



AOA
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Australian Orthopaedic Association National Joint Replacement Registry

Demographics of Spinal Disc Arthroplasty



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REPORT
2020

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

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Introduction

The 2020 Demographics of Spinal Disc Arthroplasty Report is based on the analysis of 7,325 spinal disc procedures recorded by the Registry with a procedure date up to and including 31 December 2019.

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 13 supplementary reports to complete the AOANJRR Annual Report for 2020.

Information on the background, purpose, aims, benefits and governance of the Registry can be found on the Introductory chapter of the 2020 Hip, Knee & Shoulder Arthroplasty Annual Report.

The Registry data quality processes including data collection, validation and outcomes assessment, are provided in detail in the Data Quality chapter of the 2020 Hip, Knee & Shoulder Arthroplasty Annual Report: <https://aoanjrr.sahmri.com/annual-reports-2020>

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	189	2.6	153	2.1	342	4.7
Spinal Ball Trough	975	13.3	902	12.3	1877	25.6
Insert & Endplates	196	2.7	123	1.7	319	4.4
Intervertebral Disc (Cervical)	1563	21.3	1303	17.8	2866	39.1
Intervertebral Disc (Lumbar)	1179	16.1	742	10.1	1921	26.2
TOTAL	4102	56.0	3223	44.0	7325	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	306	4.2	25	0.3	10	0.1	1	0.0	.	.	342	4.7
Spinal Ball Trough	1525	20.8	263	3.6	76	1.0	11	0.2	2	0.0	1877	25.6
Insert & Endplates	294	4.0	21	0.3	3	0.0	1	0.0	.	.	319	4.4
Intervertebral Disc (Cervical)	2325	31.7	443	6.0	90	1.2	8	0.1	.	.	2866	39.1
Intervertebral Disc (Lumbar)	1505	20.5	283	3.9	116	1.6	17	0.2	.	.	1921	26.2
TOTAL	5955	81.3	1035	14.1	295	4.0	38	0.5	2	0.0	7325	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	0.1	1	0.0	.	.	1	0.0	7	0.1
2008	39	0.5	40	0.5	23	0.3	2	0.0	11	0.2	115	1.6
2009	36	0.5	31	0.4	26	0.4	3	0.0	4	0.1	100	1.4
2010	57	0.8	15	0.2	32	0.4	23	0.3	14	0.2	141	1.9
2011	51	0.7	14	0.2	30	0.4	32	0.4	14	0.2	141	1.9
2012	24	0.3	7	0.1	21	0.3	63	0.9	36	0.5	151	2.1
2013	29	0.4	115	1.6	39	0.5	139	1.9	52	0.7	374	5.1
2014	30	0.4	193	2.6	31	0.4	301	4.1	88	1.2	643	8.8
2015	18	0.2	256	3.5	25	0.3	401	5.5	265	3.6	965	13.2
2016	24	0.3	264	3.6	24	0.3	314	4.3	318	4.3	944	12.9
2017	21	0.3	324	4.4	21	0.3	510	7.0	393	5.4	1269	17.3
2018	10	0.1	361	4.9	22	0.3	511	7.0	336	4.6	1240	16.9
2019	2	0.0	253	3.5	24	0.3	567	7.7	389	5.3	1235	16.9
TOTAL	342	4.7	1877	25.6	319	4.4	2866	39.1	1921	26.2	7325	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	2	0.0	.	.	.	.	6	0.1	9	0.1
L2-L3	8	0.1	.	.	4	0.1	.	.	70	1.0	82	1.1
L3-L4	45	0.6	6	0.1	34	0.5	.	.	305	4.2	390	5.3
L4-L5	224	3.1	15	0.2	164	2.2	1	0.0	1054	14.4	1458	19.9
L5-S1	63	0.9	5	0.1	107	1.5	.	.	483	6.6	658	9.0
C2-C3	.	.	5	0.1	.	.	2	0.0	.	.	7	0.1
C3-C4	.	.	89	1.2	1	0.0	62	0.8	1	0.0	153	2.1
C4-C5	.	.	310	4.2	2	0.0	323	4.4	2	0.0	637	8.7
C5-C6	1	0.0	870	11.9	3	0.0	1326	18.1	.	.	2200	30.0
C6-C7	.	.	562	7.7	3	0.0	1119	15.3	.	.	1684	23.0
C7-T1	.	.	12	0.2	.	.	33	0.5	.	.	45	0.6
TOTAL	342	4.7	1877	25.6	319	4.4	2866	39.1	1921	26.2	7325	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	3223	44.0%	16	81	45	45.2	10.4
Male	4102	56.0%	17	99	45	45.2	10.9
TOTAL	7325	100.0%	16	99	45	45.2	10.7

Figure SD1 Primary Spinal Disc Replacement by Age and Gender

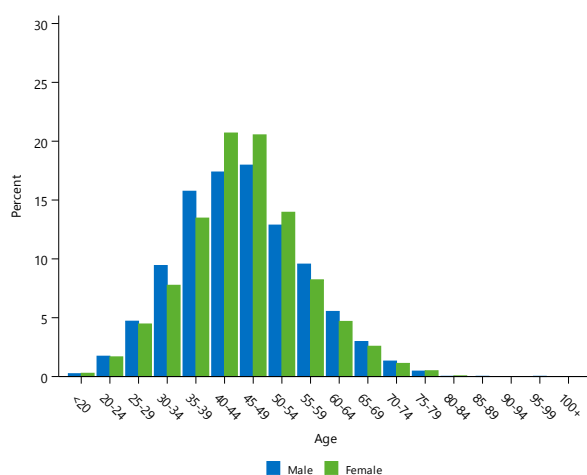


Table SD6 Primary Spinal Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	6276	85.7
Disc Disease Without Radiculopathy	725	9.9
Pain Of Unknown Cause	91	1.2
Spondylolisthesis	78	1.1
Adjacent To Concurrent Fusion	68	0.9
Adjacent Segment Syndrome	26	0.4
Post Laminectomy Or Discectomy	25	0.3
Other	36	0.5
TOTAL	7325	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	153	44.7%	19	72	40	39.9	10.3
Male	189	55.3%	19	75	40	41.4	10.9
TOTAL	342	100.0%	19	75	40	40.7	10.7

Figure SD2 Primary Spinal Segment Replacement by Age and Gender

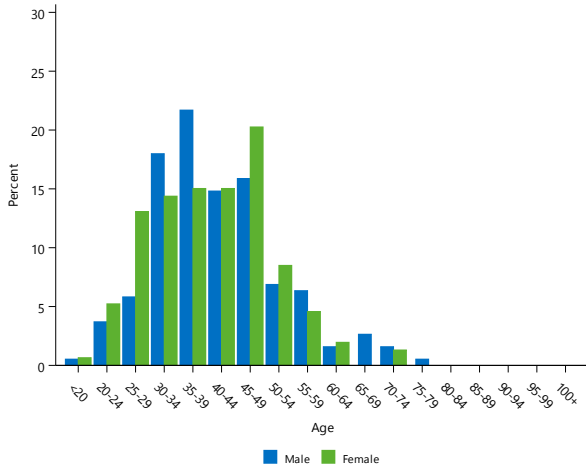


Table SD8 Primary Spinal Segment Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease Without Radiculopathy	182	53.2
Disc Disease With Radiculopathy	137	40.1
Adjacent To Concurrent Fusion	8	2.3
Pain Of Unknown Cause	7	2.0
Spondylolisthesis	3	0.9
Post Laminectomy Or Discectomy	1	0.3
Adjacent Segment Syndrome	1	0.3
Other	3	0.9
TOTAL	342	100.0

Table SD9 Most Used Segment Prostheses in Primary Spinal Segment Replacement

2008		2016		2017		2018		2019	
N	Model	N	Model	N	Model	N	Model	N	Model
39	Maverick	18	TDR	21	TDR	10	TDR	1	TDR
		6	Maverick					1	Verte-Stack
MOST USED									
39	(1) 100.0	24	(2) 100.0	21	(1) 100.0	10	(1) 100.0	2	(2) 100.0

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	902	48.1%	22	81	45	46.1	9.7
Male	975	51.9%	21	99	46	46.1	10.6
TOTAL	1877	100.0%	21	99	46	46.1	10.1

Figure SD3 Primary Spinal Ball Trough Replacement by Age and Gender

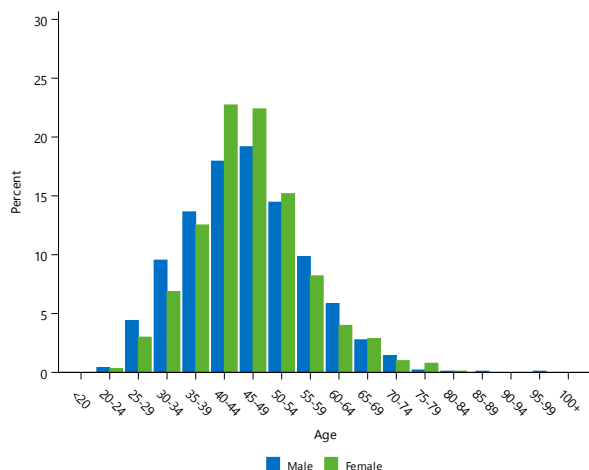


Table SD11 Primary Spinal Ball Trough Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	1693	90.2
Disc Disease Without Radiculopathy	104	5.5
Spondylolisthesis	22	1.2
Pain Of Unknown Cause	15	0.8
Adjacent Segment Syndrome	13	0.7
Adjacent To Concurrent Fusion	12	0.6
Post Laminectomy Or Discectomy	10	0.5
Other	8	0.4
TOTAL	1877	100.0

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

2008		2016		2017		2018		2019	
N	Model	N	Model	N	Model	N	Model	N	Model
30	Prestige	125	Prodisc-C	163	Prodisc-C	168	Mobi-C	114	Prodisc-C
4	Wallis	88	Mobi-C	96	Mobi-C	125	Prodisc-C	102	Mobi-C
3	Prodisc-C	44	Prestige	48	Prestige	49	Prestige	31	Prestige
3	X-Stop	5	Bryan	15	Bryan	13	Bryan	6	Activ C
		2	Secure-C	2	Secure-C	5	Activ C		
						1	Secure-C		
MOST USED									
40	(4) 100	264	(5) 100	324	(5) 100	361	(6) 100	253	(4) 100

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	123	38.6%	20	69	40	40.1	9.7
Male	196	61.4%	20	77	41	40.9	9.9
TOTAL	319	100.0%	20	77	41	40.6	9.8

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

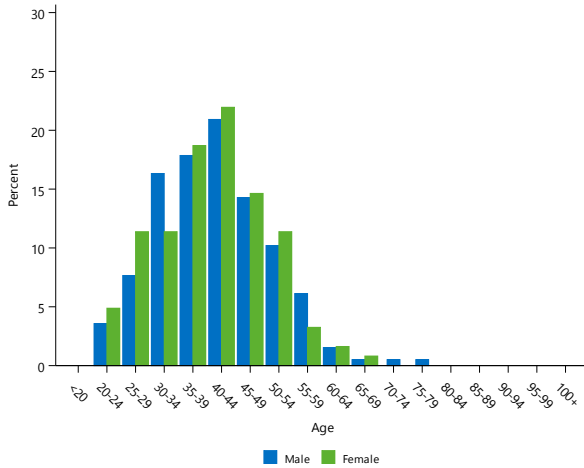


Table SD14 Primary Spinal Insert/Endplate Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	190	59.6
Disc Disease Without Radiculopathy	81	25.4
Pain Of Unknown Cause	25	7.8
Spondylolisthesis	10	3.1
Adjacent To Concurrent Fusion	6	1.9
Adjacent Segment Syndrome	2	0.6
Post Laminectomy Or Discectomy	1	0.3
Other	4	1.3
TOTAL	319	100.0

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

2008		2016		2017		2018		2019	
N	Model	N	Model	N	Model	N	Model	N	Model
16	Prodisc	23	Prodisc	10	Activ L	19	Activ L	18	Activ L
7	In Motion	1	Secure-C	9	Prodisc	2	Secure-C	6	Prodisc
				2	Secure-C	1	Prodisc		
MOST USED									
23	(2) 100	24	(2) 100	21	(3) 100	22	(3) 100	24	(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	1303	45.5%	22	78	46	46.4	9.2
Male	1563	54.5%	19	76	46	46.1	9.9
TOTAL	2866	100.0%	19	78	46	46.2	9.6

Figure SD5 Primary Cervical Intervertebral Disc Replacement by Age and Gender

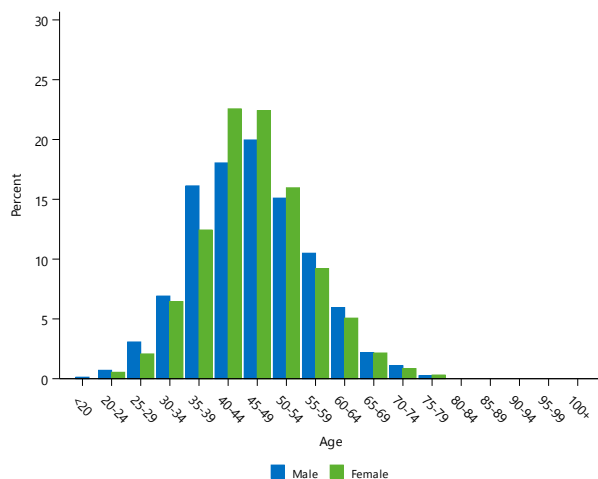


Table SD17 Primary Cervical Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	2649	92.4
Disc Disease Without Radiculopathy	114	4.0
Spondylolisthesis	28	1.0
Pain Of Unknown Cause	23	0.8
Adjacent To Concurrent Fusion	19	0.7
Post Laminectomy Or Discectomy	11	0.4
Adjacent Segment Syndrome	7	0.2
Other	15	0.5
TOTAL	2866	100.0

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

2008		2016		2017		2018		2019	
N	Model	N	Model	N	Model	N	Model	N	Model
2	Spinal Disc (DePuy)	251	M6	405	M6	421	M6	383	M6
		27	CP-ESP	56	CP-ESP	48	CP-ESP	95	Synergy Disc
		27	Synergy Disc	40	Synergy Disc	41	Synergy Disc	89	CP-ESP
		4	Freedom	6	Freedom	1	Baguera		
		2	Baguera	3	Baguera				
		2	Discocerv						
		1	Rotaio						
MOST USED									
2	(1) 100.0%	314	(7) 100.0%	510	(5) 100.0%	511	(4) 100.0%	567	(3) 100.0%

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	742	38.6%	16	81	43	44.2	12.4
Male	1179	61.4%	17	79	44	44.7	12.3
TOTAL	1921	100.0%	16	81	44	44.5	12.4

Figure SD6 Primary Lumbar Intervertebral Disc Replacement by Age and Gender

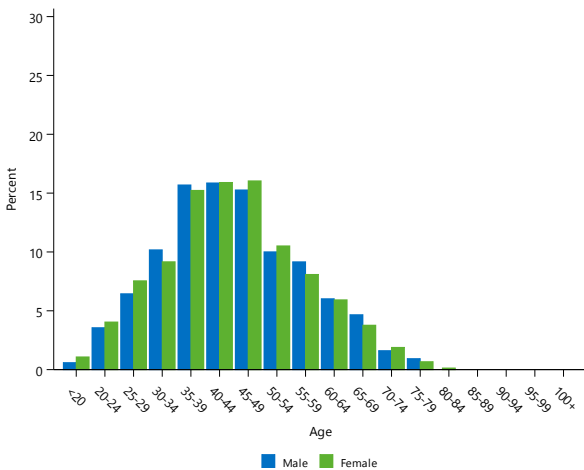


Table SD20 Primary Lumbar Intervertebral Disc Replacement by Primary Diagnosis

Primary Diagnosis	Number	Percent
Disc Disease With Radiculopathy	1607	83.7
Disc Disease Without Radiculopathy	244	12.7
Adjacent To Concurrent Fusion	23	1.2
Pain Of Unknown Cause	21	1.1
Spondylolisthesis	15	0.8
Adjacent Segment Syndrome	3	0.2
Post Laminectomy Or Discectomy	2	0.1
Other	6	0.3
TOTAL	1921	100.0

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

2008		2016		2017		2018		2019	
N	Model	N	Model	N	Model	N	Model	N	Model
11	Flexicore	257	LP-ESP	320	LP-ESP	268	LP-ESP	307	LP-ESP
		59	M6	70	M6	68	M6	82	M6
		2	Australis	3	Freedom				
MOST USED									
11	(1) 100.0%	318	(3) 100.0%	393	(3) 100.0%	336	(2) 100.0%	389	(2) 100.0%

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