

Australian Orthopaedic Association National Joint Replacement Registry

2023 SUPPLEMENTARY REPORT

Demographics of Spinal Disc Arthroplasty



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Australian Orthopaedic Association National Joint Replacement Registry

**Demographics of Spinal Disc Arthroplasty
2023 Supplementary Report**

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**2023 Demographics of Spinal Disc
Arthroplasty
Supplementary Report**

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

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Introduction

The 2023 Demographics of Spinal Disc Arthroplasty Supplementary Report is based on the analysis of 11,343 spinal disc procedures recorded by the Registry with a procedure date up to and including 31 December 2022.

This supplementary report provides summary data and demographic information on spinal disc replacement surgery.

Data are broken down into the five classes of spinal disc replacement: spinal segment, spinal ball trough, insert and endplate, cervical intervertebral disc and lumbar intervertebral disc. Revision rates are not provided for spinal disc replacement.

The Spinal Disc Arthroplasty Report is one of 16 supplementary reports to complete the AOANJRR Annual Report for 2023.

Information on the background, purpose, aims, benefits and governance of the Registry can be found in the Introductory chapter of the 2023 Hip, Knee and Shoulder Arthroplasty Annual Report.

The Registry data quality processes including data collection, validation and outcome assessment, are provided in detail in the Data Quality chapter of the 2023 Hip, Knee and Shoulder Arthroplasty Annual Report:

<https://aoanjrr.sahmri.com/annual-reports-2023>

Spinal Disc Replacement

Demographics of Spinal Disc Replacement

Table SD1 Number of Primary Spinal Disc Replacements by Gender

Spinal Disc Replacement	Male		Female		TOTAL	
	N	Total%	N	Total%	N	Total%
Spinal Segment	196	1.7	162	1.4	358	3.2
Spinal Ball Trough	1363	12.0	1277	11.3	2640	23.3
Insert & Endplates	323	2.8	184	1.6	507	4.5
Intervertebral Disc (Cervical)	2589	22.8	2162	19.1	4751	41.9
Intervertebral Disc (Lumbar)	1895	16.7	1192	10.5	3087	27.2
TOTAL	6366	56.1	4977	43.9	11343	100.0

Table SD2 Number of Primary Spinal Disc Replacements by Age

Spinal Disc Replacement	<55		55-64		65-74		75-84		≥85		TOTAL	
	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%
Spinal Segment	316	2.8	26	0.2	15	0.1	1	0.0	.	.	358	3.2
Spinal Ball Trough	2126	18.7	377	3.3	119	1.0	16	0.1	2	0.0	2640	23.3
Insert & Endplates	447	3.9	43	0.4	13	0.1	4	0.0	.	.	507	4.5
Intervertebral Disc (Cervical)	3825	33.7	745	6.6	170	1.5	11	0.1	.	.	4751	41.9
Intervertebral Disc (Lumbar)	2407	21.2	443	3.9	199	1.8	37	0.3	1	0.0	3087	27.2
TOTAL	9121	80.4	1634	14.4	516	4.5	69	0.6	3	0.0	11343	100.0

Table SD3 Number of Primary Spinal Disc Replacements by Year of Implant

Year of Implant	Spinal Segment		Spinal Ball Trough		Insert & Endplates		Intervertebral Disc (Cervical)		Intervertebral Disc (Lumbar)		TOTAL	
	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%
2007	1	0.0	4	0.0	1	0.0	.	.	1	0.0	7	0.1
2008	39	0.3	40	0.4	23	0.2	2	0.0	11	0.1	115	1.0
2009	36	0.3	31	0.3	27	0.2	3	0.0	4	0.0	101	0.9
2010	57	0.5	15	0.1	32	0.3	23	0.2	14	0.1	141	1.2
2011	51	0.4	14	0.1	30	0.3	33	0.3	14	0.1	142	1.3
2012	26	0.2	7	0.1	22	0.2	64	0.6	36	0.3	155	1.4
2013	30	0.3	116	1.0	44	0.4	139	1.2	52	0.5	381	3.4
2014	30	0.3	192	1.7	33	0.3	301	2.7	89	0.8	645	5.7
2015	18	0.2	257	2.3	25	0.2	403	3.6	265	2.3	968	8.5
2016	24	0.2	264	2.3	24	0.2	313	2.8	316	2.8	941	8.3
2017	21	0.2	338	3.0	21	0.2	514	4.5	415	3.7	1309	11.5
2018	13	0.1	384	3.4	22	0.2	556	4.9	381	3.4	1356	12.0
2019	4	0.0	297	2.6	25	0.2	683	6.0	458	4.0	1467	12.9
2020	.	.	278	2.5	32	0.3	618	5.4	436	3.8	1364	12.0
2021	2	0.0	214	1.9	25	0.2	658	5.8	389	3.4	1288	11.4
2022	6	0.1	189	1.7	121	1.1	441	3.9	206	1.8	963	8.5
TOTAL	358	3.2	2640	23.3	507	4.5	4751	41.9	3087	27.2	11343	100.0

Table SD4 Number of Primary Spinal Disc Replacements by Level

Spinal Disk Replacement	Spinal Segment		Spinal Ball Trough		Insert & Endplates		Intervertebral Disc (Cervical)		Intervertebral Disc (Lumbar)		TOTAL	
	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%	N	Total%
T12-L1	.	.	1	0.0	1	0.0	.	.	.	.	2	0.0
L1-L2	1	0.0	3	0.0	.	.	.	.	7	0.1	11	0.1
L2-L3	9	0.1	.	.	13	0.1	.	.	148	1.3	170	1.5
L3-L4	46	0.4	11	0.1	66	0.6	.	.	487	4.3	610	5.4
L4-L5	227	2.0	15	0.1	280	2.5	.	.	1677	14.8	2199	19.4
L5-S1	64	0.6	5	0.0	136	1.2	.	.	768	6.8	973	8.6
C2-C3	.	.	7	0.1	.	.	2	0.0	.	.	9	0.1
C3-C4	1	0.0	143	1.3	2	0.0	123	1.1	.	.	269	2.4
C4-C5	1	0.0	468	4.1	3	0.0	582	5.1	.	.	1054	9.3
C5-C6	7	0.1	1194	10.5	3	0.0	2207	19.5	.	.	3411	30.1
C6-C7	2	0.0	778	6.9	3	0.0	1783	15.7	.	.	2566	22.6
C7-T1	.	.	15	0.1	.	.	54	0.5	.	.	69	0.6
TOTAL	358	3.2	2640	23.3	507	4.5	4751	41.9	3087	27.2	11343	100.0

Primary Spinal Disc Replacement

Table SD5 Age and Gender of Primary Spinal Disc Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	4977	43.9%	15	87	45	45.5	10.7
Male	6366	56.1%	17	99	45	45.7	11.0
TOTAL	11343	100.0%	15	99	45	45.6	10.8

Figure SD1 Primary Spinal Disc Replacement by Age and Gender

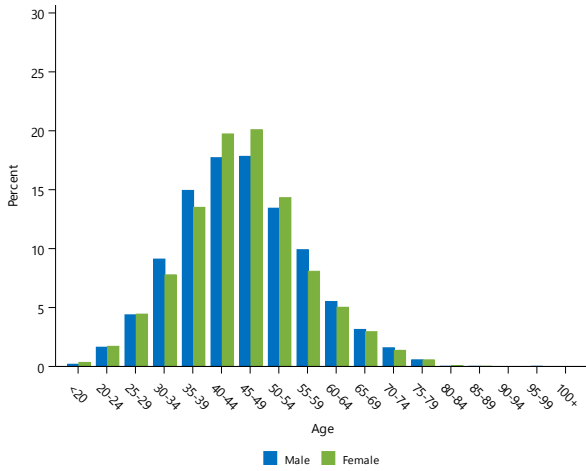


Table SD6 Primary Spinal Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	10001	88.2
Disc Disease Without Radiculopathy	946	8.3
Pain Of Unknown Cause	125	1.1
Spondylolisthesis	94	0.8
Adjacent To Concurrent Fusion	78	0.7
Post Laminectomy Or Discectomy	34	0.3
Adjacent Segment Syndrome	31	0.3
Other	34	0.3
TOTAL	11343	100.0

Primary Spinal Segment Replacement

Table SD7 Age and Gender of Primary Spinal Segment Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	162	45.3%	19	73	40	40.4	10.8
Male	196	54.7%	19	75	40	41.9	11.4
TOTAL	358	100.0%	19	75	40	41.2	11.1

Figure SD2 Primary Spinal Segment Replacement by Age and Gender

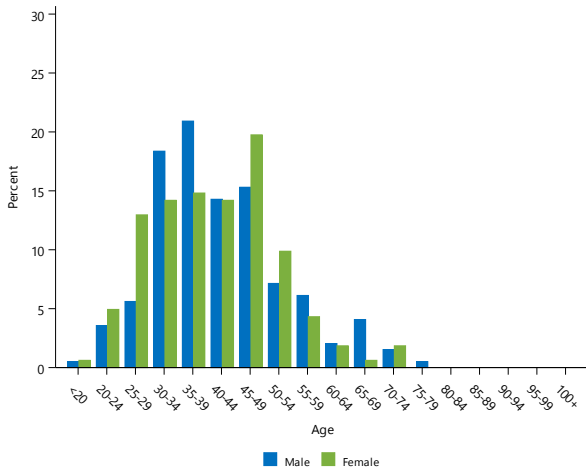


Table SD8 Primary Spinal Segment Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease Without Radiculopathy	183	51.1
Disc Disease With Radiculopathy	150	41.9
Adjacent To Concurrent Fusion	8	2.2
Pain Of Unknown Cause	7	2.0
Spondylolisthesis	5	1.4
Post Laminectomy Or Discectomy	1	0.3
Adjacent Segment Syndrome	1	0.3
Other	3	0.8
TOTAL	358	100.0

Table SD9 Most Used Segment Prostheses in Primary Spinal Segment Replacement

2008		2018		2019		2021		2022	
N	Model	N	Model	N	Model	N	Model	N	Model
39	Maverick	12	TDR	2	TDR	2	Verte-Stack	6	Verte-Stack
		1	Verte-Stack	2	Verte-Stack				
Most Used									
39	(1) 100.0	13	(2) 100.0	4	(2) 100.0	2	(1) 100.0	6	(1) 100.0

Note: There were no procedures recorded in 2020

Primary Spinal Ball Trough Replacement

Table SD10 Age and Gender of Primary Spinal Ball Trough Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	1277	48.4%	22	81	46	46.3	9.7
Male	1363	51.6%	21	99	46	46.5	10.5
TOTAL	2640	100.0%	21	99	46	46.4	10.1

Figure SD3 Primary Spinal Ball Trough Replacement by Age and Gender

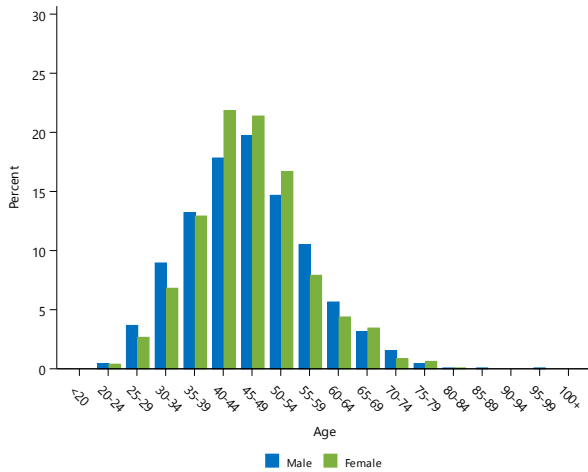


Table SD11 Primary Spinal Ball Trough Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	2417	91.6
Disc Disease Without Radiculopathy	134	5.1
Spondylolisthesis	24	0.9
Pain Of Unknown Cause	18	0.7
Adjacent Segment Syndrome	14	0.5
Adjacent To Concurrent Fusion	12	0.5
Post Laminectomy Or Discectomy	11	0.4
Other	10	0.4
TOTAL	2640	100.0

Table SD12 Most Used Ball Trough Prostheses in Primary Spinal Ball Trough Replacement

2008		2019		2020		2021		2022	
N	Model	N	Model	N	Model	N	Model	N	Model
30	Prestige	133	Prodisc-C	147	Prodisc-C	115	Prodisc-C	102	Prodisc-C
4	Wallis	120	Mobi-C	79	Mobi-C	71	Mobi-C	35	Mobi-C
3	Prodisc-C	38	Prestige	34	Prestige	28	Prestige	28	Prestige
3	X-Stop	6	Activ C	16	Activ C			17	Simplify Disc
				2	Secure-C			7	Secure-C
Most Used									
40	(4) 100.0%	297	(4) 100.0%	278	(5) 100.0%	214	(3) 100.0%	189	(5) 100.0%

Primary Spinal Insert/Endplate Replacement

Table SD13 Age and Gender of Primary Spinal Insert/Endplate Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	184	36.3%	20	78	42	42.2	11.4
Male	323	63.7%	20	78	42	42.1	10.7
TOTAL	507	100.0%	20	78	42	42.1	11.0

Figure SD4 Primary Spinal Insert/Endplate Replacement by Age and Gender

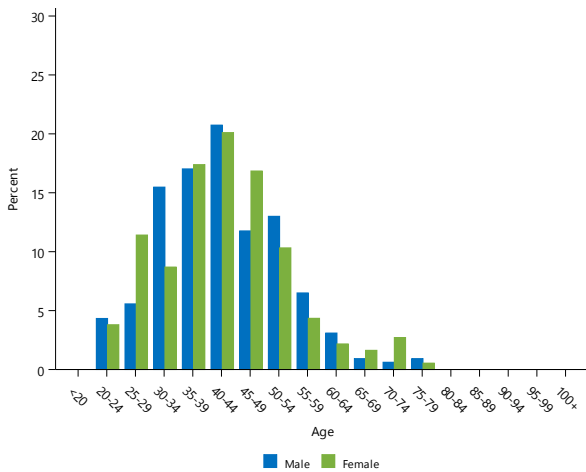


Table SD14 Primary Spinal Insert/Endplate Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	356	70.2
Disc Disease Without Radiculopathy	91	17.9
Pain Of Unknown Cause	37	7.3
Spondylolisthesis	11	2.2
Adjacent To Concurrent Fusion	6	1.2
Adjacent Segment Syndrome	2	0.4
Post Laminectomy Or Discectomy	2	0.4
Other	2	0.4
TOTAL	507	100.0

Table SD15 Most Used Insert Prostheses in Primary Spinal Insert/Endplate Replacement

2008		2019		2020		2021		2022	
N	Model	N	Model	N	Model	N	Model	N	Model
16	Prodisc	19	Activ L	30	Activ L	21	Activ L	104	Activ L
7	In Motion	6	Prodisc	1	Orbit-R	4	Prodisc	17	Prodisc
				1	Prodisc				
Most Used									
23	(2) 100	25	(2) 100	32	(3) 100	25	(2) 100	121	(2) 100

Primary Cervical Intervertebral Disc Replacement

Table SD16 Age and Gender of Primary Cervical Intervertebral Disc Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	2162	45.5%	15	78	46	46.3	9.5
Male	2589	54.5%	19	78	46	46.3	9.9
TOTAL	4751	100.0%	15	78	46	46.3	9.7

Figure SD5 Primary Cervical Intervertebral Disc Replacement by Age and Gender

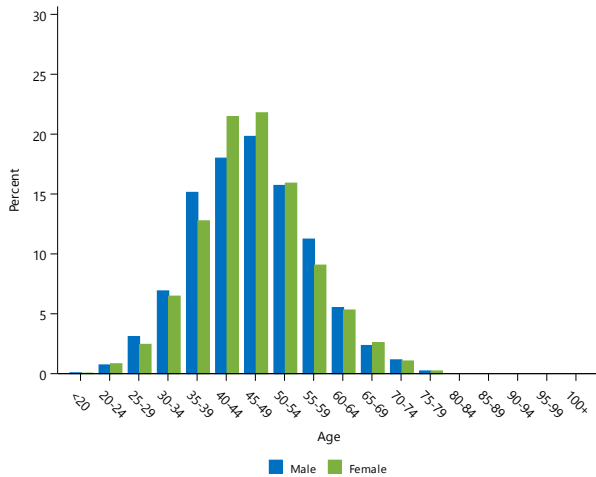


Table SD17 Primary Cervical Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	4414	92.9
Disc Disease Without Radiculopathy	204	4.3
Pain Of Unknown Cause	35	0.7
Spondylolisthesis	35	0.7
Adjacent To Concurrent Fusion	24	0.5
Post Laminectomy Or Discectomy	16	0.3
Adjacent Segment Syndrome	10	0.2
Other	13	0.3
TOTAL	4751	100.0

Table SD18 Most Used Disc Prostheses in Primary Cervical Intervertebral Disc Replacement

2008		2019		2020		2021		2022	
N	Model	N	Model	N	Model	N	Model	N	Model
2	Spinal Disc (DePuy)	461	M6	374	M6	379	M6	214	M6
		120	Synergy Disc	118	Synergy Disc	138	CP-ESP	116	CP-ESP
		102	CP-ESP	112	CP-ESP	127	Synergy Disc	92	Synergy Disc
				13	Baguera	14	Baguera	19	Baguera
Most Used									
2	(1) 100.0%	683	(3) 100.0%	617	(4) 99.8%	658	(4) 100.0%	441	(4) 100.0%

Note: Excludes 1 procedure with an unknown disc prosthesis in 2020

Primary Lumbar Intervertebral Disc Replacement

Table SD19 Primary Lumbar Intervertebral Disc Replacement by Age and Gender

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Female	1192	38.6%	16	87	43	44.3	12.9
Male	1895	61.4%	17	79	44	45.1	12.3
TOTAL	3087	100.0%	16	87	44	44.8	12.6

Figure SD6 Primary Lumbar Intervertebral Disc Replacement by Age and Gender

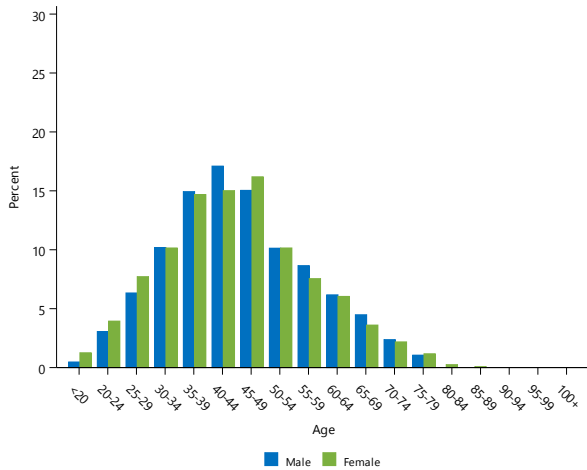


Table SD20 Primary Lumbar Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	2664	86.3
Disc Disease Without Radiculopathy	334	10.8
Pain Of Unknown Cause	28	0.9
Adjacent To Concurrent Fusion	28	0.9
Spondylolisthesis	19	0.6
Post Laminectomy Or Discectomy	4	0.1
Adjacent Segment Syndrome	4	0.1
Other	6	0.2
TOTAL	3087	100.0

Table SD21 Most Used Disc Prostheses in Primary Lumbar Intervertebral Disc Replacement

2008		2019		2020		2021		2022	
N	Model	N	Model	N	Model	N	Model	N	Model
11	Flexicore	361	LP-ESP	353	LP-ESP	305	LP-ESP	163	LP-ESP
		97	M6	83	M6	83	M6	39	M6
						1	Baguera	3	Baguera
Most Used									
11	(1) 100.0%	458	(2) 100.0%	436	(2) 100.0%	389	(3) 100.0%	205	(3) 99.5%

Note: Excludes 1 procedure with an unknown disc prosthesis in 2022

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