



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 9080 Depuy Synthes Australia Attune Total Knee

Report Generated: 8 February 2023

Data Period: 1 September 1999 - 7 February 2023

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 tibial 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.

**AOANJRR Automated Industry Report 9080 - Depuy Synthes Australia
Attune Total Knee**

Data Period: 1 September 1999 - 7 February 2023

Report Generated: 8 February 2023

Catalogue Numbers of Attune Tibial Components included in this analysis

Model	Catalogue Range	Range Description	No. of Primary Procedures
Attune	150670001 - 150670010	Tibial Base Fixed Bearing Cemented w S+ technology	9506
Attune	150680001 - 150680010	Tibial Baseplate Rotating Platform	9226

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

Model	Catalogue Range	Range Description
Attune	150600001 - 150600010	Fixed Tibial Baseplate
Attune	150610001 - 150610010	Rotating Tibial Baseplate
Attune	150611001 - 150611010	Rotating Tibial Baseplate Porocoat
Attune	150640002 - 150640010	Attune FB Cemented Revision Tibial Base
Attune	150660002 - 150660010	Revision Tibial Base Rotating Platform

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

Tibial Range	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150670001 - 150670010	141	9506	24327	0.58 (0.49, 0.68)
150680001 - 150680010	122	9226	19761	0.62 (0.51, 0.74)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

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

	N
Implant Usage	
Date First Used	17 January 2018
Date Last Used	23 December 2022
N Procedures	18732
N Patients	16092
N Hospitals Implanting	188
N Surgeons Implanting*	235
Outcome	
N Revised	263
N Deceased**	175

*123 Attune procedures have unknown surgeon

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

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

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune	18732	0.00	5.06	2.32	2.35	1.30
TOTAL	18732	0.00	5.06	2.32	2.35	1.30

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	8385	44.8%	29	95	69	68.4	8.7
Female	10347	55.2%	18	96	70	69.1	9.0
TOTAL	18732	100.0%	18	96	69	68.8	8.9

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

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	1081	5.8	58310	6.8
55-64	4683	25.0	228047	26.4
65-74	7799	41.6	343118	39.7
≥75	5169	27.6	233867	27.1
TOTAL	18732	100.0	863342	100.0

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

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	8385	44.8	380225	44.0
Female	10347	55.2	483117	56.0
TOTAL	18732	100.0	863342	100.0

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

ASA Grade	Attune		Other Total Knee	
	N	Col%	N	Col%
1	893	4.8	27827	5.6
2	10019	53.5	268410	54.2
3	7652	40.9	193740	39.1
4	161	0.9	5360	1.1
5	.	.	15	0.0
TOTAL	18725	100.0	495352	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 7 Attune 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		Other Total Knee	
	N	Col%	N	Col%
Underweight (<18.50)	40	0.2	821	0.2
Normal (18.50-24.99)	2024	10.9	42253	10.5
Pre Obese (25.00-29.99)	5908	31.8	125166	31.2
Obese Class 1 (30.00-34.99)	5852	31.5	123452	30.8
Obese Class 2 (35.00-39.99)	3133	16.9	67588	16.9
Obese Class 3 (\geq 40.00)	1614	8.7	41261	10.3
TOTAL	18571	100.0	400541	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 161 Attune procedures with no BMI recorded are excluded from this table

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

Primary Diagnosis	Attune		Other Total Knee	
	N	Col%	N	Col%
Osteoarthritis	18504	98.8	844213	97.8
Rheumatoid Arthritis	117	0.6	10081	1.2
Other Inflammatory Arthritis	56	0.3	4386	0.5
Osteonecrosis	46	0.2	2600	0.3
Tumour	1	0.0	1052	0.1
Fracture	4	0.0	747	0.1
Chondrocalcinosis	.	.	15	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	4	0.0	246	0.0
TOTAL	18732	100.0	863342	100.0

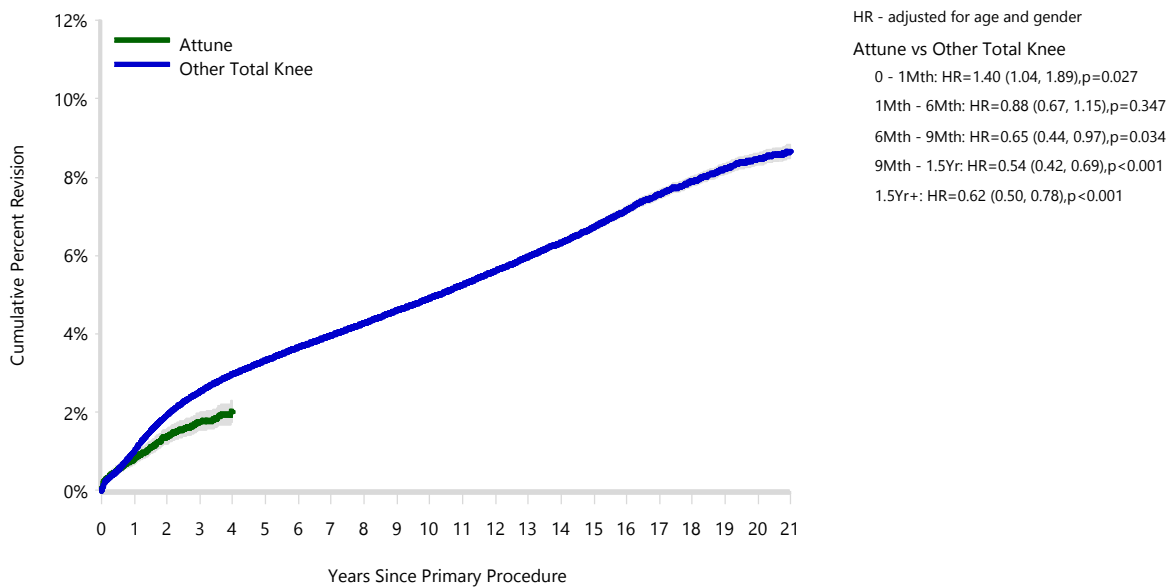
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	263	18732	44088	0.60 (0.53, 0.67)
Other Total Knee	35770	863342	6585115	0.54 (0.54, 0.55)
TOTAL	36033	882074	6629203	0.54 (0.54, 0.55)

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	6 Yrs	7 Yrs
Attune	0.8 (0.7, 0.9)	1.4 (1.2, 1.6)	1.7 (1.5, 2.0)	2.0 (1.8, 2.3)			
Other Total Knee	1.0 (1.0, 1.0)	1.9 (1.9, 2.0)	2.5 (2.5, 2.6)	3.0 (2.9, 3.0)	3.3 (3.3, 3.4)	3.7 (3.6, 3.7)	4.0 (3.9, 4.0)
CPR	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs
Attune							
Other Total Knee	4.3 (4.2, 4.3)	4.6 (4.5, 4.7)	4.9 (4.9, 5.0)	5.3 (5.2, 5.3)	5.6 (5.5, 5.7)	6.0 (5.9, 6.0)	6.3 (6.2, 6.4)
CPR	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Attune							
Other Total Knee	6.7 (6.6, 6.8)	7.2 (7.1, 7.3)	7.6 (7.5, 7.7)	7.9 (7.8, 8.0)	8.2 (8.1, 8.4)	8.5 (8.3, 8.6)	8.7 (8.5, 8.8)

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	8 Yrs	9 Yrs	10 Yrs
Attune	18732	14873	10806	6601	2175	15	0	0	0	0	0
Other Total Knee	863342	803005	736724	674744	611148	546984	482833	421762	364398	311464	262860
Number at Risk	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Attune	0	0	0	0	0	0	0	0	0	0	0
Other Total Knee	218663	178232	143116	113353	87210	65558	47715	32905	21243	12182	5326

TABLE 12

Reasons for Revision

This is reported in two ways: a percentage of primaries 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 primaries. 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 5.1 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	107	0.6	40.7	7127	0.8	28.2
Loosening	40	0.2	15.2	5553	0.6	22.0
Instability	34	0.2	12.9	2319	0.3	9.2
Patellofemoral Pain	5	0.0	1.9	2170	0.3	8.6
Pain	18	0.1	6.8	2086	0.2	8.3
Patella Erosion	8	0.0	3.0	1308	0.2	5.2
Arthrofibrosis	21	0.1	8.0	1132	0.1	4.5
Fracture	6	0.0	2.3	738	0.1	2.9
Malalignment	3	0.0	1.1	609	0.1	2.4
Incorrect Sizing	4	0.0	1.5	307	0.0	1.2
Metal Related Pathology				268	0.0	1.1
Patella Maltracking				220	0.0	0.9
Lysis				208	0.0	0.8
Bearing Dislocation	4	0.0	1.5	168	0.0	0.7
Wear Tibial Insert				161	0.0	0.6
Implant Breakage Patella				99	0.0	0.4
Implant Breakage Tibial Insert	1	0.0	0.4	90	0.0	0.4
Prosthesis Dislocation	1	0.0	0.4	86	0.0	0.3
Synovitis	1	0.0	0.4	81	0.0	0.3
Osteonecrosis	1	0.0	0.4	52	0.0	0.2
Implant Breakage Tibial				39	0.0	0.2
Implant Breakage Femoral				34	0.0	0.1
Tumour				28	0.0	0.1
Wear Patella				20	0.0	0.1
Heterotopic Bone				11	0.0	0.0
Wear Tibial				4	0.0	0.0
Incorrect Side				2	0.0	0.0
Patella Dislocation				2	0.0	0.0
Progression Of Disease				2	0.0	0.0
Wear Femoral				2	0.0	0.0
Other	9	0.0	3.4	311	0.0	1.2
N Revision	263	1.4	100.0	25237	2.9	100.0
N Primary	18732			863342		

Note: This table is restricted to revisions within 5.1 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	Infection	107	0.4 (0.3, 0.5)	0.6 (0.5, 0.7)	0.7 (0.6, 0.8)			
	Loosening	40	0.1 (0.0, 0.1)	0.2 (0.1, 0.2)	0.3 (0.2, 0.4)			
	Instability	34	0.1 (0.0, 0.1)	0.2 (0.1, 0.3)	0.2 (0.2, 0.3)			
	Patellofemoral Pain	5	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)			
	Pain	18	0.0 (0.0, 0.1)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)			
	Other	59	0.2 (0.1, 0.2)	0.3 (0.2, 0.4)	0.4 (0.3, 0.5)			
	Deceased	175	0.4 (0.3, 0.5)	0.8 (0.6, 0.9)	1.2 (1.0, 1.4)			
	All Revision	263	0.8 (0.7, 0.9)	1.4 (1.2, 1.6)	1.7 (1.5, 2.0)			
	Other Total Knee	Infection	8756	0.4 (0.4, 0.5)	0.6 (0.6, 0.6)	0.7 (0.7, 0.8)	0.9 (0.9, 0.9)	1.1 (1.1, 1.2)
Loosening		8580	0.2 (0.1, 0.2)	0.4 (0.4, 0.4)	0.5 (0.5, 0.5)	0.7 (0.7, 0.8)	1.1 (1.1, 1.2)	1.5 (1.5, 1.5)
Instability		3187	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		2823	0.1 (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)	0.4 (0.4, 0.5)
Pain		2765	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.2 (0.2, 0.2)	0.3 (0.3, 0.3)	0.4 (0.4, 0.4)	0.4 (0.4, 0.5)
Other		9659	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, 1.2)	1.7 (1.7, 1.8)
Deceased		15168 5	0.7 (0.7, 0.7)	1.6 (1.6, 1.6)	2.8 (2.8, 2.9)	6.0 (6.0, 6.1)	18.4 (18.3, 18.6)	34.9 (34.7, 35.1)
All Revision		35770	1.0 (1.0, 1.0)	1.9 (1.9, 1.9)	2.5 (2.5, 2.5)	3.3 (3.2, 3.3)	4.7 (4.6, 4.7)	6.0 (5.9, 6.0)

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

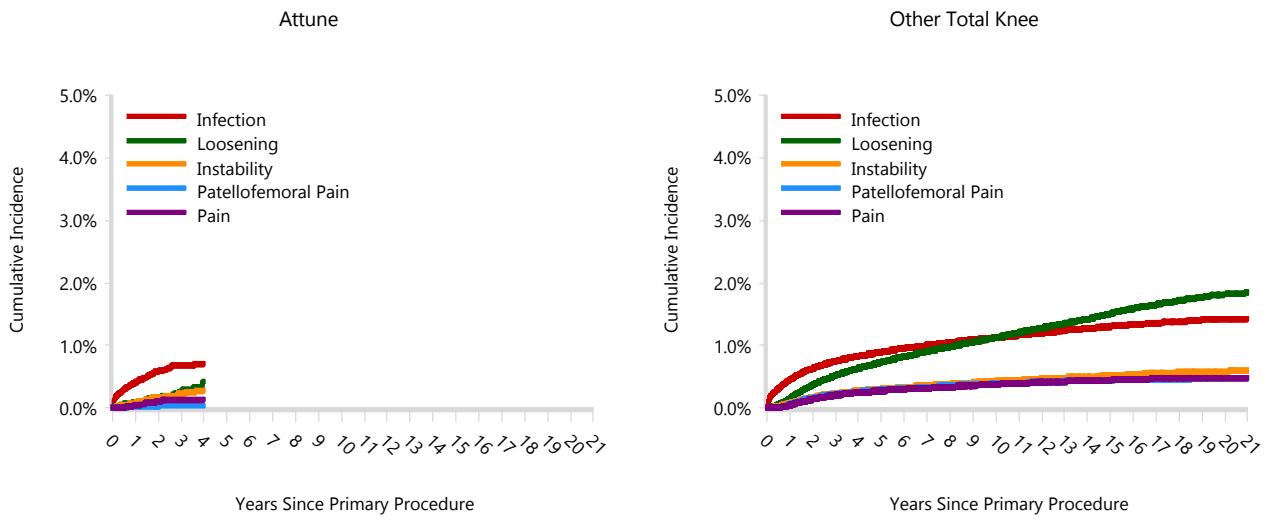


TABLE 14

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 5.1 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	136	0.7	51.7	7062	0.8	28.0
TKR (Tibial/Femoral)	49	0.3	18.6	5736	0.7	22.7
Patella Only	21	0.1	8.0	4968	0.6	19.7
Tibial Component	15	0.1	5.7	2232	0.3	8.8
Insert/Patella	15	0.1	5.7	2003	0.2	7.9
Femoral Component	16	0.1	6.1	1542	0.2	6.1
Cement Spacer	9	0.0	3.4	1417	0.2	5.6
Removal of Prostheses	2	0.0	0.8	165	0.0	0.7
Minor Components				64	0.0	0.3
Cement Only				17	0.0	0.1
Total Femoral				16	0.0	0.1
Reinsertion of Components				15	0.0	0.1
N Revision	263	1.4	100.0	25237	2.9	100.0
N Primary	18732			863342		

Note: This table is restricted to revisions within 5.1 years for all groups to allow a time-matched comparison of revisions.

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

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Cemented	251	17395	42357	0.59 (0.52, 0.67)
Cementless	0	1	0	0.00 (0.00, 1953)
Hybrid (Tibial Cemented)	12	1333	1729	0.69 (0.36, 1.21)
Hybrid (Tibial Cementless)	0	3	2	0.00 (0.00, 179.9)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 16: Revision Rates of Attune 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	263	18727	44075	0.60 (0.53, 0.67)
Unknown	0	5	13	0.00 (0.00, 28.64)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

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

Bearing Mobility	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Fixed	141	9486	24293	0.58 (0.49, 0.68)
Rotating	122	9241	19782	0.62 (0.51, 0.74)
Unknown	0	5	13	0.00 (0.00, 28.64)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

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

Stability	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Fully Stabilised	0	1	1	0.00 (0.00, 522.2)
Minimally Stabilised	178	12172	28733	0.62 (0.53, 0.72)
Posterior Stabilised	85	6531	15333	0.55 (0.44, 0.69)
Unknown	0	28	20	0.00 (0.00, 18.02)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 19: Revision Rates of Attune 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	220	16255	38281	0.57 (0.50, 0.66)
No Patella	43	2477	5807	0.74 (0.54, 1.00)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 20: Revision Rates of Attune Primary Total Knee Replacement by Computer Navigation (All Diagnoses)

Computer Navigation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Computer Navigated	115	8251	19610	0.59 (0.48, 0.70)
Non-Navigated	148	10481	24478	0.60 (0.51, 0.71)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 21: Revision Rates of Attune Primary Total Knee Replacement by IDI Usage (All Diagnoses)

IDI Usage	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
IDI Used	13	695	1808	0.72 (0.38, 1.23)
IDI Not Used	250	18037	42280	0.59 (0.52, 0.67)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 22: Revision Rates of Attune Primary Total Knee Replacement by Robotic Assistance (All Diagnoses)

Robotic Assistance	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Robotically Assisted	0	185	86	0.00 (0.00, 4.30)
Non-Robotic	263	18547	44002	0.60 (0.53, 0.67)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

Table 23: Number of Revisions of Attune Primary Total Knee Replacement by Year of Implant (All Diagnoses)

Year of Implant	Number Revised	Total Number
2018	57	1972
2019	92	4457
2020	67	4255
2021	29	4192
2022	18	3856
TOTAL	263	18732

Table 24: Revision Rates of Attune Primary Total Knee Replacement by Femoral Component (All Diagnoses)

Femoral	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune CR	179	12199	28754	0.62 (0.53, 0.72)
Attune CRS	0	12	26	0.00 (0.00, 14.01)
Attune PS	84	6520	15306	0.55 (0.44, 0.68)
Other Femoral Components*	0	1	2	0.00 (0.00, 209.2)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)

*denotes femoral components distributed by other companies

Table 25: Revision Rates of Attune Primary Total Knee Replacement by Tibial Catalogue Number (All Diagnoses)

Tibial Catalogue Number	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150670001	0	8	13	0.00 (0.00, 28.52)
150670002	1	80	203	0.49 (0.01, 2.75)
150670003	10	786	2020	0.49 (0.24, 0.91)
150670004	27	1889	4909	0.55 (0.36, 0.80)
150670005	31	2080	5347	0.58 (0.39, 0.82)
150670006	24	1515	3853	0.62 (0.40, 0.93)
150670007	23	1584	4051	0.57 (0.36, 0.85)
150670008	10	1163	2933	0.34 (0.16, 0.63)
150670009	11	328	817	1.35 (0.67, 2.41)
150670010	4	73	181	2.21 (0.60, 5.65)
150680001	0	1	2	0.00 (0.00, 191.4)
150680002	2	81	137	1.46 (0.18, 5.26)
150680003	5	672	1379	0.36 (0.12, 0.85)
150680004	13	1822	3804	0.34 (0.18, 0.58)
150680005	28	1999	4228	0.66 (0.44, 0.96)
150680006	21	1488	3139	0.67 (0.41, 1.02)
150680007	26	1477	3237	0.80 (0.52, 1.18)
150680008	17	1165	2609	0.65 (0.38, 1.04)
150680009	9	446	1040	0.87 (0.40, 1.64)
150680010	1	75	184	0.54 (0.01, 3.03)
TOTAL	263	18732	44088	0.60 (0.53, 0.67)