



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 823

Depuy Synthes Australia

Attune CR Total Knee

Report Generated: 9 January 2019

Data Period: 1 September 1999 - 8 January 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 total knee femoral based on data collected by the AOANJRR.

This analysis compares Attune CR femoral components to all other total knee replacements.

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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Data Period: 1 September 1999 - 8 January 2019

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	9124
Attune CR	150400123 - 150400226	CR Narrow Femoral Component	2611

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	116	9124	18947	0.61 (0.51, 0.73)
150400123 - 150400226	33	2611	5429	0.61 (0.42, 0.85)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

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	19 December 2018
N Procedures	11735
N Patients	10137
N Hospitals Implanting	144
N Surgeons Implanting*	188
Outcome	
N Revised	149
N Deceased**	151

*424 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	11735	0.01	5.90	1.89	2.08	1.26
TOTAL	11735	0.01	5.90	1.89	2.08	1.26

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	5325	45.4%	32	93	68	67.7	8.7
Female	6410	54.6%	18	94	68	68.0	9.2
TOTAL	11735	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	846	7.2	43528	6.8
55-64	3229	27.5	168832	26.3
65-74	4847	41.3	251275	39.2
≥75	2813	24.0	177514	27.7
TOTAL	11735	100.0	641149	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	5325	45.4	278198	43.4
Female	6410	54.6	362951	56.6
TOTAL	11735	100.0	641149	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	673	5.8	16523	6.0
2	6490	55.5	152085	55.6
3	4405	37.7	101901	37.3
4	120	1.0	3016	1.1
5	.	.	16	0.0
TOTAL	11688	100.0	273541	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 47 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)	24	0.3	369	0.2
Normal (18.50-24.99)	867	9.6	19221	10.5
Pre Obese (25.00-29.99)	2778	30.6	57083	31.1
Obese Class 1 (30.00-34.99)	2873	31.7	55985	30.5
Obese Class 2 (35.00-39.99)	1634	18.0	31151	17.0
Obese Class 3 (\geq 40.00)	891	9.8	19471	10.6
TOTAL	9067	100.0	183280	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 2668 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	11577	98.7	626032	97.6
Rheumatoid Arthritis	90	0.8	8376	1.3
Other Inflammatory Arthritis	36	0.3	3242	0.5
Osteonecrosis	30	0.3	2038	0.3
Tumour	.	.	799	0.1
Fracture	.	.	458	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	2	0.0	184	0.0
TOTAL	11735	100.0	641149	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	149	11735	24376	0.61 (0.52, 0.72)
Other Total Knee	24801	641149	4111980	0.60 (0.60, 0.61)
TOTAL	24950	652884	4136356	0.60 (0.60, 0.61)

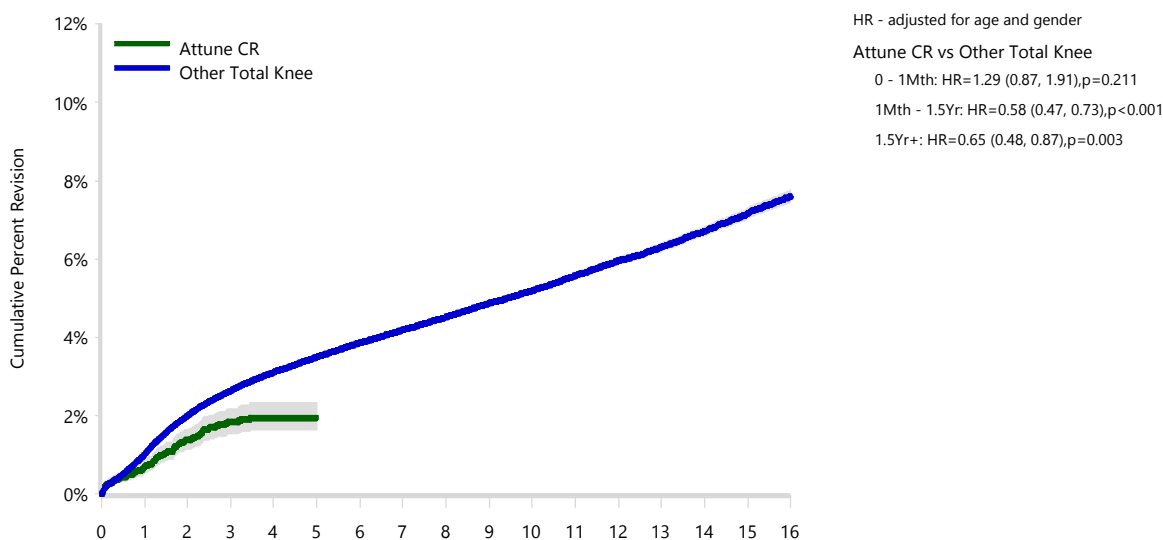


Table 11: Yearly Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	
Attune CR	0.7 (0.6, 0.9)	1.4 (1.2, 1.6)	1.8 (1.5, 2.2)	2.0 (1.6, 2.3)	2.0 (1.6, 2.3)	
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 (3.4, 3.5)	
CPR	6 Yrs	7 Yrs	8 Yrs	9 Yrs	10 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)	
CPR	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Attune CR						
Other Total Knee	5.6 (5.5, 5.7)	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 (7.4, 7.7)



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	
Attune CR	11735	8777	5562	3094	957	78	0	0	
Other Total Knee	641149	583415	521276	463086	407188	354512	304806	258400	
Number at Risk	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Attune CR	0	0	0	0	0	0	0	0	0
Other Total Knee	215396	176192	141949	111473	85564	63322	44295	28922	16523

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 5.9 Years)

Revision Diagnosis	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	65	0.6	43.6	5110	0.8	25.7
Loosening	19	0.2	12.8	4705	0.7	23.7
Patellofemoral Pain	10	0.1	6.7	2092	0.3	10.5
Pain	13	0.1	8.7	1710	0.3	8.6
Instability	12	0.1	8.1	1627	0.3	8.2
Patella Erosion	9	0.1	6.0	979	0.2	4.9
Arthrofibrosis	9	0.1	6.0	804	0.1	4.0
Fracture	2	0.0	1.3	544	0.1	2.7
Malalignment	1	0.0	0.7	473	0.1	2.4
Metal Related Pathology	2	0.0	1.3	270	0.0	1.4
Incorrect Sizing	2	0.0	1.3	261	0.0	1.3
Lysis	1	0.0	0.7	199	0.0	1.0
Patella Maltracking	2	0.0	1.3	161	0.0	0.8
Bearing Dislocation				154	0.0	0.8
Wear Tibial Insert				152	0.0	0.8
Implant Breakage Patella				94	0.0	0.5
Implant Breakage Tibial Insert				70	0.0	0.4
Synovitis				65	0.0	0.3
Prosthesis Dislocation				59	0.0	0.3
Osteonecrosis				47	0.0	0.2
Implant Breakage Tibial				35	0.0	0.2
Implant Breakage Femoral				25	0.0	0.1
Tumour				18	0.0	0.1
Wear Patella				14	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
Other	2	0.0	1.3	205	0.0	1.0
N Revision	149	1.3	100.0	19888	3.1	100.0
N Primary	11735			641149		

Note: This table is restricted to revisions within 5.9 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	65	0.4 (0.3, 0.6)	0.6 (0.5, 0.8)	0.7 (0.5, 0.9)	0.7 (0.5, 0.9)		
	Loosening	19	0.0 (0.0, 0.1)	0.2 (0.1, 0.3)	0.3 (0.2, 0.4)	0.3 (0.2, 0.4)		
	Pain	13	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	12	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)		
	Patellofemoral Pain	10	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.1 (0.1, 0.3)	0.2 (0.1, 0.4)		
	Other	30	0.1 (0.1, 0.2)	0.3 (0.2, 0.4)	0.4 (0.3, 0.5)	0.4 (0.3, 0.6)		
	Deceased	151	0.4 (0.3, 0.5)	1.1 (0.9, 1.3)	2.0 (1.7, 2.4)	3.3 (2.6, 4.2)		
	All Revision	149	0.7 (0.6, 0.9)	1.4 (1.1, 1.6)	1.8 (1.5, 2.2)	1.9 (1.6, 2.3)		
Other Total Knee	Infection	5761	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 (1.0, 1.1)	1.2 (1.2, 1.3)
	Loosening	6250	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	2013	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	1975	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 (0.4, 0.5)
	Patellofemoral Pain	2454	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.3, 0.4)	0.5 (0.5, 0.5)	0.6 (0.5, 0.6)
	Other	6348	0.2 (0.2, 0.2)	0.4 (0.4, 0.5)	0.6 (0.6, 0.6)	0.8 (0.8, 0.8)	1.2 (1.2, 1.3)	1.8 (1.7, 1.8)
	Deceased	95841	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 (20.6, 20.8)	38.8 (38.5, 39.0)
	All Revision	24801	1.0 (1.0, 1.0)	2.0 (2.0, 2.0)	2.6 (2.6, 2.6)	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)

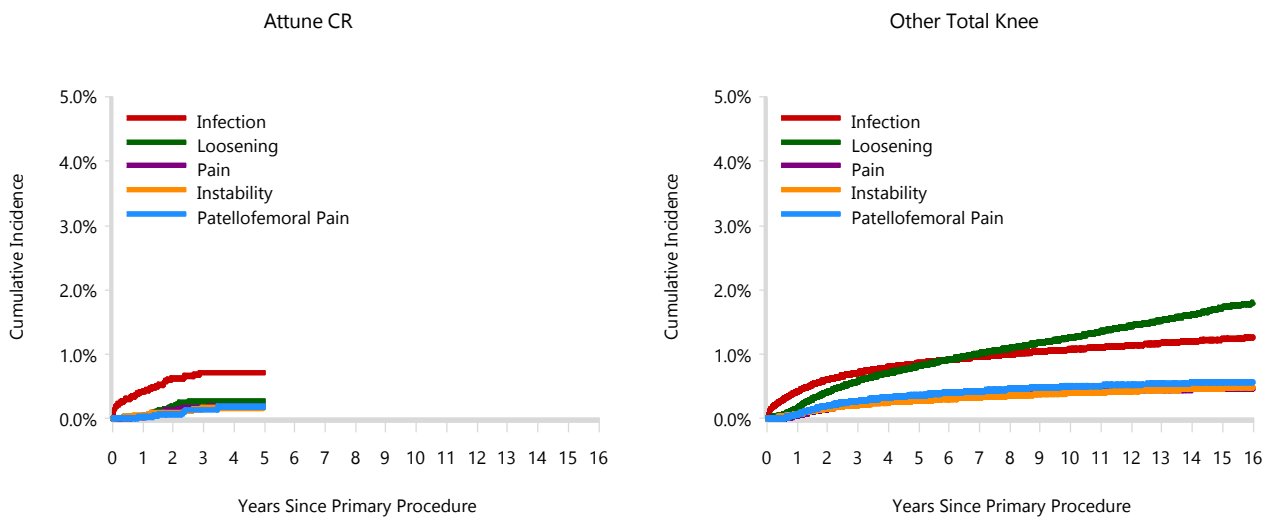


TABLE 14

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 5.9 Years)

Type of Revision	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	62	0.5	41.6	4885	0.8	24.6
TKR (Tibial/Femoral)	27	0.2	18.1	4539	0.7	22.8
Patella Only	29	0.2	19.5	4179	0.7	21.0
Tibial Component	5	0.0	3.4	1933	0.3	9.7
Insert/Patella	9	0.1	6.0	1683	0.3	8.5
Femoral Component	5	0.0	3.4	1292	0.2	6.5
Cement Spacer	10	0.1	6.7	1168	0.2	5.9
Removal of Prostheses	1	0.0	0.7	125	0.0	0.6
Minor Components	1	0.0	0.7	51	0.0	0.3
Cement Only				12	0.0	0.1
Total Femoral				12	0.0	0.1
Reinsertion of Components				9	0.0	0.0
N Revision	149	1.3	100.0	19888	3.1	100.0
N Primary	11735			641149		

Note: This table is restricted to revisions within 5.9 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	149	11734	24374	0.61 (0.52, 0.72)
Hybrid (Tibial Cemented)	0	1	2	0.00 (0.00, 151.6)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

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	0	0.00 (0.00, 1069)
XLPE + Antioxidant	149	11733	24376	0.61 (0.52, 0.72)
Unknown	0	1	0	0.00 (0.00, 2173)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

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	113	7452	16350	0.69 (0.57, 0.83)
Rotating	36	4282	8026	0.45 (0.31, 0.62)
Unknown	0	1	0	0.00 (0.00, 2173)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

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	84	7650	15466	0.54 (0.43, 0.67)
No Patella	65	4085	8910	0.73 (0.56, 0.93)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

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	33	919
2015	36	2217
2016	36	2485
2017	34	3171
2018	8	2860
TOTAL	149	11735

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	149	11732	24370	0.61 (0.52, 0.72)
Custom Made (Depuy)	0	2	6	0.00 (0.00, 61.78)
Other Tibial Components*	0	1	0	0.00 (0.00, 1069)
TOTAL	149	11735	24376	0.61 (0.52, 0.72)

*denotes tibial components distributed by other companies

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