

Australian Orthopaedic Association National Joint Replacement Registry

2024 SUPPLEMENTARY REPORT

Demographics of Spinal Disc Arthroplasty



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Demographics of Spinal Disc Arthroplasty

2024 Supplementary Report

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**Demographics
of Spinal Disc Arthroplasty
2024 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 2024 Demographics of Spinal Disc Arthroplasty Supplementary Report is based on the analysis of 12,478 spinal disc procedures recorded by the Registry with a procedure date up to and including 31 December 2023.

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 14 supplementary reports to complete the AOANJRR Annual Report for 2024.

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

<https://aoanjrr.sahmri.com/annual-reports-2024>

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	197	1.6	162	1.3	359	2.9
Spinal Ball Trough	1551	12.4	1403	11.2	2954	23.7
Insert & Endplates	415	3.3	254	2.0	669	5.4
Intervertebral Disc (Cervical)	2804	22.5	2387	19.1	5191	41.6
Intervertebral Disc (Lumbar)	2040	16.3	1265	10.1	3305	26.5
TOTAL	7007	56.2	5471	43.8	12478	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	317	2.5	26	0.2	15	0.1	1	0.0	.	.	359	2.9
Spinal Ball Trough	2384	19.1	419	3.4	131	1.0	18	0.1	2	0.0	2954	23.7
Insert & Endplates	562	4.5	74	0.6	27	0.2	6	0.0	.	.	669	5.4
Intervertebral Disc (Cervical)	4157	33.3	824	6.6	198	1.6	12	0.1	.	.	5191	41.6
Intervertebral Disc (Lumbar)	2588	20.7	476	3.8	203	1.6	37	0.3	1	0.0	3305	26.5
TOTAL	10008	80.2	1819	14.6	574	4.6	74	0.6	3	0.0	12478	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	0.3	23	0.2	2	0.0	11	0.1	115	0.9
2009	36	0.3	31	0.2	27	0.2	3	0.0	4	0.0	101	0.8
2010	57	0.5	15	0.1	32	0.3	23	0.2	14	0.1	141	1.1
2011	51	0.4	14	0.1	30	0.2	33	0.3	14	0.1	142	1.1
2012	26	0.2	7	0.1	22	0.2	64	0.5	36	0.3	155	1.2
2013	30	0.2	116	0.9	44	0.4	139	1.1	52	0.4	381	3.1
2014	30	0.2	192	1.5	33	0.3	301	2.4	89	0.7	645	5.2
2015	18	0.1	257	2.1	25	0.2	403	3.2	265	2.1	968	7.8
2016	24	0.2	264	2.1	24	0.2	313	2.5	316	2.5	941	7.5
2017	21	0.2	338	2.7	21	0.2	514	4.1	415	3.3	1309	10.5
2018	13	0.1	386	3.1	22	0.2	558	4.5	399	3.2	1378	11.0
2019	4	0.0	297	2.4	25	0.2	683	5.5	458	3.7	1467	11.8
2020	.	.	278	2.2	32	0.3	618	5.0	436	3.5	1364	10.9
2021	2	0.0	220	1.8	25	0.2	663	5.3	394	3.2	1304	10.5
2022	6	0.0	207	1.7	122	1.0	465	3.7	212	1.7	1012	8.1
2023	1	0.0	288	2.3	161	1.3	409	3.3	189	1.5	1048	8.4
TOTAL	359	2.9	2954	23.7	669	5.4	5191	41.6	3305	26.5	12478	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	5	0.0	.	.	.	.	8	0.1	14	0.1
L2-L3	9	0.1	.	.	23	0.2	.	.	149	1.2	181	1.5
L3-L4	46	0.4	12	0.1	118	0.9	.	.	512	4.1	688	5.5
L4-L5	227	1.8	17	0.1	347	2.8	.	.	1787	14.3	2378	19.1
L5-S1	64	0.5	5	0.0	167	1.3	.	.	849	6.8	1085	8.7
C2-C3	.	.	7	0.1	.	.	4	0.0	.	.	11	0.1
C3-C4	1	0.0	159	1.3	3	0.0	144	1.2	.	.	307	2.5
C4-C5	1	0.0	517	4.1	4	0.0	643	5.2	.	.	1165	9.3
C5-C6	8	0.1	1340	10.7	3	0.0	2416	19.4	.	.	3767	30.2
C6-C7	2	0.0	874	7.0	3	0.0	1928	15.5	.	.	2807	22.5
C7-T1	.	.	17	0.1	.	.	56	0.4	.	.	73	0.6
TOTAL	359	2.9	2954	23.7	669	5.4	5191	41.6	3305	26.5	12478	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	5471	43.8%	15	87	45	45.6	10.7
Male	7007	56.2%	17	99	45	45.7	10.9
TOTAL	12478	100.0%	15	99	45	45.7	10.8

Figure SD1 Primary Spinal Disc Replacement by Age and Gender

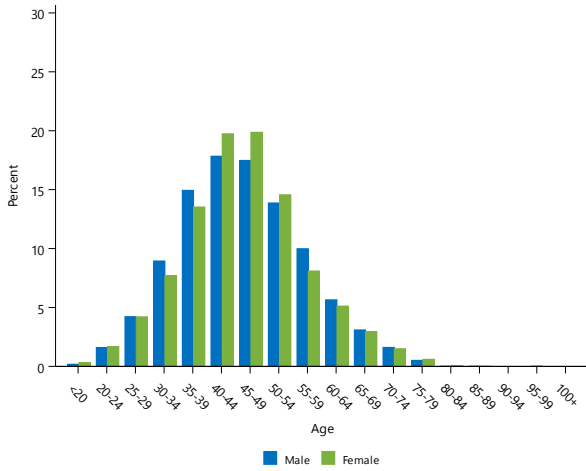


Table SD6 Primary Spinal Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	11054	88.6
Disc Disease Without Radiculopathy	998	8.0
Pain Of Unknown Cause	134	1.1
Spondylolisthesis	101	0.8
Adjacent To Concurrent Fusion	81	0.6
Post Laminectomy Or Discectomy	35	0.3
Adjacent Segment Syndrome	34	0.3
Other	41	0.3
TOTAL	12478	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	45.1%	19	73	40	40.4	10.8
Male	197	54.9%	19	75	40	41.9	11.4
TOTAL	359	100.0%	19	75	40	41.2	11.1

Figure SD2 Primary Spinal Segment Replacement by Age and Gender

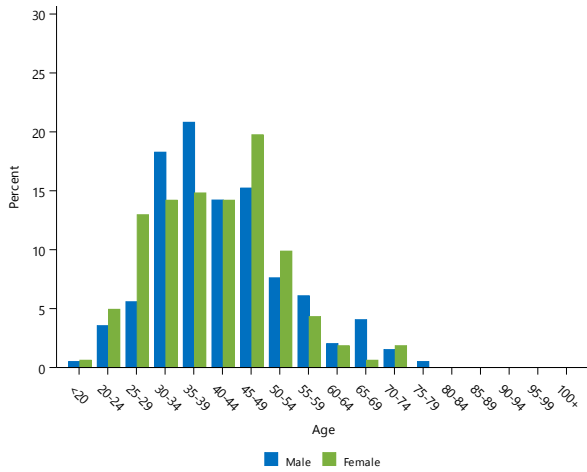


Table SD8 Primary Spinal Segment Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease Without Radiculopathy	183	51.0
Disc Disease With Radiculopathy	151	42.1
Adjacent To Concurrent Fusion	8	2.2
Pain Of Unknown Cause	7	1.9
Spondylolisthesis	5	1.4
Post Laminectomy Or Discectomy	1	0.3
Adjacent Segment Syndrome	1	0.3
Other	3	0.8
TOTAL	359	100.0

Table SD9 Most Used Segment Prostheses in Primary Spinal Segment Replacement

2008		2021		2022		2023	
N	Model	N	Model	N	Model	N	Model
39	Maverick	2	Verte-Stack	6	Verte-Stack	1	Verte-Stack
10 Most Used							
39	(1) 100.0	2	(1) 100.0	6	(1) 100.0	1	(1) 100.0
Remainder							
0	(0) 0%	0	(0) 0%	0	(0) 0%	0	(0) 0%
TOTAL							
39	(1) 100.0	2	(1) 100.0	6	(1) 100.0	1	(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	1403	47.5%	22	81	46	46.4	9.7
Male	1551	52.5%	21	99	46	46.6	10.4
TOTAL	2954	100.0%	21	99	46	46.5	10.1

Figure SD3 Primary Spinal Ball Trough Replacement by Age and Gender

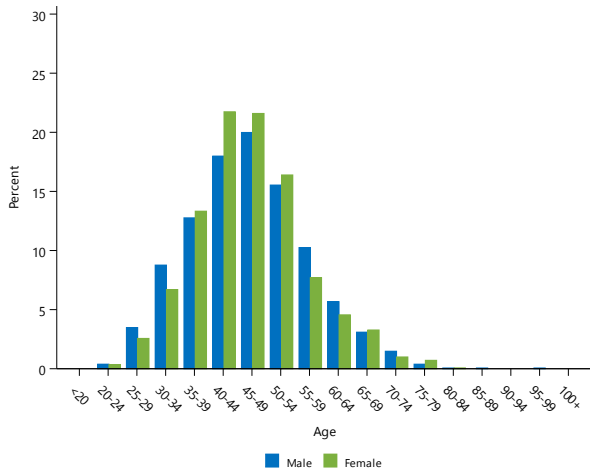


Table SD11 Primary Spinal Ball Trough Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	2712	91.8
Disc Disease Without Radiculopathy	143	4.8
Spondylolisthesis	25	0.8
Pain Of Unknown Cause	20	0.7
Adjacent Segment Syndrome	16	0.5
Adjacent To Concurrent Fusion	13	0.4
Post Laminectomy Or Discectomy	11	0.4
Other	14	0.5
TOTAL	2954	100.0

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

2008		2020		2021		2022		2023						
N	Model	N	Model	N	Model	N	Model	N	Model					
30	Prestige	147	Prodisc-C	118	Prodisc-C	107	Prodisc-C	152	Prodisc-C					
4	Wallis	79	Mobi-C	72	Mobi-C	38	Mobi-C	105	Simplify Disc					
3	Prodisc-C	34	Prestige	30	Prestige	32	Prestige	23	Prestige					
3	X-Stop	16	Activ C			23	Simplify Disc	8	Secure-C					
		2	Secure-C			7	Secure-C							
10 Most Used														
40	(4)	100.0%	278	(5)	100.0%	220	(3)	100.0%	207	(5)	100.0%	288	(4)	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	254	38.0%	18	78	44	44.0	12.4
Male	415	62.0%	20	78	42	43.0	11.2
TOTAL	669	100.0%	18	78	42	43.4	11.7

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

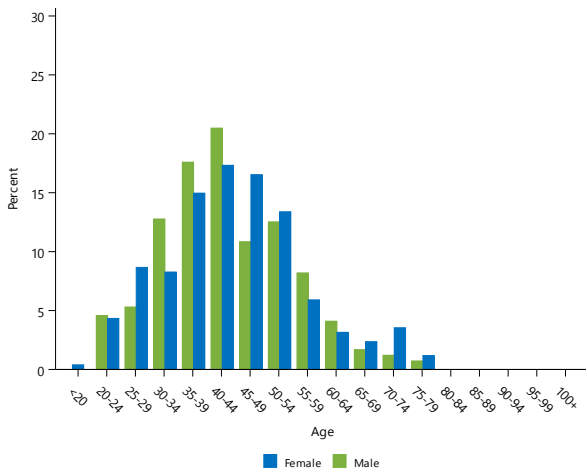


Table SD14 Primary Spinal Insert/Endplate Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	512	76.5
Disc Disease Without Radiculopathy	94	14.1
Pain Of Unknown Cause	39	5.8
Spondylolisthesis	12	1.8
Adjacent To Concurrent Fusion	6	0.9
Adjacent Segment Syndrome	2	0.3
Post Laminectomy Or Discectomy	2	0.3
Other	2	0.3
TOTAL	669	100.0

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

2008		2020		2021		2022		2023	
N	Model	N	Model	N	Model	N	Model	N	Model
16	Prodisc	30	Activ L	21	Activ L	105	Activ L	57	Activ L
7	In Motion	1	Orbit-R	4	Prodisc	17	Prodisc	55	Prodisc-L
		1	Prodisc					49	Prodisc
10 Most Used									
23	(2) 100	32	(3) 100	25	(2) 100	122	(2) 100	161	(3) 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	2387	46.0%	15	78	46	46.5	9.6
Male	2804	54.0%	19	78	46	46.4	9.9
TOTAL	5191	100.0%	15	78	46	46.5	9.8

Figure SD5 Primary Cervical Intervertebral Disc Replacement by Age and Gender

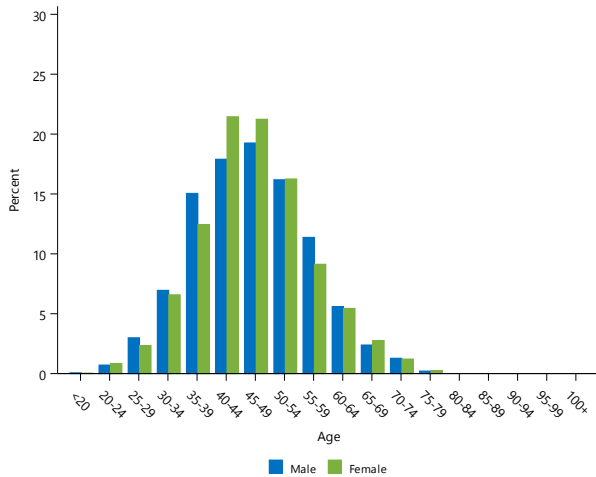


Table SD17 Primary Cervical Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	4824	92.9
Disc Disease Without Radiculopathy	223	4.3
Spondylolisthesis	40	0.8
Pain Of Unknown Cause	36	0.7
Adjacent To Concurrent Fusion	26	0.5
Post Laminectomy Or Discectomy	17	0.3
Adjacent Segment Syndrome	10	0.2
Other	15	0.3
TOTAL	5191	100.0

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

2008		2020		2021		2022		2023	
N	Model	N	Model	N	Model	N	Model	N	Model
2	Spinal Disc (DePuy)	374	M6	382	M6	219	M6	117	Baguera
		118	Synergy Disc	139	CP-ESP	128	CP-ESP	112	CP-ESP
		112	CP-ESP	128	Synergy Disc	95	Synergy Disc	103	Synergy Disc
		13	Baguera	14	Baguera	22	Baguera	75	M6
								2	Rotaio
10 Most Used									
2	(1) 100.0%	618	(5) 100.0%	663	(4) 100.0%	465	(5) 100.0%	409	(5) 100.0%

Note: Excludes one procedure with an unknown disc prosthesis in 2020 and 2022

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	1265	38.3%	16	87	43	44.2	12.7
Male	2040	61.7%	17	79	44	45.0	12.2
TOTAL	3305	100.0%	16	87	44	44.7	12.4

Figure SD6 Primary Lumbar Intervertebral Disc Replacement by Age and Gender

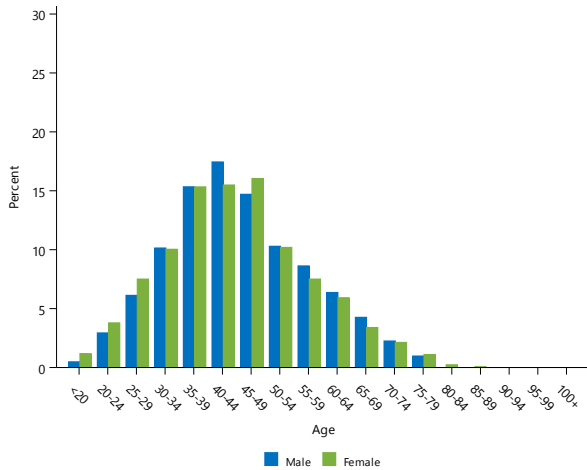


Table SD20 Primary Lumbar Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	2855	86.4
Disc Disease Without Radiculopathy	355	10.7
Pain Of Unknown Cause	32	1.0
Adjacent To Concurrent Fusion	28	0.8
Spondylolisthesis	19	0.6
Adjacent Segment Syndrome	5	0.2
Post Laminectomy Or Discectomy	4	0.1
Other	7	0.2
TOTAL	3305	100.0

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

2008		2020		2021		2022		2023	
N	Model	N	Model	N	Model	N	Model	N	Model
11	Flexicore	353	LP-ESP	309	LP-ESP	169	LP-ESP	129	LP-ESP
		83	M6	84	M6	39	M6	36	Baguera
				1	Baguera	3	Baguera	24	M6
10 Most Used									
11	(1) 100.0%	436	(2) 100.0%	394	(3) 100.0%	212	(4) 100.0%	189	(3) 100.0%

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

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