



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 1267

Depuy Synthes Australia

Attune CR Total Knee

Report Generated: 10 May 2019

Data Period: 1 September 1999 - 9 May 2019

This report has been prepared by the Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR). The report provides information on the usage and outcomes of the Attune CR femoral compared to all other total knee replacements, based on data collected by the AOANJRR.

Disclaimer

The AOANJRR has taken every care to ensure that the data supplied are accurate but does not warrant that the data are error free and does not accept any liability for errors or omissions in the data.

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Catalogue Numbers of Attune CR Femoral Components included in this analysis

Model	Catalogue Range	Range Description	No. of Primary Procedures
Attune CR	150400101 - 150400210	CR Femoral Component	9899
Attune CR	150400123 - 150400226	CR Narrow Femoral Component	2853

The AOANJRR also reports these catalogue numbers as Attune CR Femoral Components. These are not included in the analysis.

Model	Catalogue Range	Range Description
Attune CR	150401103 - 150401226	CR Femoral Component Porocoat

Table 1: Revision Rates of Attune CR Primary Total Knee Replacement by Femoral Catalogue Number Range (All Diagnoses)

Femoral Range	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150400101 - 150400210	146	9899	22073	0.66 (0.56, 0.78)
150400123 - 150400226	43	2853	6345	0.68 (0.49, 0.91)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

Table 2: Implant Usage of Attune CR in Primary Total Knee Replacement (All Diagnoses)

	N
Implant Usage	
Date First Used	12 February 2013
Date Last Used	30 April 2019
N Procedures	12752
N Patients	10931
N Hospitals Implanting	148
N Surgeons Implanting*	194
Outcome	
N Revised	189
N Deceased**	200

*435 Attune CR procedures have unknown surgeon

**N Deceased' does not include patient deaths that occurred after the Attune CR implant was revised

Table 3: Follow Up Years of Attune CR Primary Total Knee Replacement (All Diagnoses)

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune CR	12752	0.01	6.23	2.07	2.23	1.34
TOTAL	12752	0.01	6.23	2.07	2.23	1.34

Table 4: Age and Gender of Attune CR Primary Total Knee Replacement (All Diagnoses)

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	5769	45.2%	32	93	68	67.7	8.7
Female	6983	54.8%	18	94	68	68.1	9.2
TOTAL	12752	100.0%	18	94	68	67.9	9.0

Table 5: Primary Total Knee Replacement by Model and Age (All Diagnoses)

Age	Attune CR		Other Total Knee	
	N	Col%	N	Col%
<55	913	7.2	44712	6.8
55-64	3489	27.4	173721	26.4
65-74	5277	41.4	258844	39.3
≥75	3073	24.1	181968	27.6
TOTAL	12752	100.0	659245	100.0

Table 6: Primary Total Knee Replacement by Model and Gender (All Diagnoses)

Gender	Attune CR		Other Total Knee	
	N	Col%	N	Col%
Male	5769	45.2	286358	43.4
Female	6983	54.8	372887	56.6
TOTAL	12752	100.0	659245	100.0

Table 7: Primary Total Knee Replacement by Model and ASA Grade (All Diagnoses)

ASA Grade	Attune CR		Other Total Knee	
	N	Col%	N	Col%
1	724	5.7	17519	6.0
2	7041	55.4	161582	55.4
3	4803	37.8	109262	37.5
4	136	1.1	3216	1.1
5	.	.	17	0.0
TOTAL	12704	100.0	291596	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 48 Attune CR procedures with no ASA Grade recorded are excluded from this table

Table 8: Primary Total Knee Replacement by Model and BMI (All Diagnoses)

BMI	Attune CR		Other Total Knee	
	N	Col%	N	Col%
Underweight (<18.50)	25	0.2	408	0.2
Normal (18.50-24.99)	975	9.7	21083	10.5
Pre Obese (25.00-29.99)	3071	30.5	62538	31.1
Obese Class 1 (30.00-34.99)	3163	31.4	61544	30.6
Obese Class 2 (35.00-39.99)	1842	18.3	34124	17.0
Obese Class 3 (≥40.00)	997	9.9	21383	10.6
TOTAL	10073	100.0	201080	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 2679 Attune CR procedures with no BMI recorded are excluded from this table

Table 9: Primary Total Knee Replacement by Model and Primary Diagnosis

Primary Diagnosis	Attune CR		Other Total Knee	
	N	Col%	N	Col%
Osteoarthritis	12585	98.7	643751	97.6
Rheumatoid Arthritis	95	0.7	8539	1.3
Other Inflammatory Arthritis	37	0.3	3359	0.5
Osteonecrosis	32	0.3	2089	0.3
Tumour	.	.	813	0.1
Fracture	1	0.0	483	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	2	0.0	191	0.0
TOTAL	12752	100.0	659245	100.0

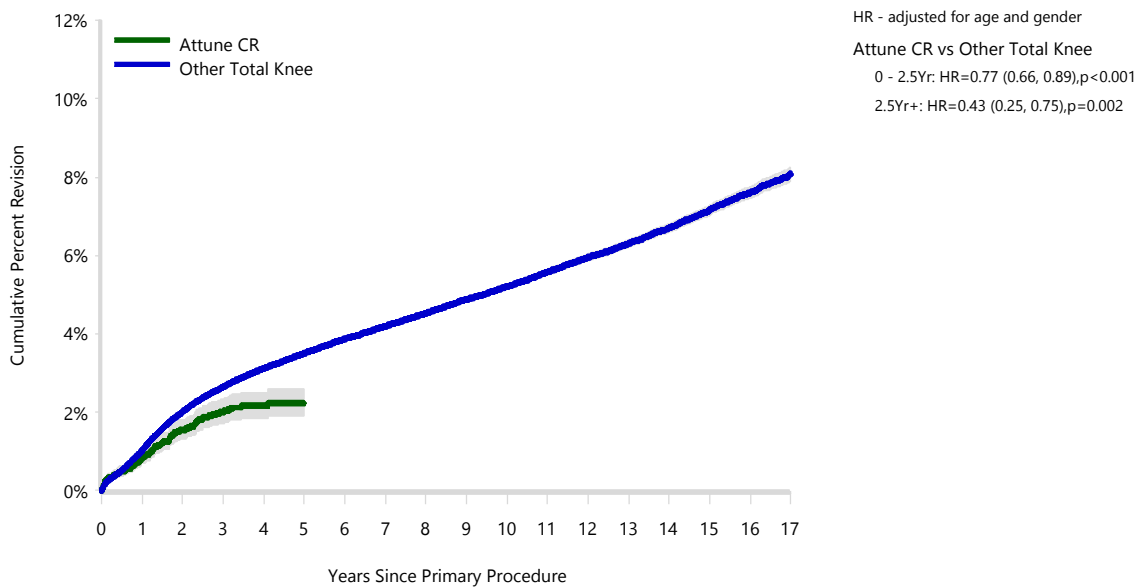
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune CR	189	12752	28418	0.67 (0.57, 0.77)
Other Total Knee	25796	659245	4285857	0.60 (0.59, 0.61)
TOTAL	25985	671997	4314275	0.60 (0.60, 0.61)

Table 11: Yearly Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	
Attune CR	0.8 (0.7, 1.0)	1.5 (1.3, 1.8)	2.0 (1.7, 2.3)	2.2 (1.9, 2.5)	2.2 (1.9, 2.6)	
Other Total Knee	1.0 (1.0, 1.0)	2.0 (2.0, 2.0)	2.6 (2.6, 2.7)	3.1 (3.1, 3.2)	3.5 (3.5, 3.6)	
CPR	6 Yrs	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs
Attune CR						
Other Total Knee	3.9 (3.8, 3.9)	4.2 (4.1, 4.3)	4.5 (4.5, 4.6)	4.9 (4.8, 4.9)	5.2 (5.1, 5.3)	5.6 (5.5, 5.7)
CPR	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs
Attune CR						
Other Total Knee	6.0 (5.9, 6.0)	6.3 (6.2, 6.4)	6.7 (6.6, 6.8)	7.2 (7.0, 7.3)	7.6 (7.5, 7.8)	8.1 (7.9, 8.3)

Figure 1: Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)



Number at Risk	0 Yr	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
Attune CR	12752	9885	6631	3813	1636	174	11	0	0
Other Total Knee	659245	601616	538543	478885	422667	369105	317954	270537	226200
Number at Risk	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs
Attune CR	0	0	0	0	0	0	0	0	0
Other Total Knee	185934	150376	119212	92065	68731	49126	32775	19875	9620

TABLE 12

Reasons for Revision

This is reported in two ways: a percentage of primary procedures revised and as a percentage of all revision procedures.

% Primaries Revised: This shows the proportional contribution of each revision diagnosis as a percentage of the total number of primary procedures. This percentage can be used to approximate the risk of being revised for that diagnosis. Differing percentages between groups, with the same distribution of follow up time, may identify problems of concern.

% Revisions: The number of revisions for each diagnosis is expressed as a percentage of the total number of revisions. This shows the distribution of reasons for revision within a group but cannot be used as a comparison between groups.

Table 12: Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses) (Follow-up Limited to 6.2 Years)

Revision Diagnosis	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	85	0.7	45.0	5392	0.8	25.8
Loosening	24	0.2	12.7	4942	0.7	23.6
Patellofemoral Pain	11	0.1	5.8	2154	0.3	10.3
Pain	16	0.1	8.5	1799	0.3	8.6
Instability	15	0.1	7.9	1726	0.3	8.3
Patella Erosion	12	0.1	6.3	1041	0.2	5.0
Arthrofibrosis	12	0.1	6.3	849	0.1	4.1
Fracture	2	0.0	1.1	573	0.1	2.7
Malalignment	2	0.0	1.1	502	0.1	2.4
Metal Related Pathology	2	0.0	1.1	281	0.0	1.3
Incorrect Sizing	2	0.0	1.1	270	0.0	1.3
Lysis	1	0.0	0.5	211	0.0	1.0
Patella Maltracking	2	0.0	1.1	165	0.0	0.8
Wear Tibial Insert				159	0.0	0.8
Bearing Dislocation				157	0.0	0.8
Implant Breakage Patella				100	0.0	0.5
Implant Breakage Tibial Insert				72	0.0	0.3
Synovitis				67	0.0	0.3
Prosthesis Dislocation				61	0.0	0.3
Osteonecrosis				49	0.0	0.2
Implant Breakage Tibial				35	0.0	0.2
Implant Breakage Femoral				26	0.0	0.1
Tumour				19	0.0	0.1
Wear Patella				15	0.0	0.1
Heterotopic Bone				5	0.0	0.0
Wear Tibial				5	0.0	0.0
Incorrect Side				2	0.0	0.0
Wear Femoral				2	0.0	0.0
Patella Dislocation				1	0.0	0.0
Progression Of Disease				1	0.0	0.0
Other	3	0.0	1.6	225	0.0	1.1
N Revision	189	1.5	100.0	20906	3.2	100.0
N Primary	12752			659245		

Note: This table is restricted to revisions within 6.2 years for all groups to allow a time-matched comparison of revisions.

Table 13: Yearly Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses)

Model	Event	N Events	1 Yr	2 Yrs	3 Yrs	5 Yrs	10 Yrs	15 Yrs
Attune CR	Infection	85	0.5 (0.4, 0.7)	0.7 (0.6, 0.9)	0.8 (0.6, 1.0)	0.9 (0.7, 1.1)		
	Loosening	24	0.1 (0.0, 0.1)	0.2 (0.1, 0.3)	0.3 (0.2, 0.4)	0.3 (0.2, 0.5)		
	Pain	16	0.0 (0.0, 0.1)	0.1 (0.1, 0.2)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)		
	Instability	15	0.1 (0.0, 0.1)	0.1 (0.0, 0.2)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)		
	Arthrofibrosis	12	0.1 (0.0, 0.1)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)		
	Other	37	0.2 (0.1, 0.2)	0.3 (0.2, 0.4)	0.4 (0.3, 0.6)	0.5 (0.3, 0.7)		
	Deceased	200	0.4 (0.3, 0.5)	1.1 (0.9, 1.4)	2.2 (1.9, 2.6)	4.4 (3.3, 5.6)		
	All Revision	189	0.8 (0.7, 1.0)	1.5 (1.3, 1.8)	2.0 (1.7, 2.3)	2.2 (1.9, 2.6)		
	Other Total Knee	Infection	6032	0.4 (0.4, 0.4)	0.6 (0.6, 0.6)	0.7 (0.7, 0.7)	0.9 (0.8, 0.9)	1.1 (1.1, 1.1)
Loosening		6462	0.2 (0.2, 0.2)	0.4 (0.4, 0.4)	0.6 (0.6, 0.6)	0.8 (0.8, 0.8)	1.3 (1.2, 1.3)	1.7 (1.7, 1.8)
Pain		2088	0.0 (0.0, 0.1)	0.2 (0.1, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.5 (0.4, 0.5)
Instability		2083	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.5 (0.5, 0.5)
Arthrofibrosis		897	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.2 (0.2, 0.2)	0.2 (0.2, 0.2)
Other		8234	0.3 (0.2, 0.3)	0.6 (0.5, 0.6)	0.7 (0.7, 0.8)	1.0 (1.0, 1.0)	1.6 (1.5, 1.6)	2.2 (2.1, 2.2)
Deceased		10135 7	0.8 (0.7, 0.8)	1.8 (1.8, 1.8)	3.1 (3.1, 3.2)	6.7 (6.6, 6.8)	20.7 (20.5, 20.8)	39.0 (38.7, 39.2)
All Revision		25796	1.0 (1.0, 1.0)	2.0 (2.0, 2.0)	2.6 (2.6, 2.7)	3.4 (3.4, 3.5)	4.9 (4.8, 5.0)	6.2 (6.2, 6.3)

Figure 2: Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement by Model (All Diagnoses)

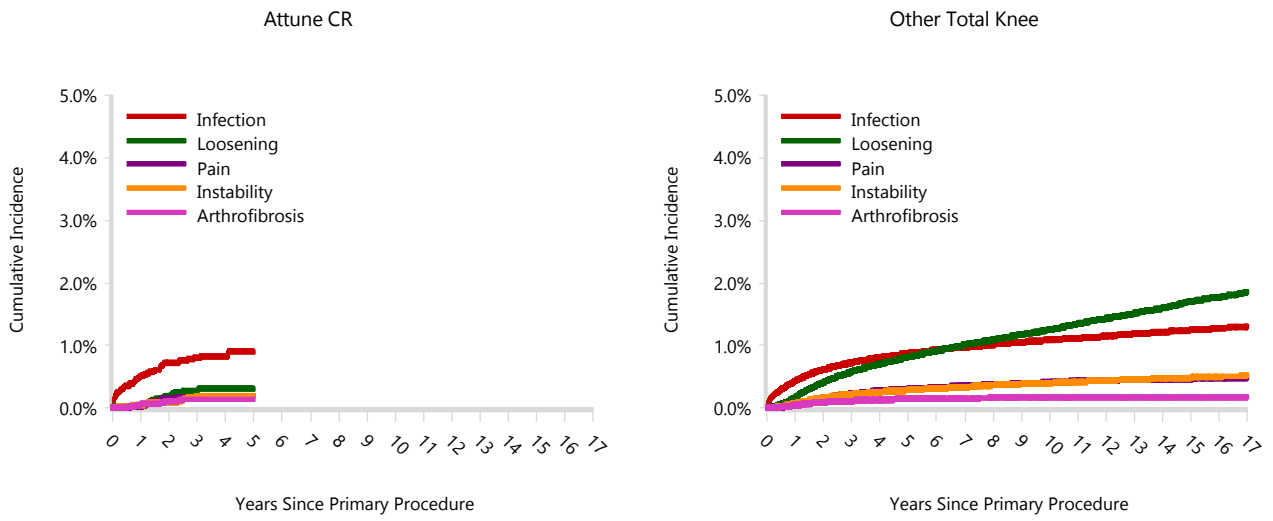


TABLE 14

Type of Revision

This is reported in two ways: a percentage of primary procedures revised and as a percentage of all revision procedures.

% Primaries Revised: This shows the proportional contribution of each type of revision as a percentage of the total number of primary procedures. This percentage can be used to approximate the risk of having that type of revision. Differing percentages between groups, with the same distribution of follow up time, may identify problems of concern.

% Revisions: The number of revisions for each type of revision is expressed as a percentage of the total number of revisions. This shows the distribution of types of revision within a group but cannot be used as a comparison between groups.

Table 14: Type of Revision of Primary Total Knee Replacement by Model (All Diagnoses) (Follow-up Limited to 6.2 Years)

Type of Revision	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	77	0.6	40.7	5182	0.8	24.8
TKR (Tibial/Femoral)	32	0.3	16.9	4831	0.7	23.1
Patella Only	34	0.3	18.0	4343	0.7	20.8
Tibial Component	7	0.1	3.7	1998	0.3	9.6
Insert/Patella	13	0.1	6.9	1777	0.3	8.5
Femoral Component	11	0.1	5.8	1321	0.2	6.3
Cement Spacer	12	0.1	6.3	1231	0.2	5.9
Removal of Prostheses	1	0.0	0.5	138	0.0	0.7
Minor Components	2	0.0	1.1	52	0.0	0.2
Cement Only				13	0.0	0.1
Total Femoral				11	0.0	0.1
Reinsertion of Components				9	0.0	0.0
N Revision	189	1.5	100.0	20906	3.2	100.0
N Primary	12752			659245		

Note: This table is restricted to revisions within 6.2 years for all groups to allow a time-matched comparison of revisions.

Table 15: Revision Rates of Attune CR Primary Total Knee Replacement by Fixation (All Diagnoses)

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Cemented	189	12751	28415	0.67 (0.57, 0.77)
Hybrid (Tibial Cemented)	0	1	3	0.00 (0.00, 133.4)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

Table 16: Revision Rates of Attune CR Primary Total Knee Replacement by Polyethylene Type (All Diagnoses)

Polyethylene Type	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
XLPE	0	1	1	0.00 (0.00, 545.5)
XLPE + Antioxidant	189	12751	28417	0.67 (0.57, 0.77)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

Table 17: Revision Rates of Attune CR Primary Total Knee Replacement by Bearing Mobility (All Diagnoses)

Bearing Mobility	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Fixed	134	8059	18888	0.71 (0.59, 0.84)
Rotating	55	4693	9530	0.58 (0.43, 0.75)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

Table 18: Revision Rates of Attune CR Primary Total Knee Replacement by Patella Usage (All Diagnoses)

Patella Usage	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Patella Used	107	8413	18133	0.59 (0.48, 0.71)
No Patella	82	4339	10285	0.80 (0.63, 0.99)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

Table 19: Number of Revisions of Attune CR Primary Total Knee Replacement by Year of Implant (All Diagnoses)

Year of Implant	Number Revised	Total Number
2013	2	83
2014	34	919
2015	39	2218
2016	41	2488
2017	43	3172
2018	28	3131
2019	2	741
TOTAL	189	12752

Table 20: Revision Rates of Attune CR Primary Total Knee Replacement by Tibial Component (All Diagnoses)

Tibial	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	189	12749	28411	0.67 (0.57, 0.77)
Custom Made (Depuy)	0	2	7	0.00 (0.00, 55.61)
Other Tibial Components*	0	1	1	0.00 (0.00, 545.5)
TOTAL	189	12752	28418	0.67 (0.57, 0.77)

*denotes tibial components distributed by other companies

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