**156**	**1986**						

Figure SPS13 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Age (Primary Diagnosis OA)



HR - adjusted for gender

<55 vs ≥75

0 - 2.5Yr: HR=1.55 (95% CI 0.85, 2.86), p=0.155

2.5Yr+: HR=4.88 (95% CI 2.50, 9.51), p<0.001

55-64 vs ≥75

0 - 1.5Yr: HR=1.22 (95% CI 0.61, 2.43), p=0.566

1.5Yr - 6Yr: HR=1.94 (95% CI 1.08, 3.50), p=0.026

6Yr+: HR=2.21 (95% CI 0.85, 5.76), p=0.103

65-74 vs ≥75

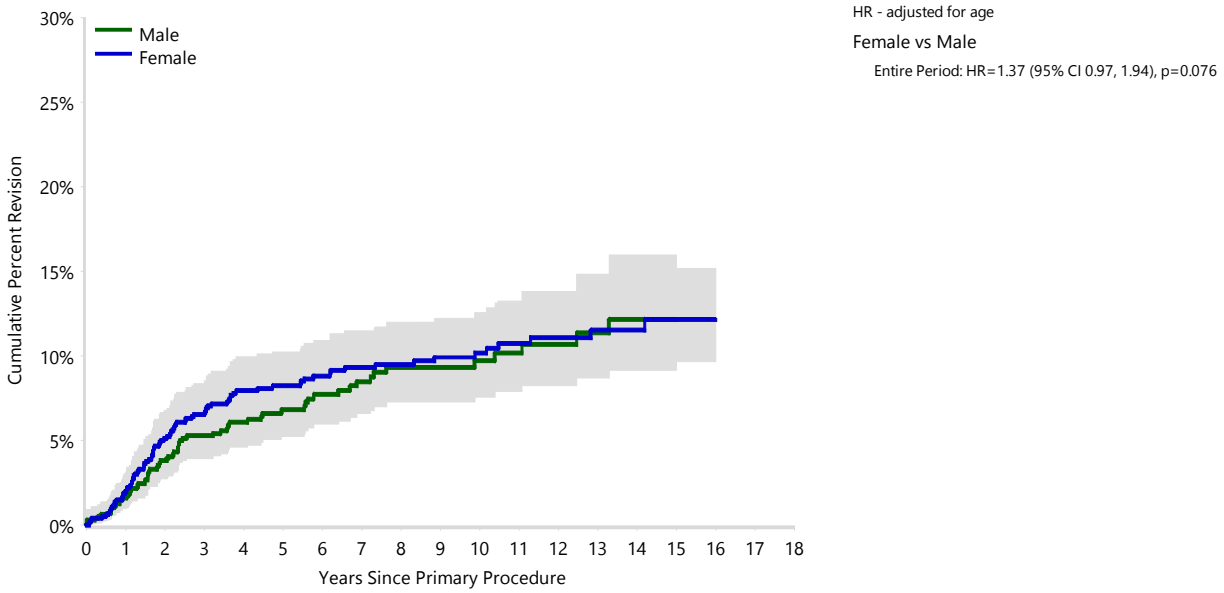
Entire Period: HR=1.25 (95% CI 0.80, 1.95), p=0.320

Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
<55	371	299	213	133	85	49	20
55-64	483	413	328	248	187	140	77
65-74	548	510	418	344	297	221	112
≥75	584	539	452	384	285	153	41

Table SPS38 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Gender (Primary Diagnosis OA)

Gender	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	68	1004	1.6 (1.0, 2.7)	5.3 (3.9, 7.0)	6.8 (5.2, 8.9)	8.5 (6.6, 10.9)	9.7 (7.6, 12.5)	12.1 (9.2, 16.0)
Female	88	982	2.0 (1.3, 3.1)	6.6 (5.1, 8.4)	8.2 (6.6, 10.3)	9.3 (7.5, 11.5)	10.2 (8.2, 12.5)	11.5 (9.3, 14.3)
TOTAL	156	1986						

Figure SPS14 Cumulative Percent Revision of Primary Hemi Stemmed Shoulder Replacement by Gender (Primary Diagnosis OA)



Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Male	1004	857	651	461	338	225	95
Female	982	904	760	648	516	338	155

Table SPS39 Cumulative Percent Revision of Primary Hemi Stemmed Anatomic Shoulder Replacement by Humeral Head and Humeral Stem (Primary Diagnosis OA)

Humeral Head	Humeral Stem	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	14 Yrs
Aequalis	Aequalis	11	140	1.4 (0.4, 5.6)	5.1 (2.5, 10.5)	6.0 (3.0, 11.6)	8.8 (4.9, 15.3)	8.8 (4.9, 15.3)	8.8 (4.9, 15.3)
Ascend Flex	Ascend Flex	0	24	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)		
Ascend Flex PyC	Ascend Flex	20	703	0.5 (0.2, 1.5)	2.8 (1.6, 4.7)	4.6 (2.9, 7.4)	5.4 (3.3, 8.9)		
Bigliani/Flatow	Bigliani/Flatow TM	5	53	3.8 (1.0, 14.3)	7.5 (2.9, 18.9)	7.5 (2.9, 18.9)	10.0 (4.3, 22.6)	10.0 (4.3, 22.6)	10.0 (4.3, 22.6)
Comprehensive	Comprehensive	3	38	0.0 (0.0, 0.0)	8.7 (2.2, 30.5)	8.7 (2.2, 30.5)	15.2 (5.0, 41.1)	15.2 (5.0, 41.1)	
Delta Xtend	Delta Xtend	3	33	3.0 (0.4, 19.6)	9.9 (3.3, 27.7)	9.9 (3.3, 27.7)	9.9 (3.3, 27.7)	9.9 (3.3, 27.7)	
Equinoxe	Equinoxe	4	20	5.3 (0.8, 31.9)	23.3 (9.4, 51.2)	23.3 (9.4, 51.2)			
Global AP	Global AP	12	168	0.6 (0.1, 4.1)	4.2 (2.0, 8.6)	6.1 (3.3, 11.0)	6.8 (3.8, 11.9)	6.8 (3.8, 11.9)	
Global AP CTA	Global AP	5	50	2.0 (0.3, 13.4)	10.2 (4.4, 22.8)	10.2 (4.4, 22.8)	10.2 (4.4, 22.8)	10.2 (4.4, 22.8)	
Global Advantage	Global Advantage	17	144	0.7 (0.1, 4.8)	5.0 (2.4, 10.2)	7.3 (4.0, 13.1)	8.1 (4.6, 14.1)	10.9 (6.6, 17.8)	14.3 (9.1, 22.3)
	Global FX	4	31	3.2 (0.5, 20.8)	10.0 (3.3, 28.1)	10.0 (3.3, 28.1)	10.0 (3.3, 28.1)	15.7 (5.9, 37.8)	
Global Advantage CTA	Global Advantage	1	39	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	3.8 (0.6, 24.3)	3.8 (0.6, 24.3)	3.8 (0.6, 24.3)
Global Unite	Global Unite	1	36	0.0 (0.0, 0.0)	4.0 (0.6, 25.2)	4.0 (0.6, 25.2)	4.0 (0.6, 25.2)		
SMR	SMR	47	278	4.0 (2.3, 7.2)	9.7 (6.7, 13.9)	13.3 (9.7, 18.0)	15.5 (11.6, 20.5)	17.0 (12.9, 22.3)	19.3 (14.6, 25.2)
SMR CTA	SMR	10	105	5.8 (2.7, 12.5)	10.1 (5.5, 17.9)	10.1 (5.5, 17.9)	10.1 (5.5, 17.9)		
Other (26)		13	124	3.3 (1.2, 8.5)	8.5 (4.6, 15.2)	9.5 (5.4, 16.5)	9.5 (5.4, 16.5)	11.5 (6.5, 20.0)	
TOTAL		**156**	**1986**						

Note: Only combinations with >20 procedures have been listed

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