

# AOANJRR Automated Industry Report 334 - Depuy Synthes Australia

## Attune CR Total Knee

Data Period: 1 September 1999 - 17 August 2018

### 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	8129
Attune CR	150400123 - 150400226	CR Narrow Femoral Component	2324

**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	105	8129	15523	0.68 (0.55, 0.82)
150400123 - 150400226	27	2324	4439	0.61 (0.40, 0.89)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

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

	N
<b>Implant Usage</b>	
Date First Used	12 February 2013
Date Last Used	31 July 2018
N Procedures	10453
N Patients	9065
N Hospitals Implanting	139
N Surgeons Implanting*	180
<b>Outcome</b>	
N Revised	132
N Deceased**	90

\*418 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	10453	0.01	5.51	1.77	1.91	1.16
<b>TOTAL</b>	<b>10453</b>	<b>0.01</b>	<b>5.51</b>	<b>1.77</b>	<b>1.91</b>	<b>1.16</b>

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	4742	45.4%	32	93	68	67.7	8.8
Female	5711	54.6%	18	94	68	68.1	9.2
<b>TOTAL</b>	<b>10453</b>	<b>100.0%</b>	<b>18</b>	<b>94</b>	<b>68</b>	<b>67.9</b>	<b>9.0</b>

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

Age	Attune CR		Other Total Knee	
	N	Col%	N	Col%
<55	757	7.2	42291	6.8
55-64	2854	27.3	163420	26.3
65-74	4306	41.2	242646	39.1
≥75	2536	24.3	172291	27.8
<b>TOTAL</b>	<b>10453</b>	<b>100.0</b>	<b>620648</b>	<b>100.0</b>

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

Gender	Attune CR		Other Total Knee	
	N	Col%	N	Col%
Male	4742	45.4	269080	43.4
Female	5711	54.6	351568	56.6
<b>TOTAL</b>	<b>10453</b>	<b>100.0</b>	<b>620648</b>	<b>100.0</b>

**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	607	5.8	15433	6.1
2	5760	55.3	141274	55.8
3	3923	37.7	93547	37.0
4	117	1.1	2788	1.1
5	.	.	16	0.0
<b>TOTAL</b>	<b>10407</b>	<b>100.0</b>	<b>253058</b>	<b>100.0</b>

Note: The AOANJRR commenced collection of ASA data in 2013. 46 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)	19	0.2	342	0.2
Normal (18.50-24.99)	755	9.6	17142	10.5
Pre Obese (25.00-29.99)	2450	31.1	50979	31.2
Obese Class 1 (30.00-34.99)	2465	31.3	49891	30.5
Obese Class 2 (35.00-39.99)	1412	17.9	27605	16.9
Obese Class 3 (≥40.00)	784	9.9	17360	10.6
<b>TOTAL</b>	<b>7885</b>	<b>100.0</b>	<b>163319</b>	<b>100.0</b>

Note: The AOANJRR commenced collection of BMI data in 2015. 2568 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	10314	98.7	605975	97.6
Rheumatoid Arthritis	81	0.8	8186	1.3
Other Inflammatory Arthritis	30	0.3	3115	0.5
Osteonecrosis	27	0.3	1979	0.3
Tumour	.	.	777	0.1
Fracture	.	.	417	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	1	0.0	179	0.0
<b>TOTAL</b>	<b>10453</b>	<b>100.0</b>	<b>620648</b>	<b>100.0</b>

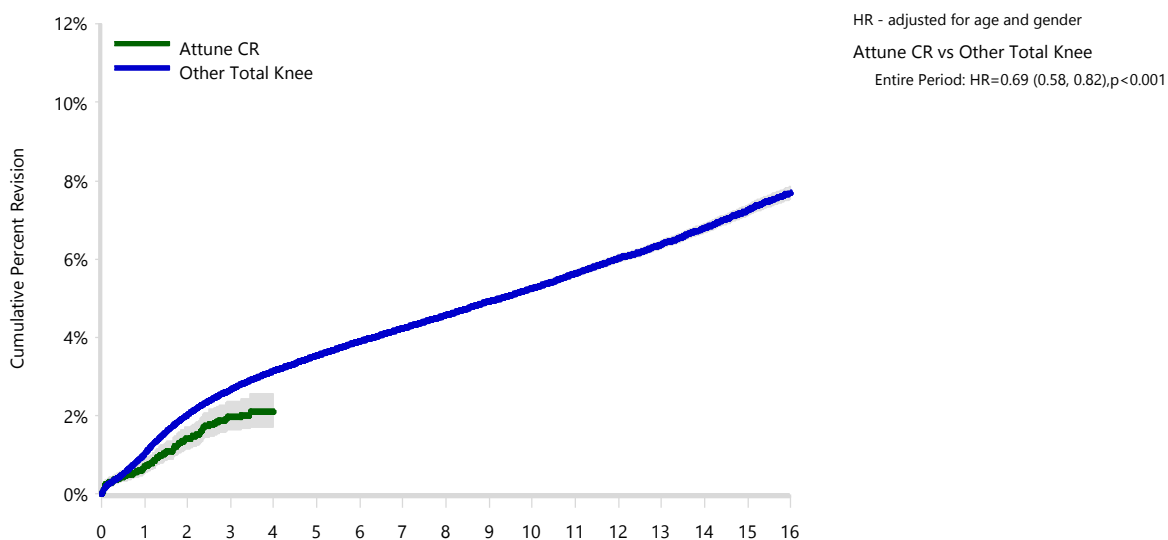
**Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)**

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune CR	132	10453	19962	0.66 (0.55, 0.78)
Other Total Knee	23965	620648	3911920	0.61 (0.60, 0.62)
<b>TOTAL</b>	<b>24097</b>	<b>631101</b>	<b>3931882</b>	<b>0.61 (0.61, 0.62)</b>

**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, 1.7)	2.0 (1.6, 2.4)	2.1 (1.7, 2.5)		
Other Total Knee	1.0 (1.0, 1.1)	2.0 (2.0, 2.1)	2.7 (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	
Attune CR						
Other Total Knee	3.9 (3.8, 4.0)	4.2 (4.2, 4.3)	4.6 (4.5, 4.6)	4.9 (4.9, 5.0)	5.2 (5.2, 5.3)	
CPR	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Attune CR						
Other Total Knee	5.6 (5.6, 5.7)	6.0 (5.9, 6.1)	6.4 (6.3, 6.5)	6.8 (6.7, 6.9)	7.2 (7.1, 7.4)	7.7 (7.5, 7.8)

**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	10453	7664	4604	2258	333	24	0	0	
Other Total Knee	620648	564608	503234	445420	391133	339272	290891	245575	
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	203794	165924	133204	103994	79071	57688	39539	24885	13271

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 5.5 Years)**

Revision Diagnosis	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	60	0.6	45.5	4866	0.8	25.8
Loosening	19	0.2	14.4	4452	0.7	23.6
Patellofemoral Pain	10	0.1	7.6	2011	0.3	10.6
Pain	6	0.1	4.5	1643	0.3	8.7
Instability	10	0.1	7.6	1519	0.2	8.0
Patella Erosion	8	0.1	6.1	912	0.1	4.8
Arthrofibrosis	8	0.1	6.1	763	0.1	4.0
Fracture	2	0.0	1.5	521	0.1	2.8
Malalignment	1	0.0	0.8	450	0.1	2.4
Metal Related Pathology	1	0.0	0.8	259	0.0	1.4
Incorrect Sizing	2	0.0	1.5	257	0.0	1.4
Lysis	1	0.0	0.8	176	0.0	0.9
Patella Maltracking	2	0.0	1.5	152	0.0	0.8
Bearing Dislocation				148	0.0	0.8
Wear Tibial Insert				141	0.0	0.7
Implant Breakage Patella				89	0.0	0.5
Implant Breakage Tibial Insert				65	0.0	0.3
Synovitis				63	0.0	0.3
Prosthesis Dislocation				55	0.0	0.3
Osteonecrosis				43	0.0	0.2
Implant Breakage Tibial				33	0.0	0.2
Implant Breakage Femoral				25	0.0	0.1
Tumour				16	0.0	0.1
Wear Patella				14	0.0	0.1
Wear Tibial				5	0.0	0.0
Heterotopic Bone				4	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	1.5	199	0.0	1.1
<b>N Revision</b>	<b>132</b>	<b>1.3</b>	<b>100.0</b>	<b>18886</b>	<b>3.0</b>	<b>100.0</b>
<b>N Primary</b>	<b>10453</b>			<b>620648</b>		

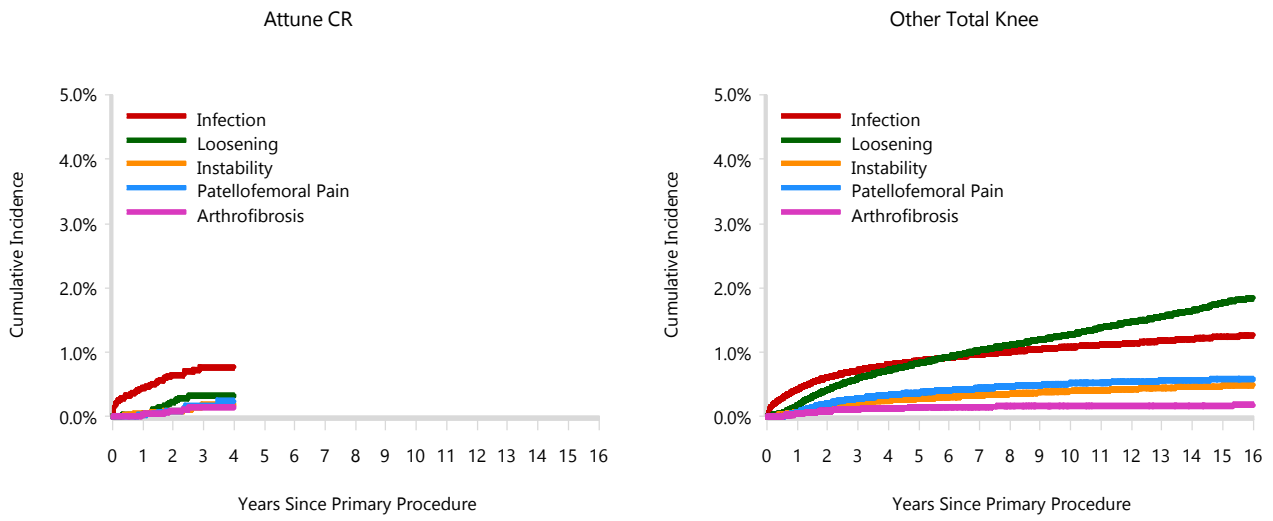
Note: This table is restricted to revisions within 5.5 years for all groups to allow a time-matched comparison of revisions.

**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	60	0.5 (0.3, 0.6)	0.6 (0.5, 0.8)	0.8 (0.6, 1.0)			
	Loosening	19	0.0 (0.0, 0.1)	0.2 (0.1, 0.4)	0.3 (0.2, 0.5)			
	Instability	10	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.2 (0.1, 0.4)			
	Patellofemoral Pain	10	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.2 (0.1, 0.3)			
	Arthrofibrosis	8	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.1 (0.1, 0.3)			
	Other	25	0.1 (0.1, 0.2)	0.3 (0.2, 0.4)	0.4 (0.2, 0.6)			
	Deceased	90	0.4 (0.3, 0.5)	0.9 (0.7, 1.2)	1.5 (1.2, 1.9)			
	All Revision	132	0.7 (0.6, 0.9)	1.4 (1.2, 1.7)	2.0 (1.6, 2.3)			
	Other Total Knee	Infection	5559	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		6048	0.2 (0.2, 0.2)	0.4 (0.4, 0.4)	0.6 (0.6, 0.6)	0.8 (0.8, 0.9)	1.3 (1.2, 1.3)	1.8 (1.7, 1.8)
Instability		1885	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)
Patellofemoral Pain		2408	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.5 (0.5, 0.5)	0.6 (0.6, 0.6)
Arthrofibrosis		830	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		7235	0.2 (0.2, 0.3)	0.5 (0.5, 0.5)	0.7 (0.7, 0.7)	1.0 (0.9, 1.0)	1.5 (1.5, 1.6)	2.1 (2.0, 2.2)
Deceased		85428	0.7 (0.7, 0.8)	1.8 (1.7, 1.8)	3.0 (3.0, 3.1)	6.5 (6.5, 6.6)	20.0 (19.8, 20.1)	36.5 (36.2, 36.8)
All Revision		23965	1.0 (1.0, 1.0)	2.0 (2.0, 2.0)	2.6 (2.6, 2.7)	3.5 (3.4, 3.5)	5.0 (4.9, 5.0)	6.4 (6.2, 6.5)



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 5.5 Years)**

Type of Revision	Number	Attune CR		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	58	0.6	43.9	4640	0.7	24.6
TKR (Tibial/Femoral)	23	0.2	17.4	4254	0.7	22.5
Patella Only	26	0.2	19.7	3992	0.6	21.1
Tibial Component	3	0.0	2.3	1856	0.3	9.8
Insert/Patella	6	0.1	4.5	1572	0.3	8.3
Femoral Component	5	0.0	3.8	1244	0.2	6.6
Cement Spacer	10	0.1	7.6	1128	0.2	6.0
Removal of Prostheses	1	0.0	0.8	122	0.0	0.6
Minor Components				48	0.0	0.3
Total Femoral				11	0.0	0.1
Cement Only				10	0.0	0.1
Reinsertion of Components				9	0.0	0.0
<b>N Revision</b>	<b>132</b>	<b>1.3</b>	<b>100.0</b>	<b>18886</b>	<b>3.0</b>	<b>100.0</b>
<b>N Primary</b>	<b>10453</b>			<b>620648</b>		

Note: This table is restricted to revisions within 5.5 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	132	10451	19960	0.66 (0.55, 0.78)
Hybrid (Tibial Cemented)	0	1	2	0.00 (0.00, 180.9)
Hybrid (Tibial Cementless)	0	1	0	0.00 (0.00, 3743)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

**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 + Antioxidant	132	10453	19962	0.66 (0.55, 0.78)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

**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	101	6767	13560	0.74 (0.61, 0.91)
Rotating	31	3686	6402	0.48 (0.33, 0.69)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

**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	77	6740	12588	0.61 (0.48, 0.76)
No Patella	55	3713	7374	0.75 (0.56, 0.97)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

**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	35	2218
2016	31	2485
2017	27	3162
2018	4	1586
<b>TOTAL</b>	<b>132</b>	<b>10453</b>

**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	132	10451	19957	0.66 (0.55, 0.78)
Custom Made (Depuy)	0	2	5	0.00 (0.00, 71.18)
<b>TOTAL</b>	<b>132</b>	<b>10453</b>	<b>19962</b>	<b>0.66 (0.55, 0.78)</b>

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