



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 5901

Depuy Synthes Australia

Attune Total Knee

Report Generated: 8 February 2022

Data Period: 1 September 1999 - 4 February 2022

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.

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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	7643
Attune	150680001 - 150680010	Tibial Baseplate Rotating Platform	6930

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	108	7643	15659	0.69 (0.57, 0.83)
150680001 - 150680010	82	6930	11511	0.71 (0.57, 0.88)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	10 January 2022
N Procedures	14573
N Patients	12560
N Hospitals Implanting	171
N Surgeons Implanting*	206
Outcome	
N Revised	190
N Deceased**	135

*97 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	14573	0.01	4.05	1.87	1.86	1.00
TOTAL	14573	0.01	4.05	1.87	1.86	1.00

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	6599	45.3%	30	95	68	68.2	8.7
Female	7974	54.7%	18	96	70	69.0	9.0
TOTAL	14573	100.0%	18	96	69	68.7	8.9

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

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	845	5.8	54854	6.8
55-64	3698	25.4	214547	26.4
65-74	6150	42.2	321851	39.7
≥75	3880	26.6	219944	27.1
TOTAL	14573	100.0	811196	100.0

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

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	6599	45.3	356171	43.9
Female	7974	54.7	455025	56.1
TOTAL	14573	100.0	811196	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	716	4.9	25418	5.7
2	7930	54.4	241552	54.5
3	5801	39.8	171503	38.7
4	122	0.8	4809	1.1
5	.	.	14	0.0
TOTAL	14569	100.0	443296	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 4 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)	31	0.2	714	0.2
Normal (18.50-24.99)	1533	10.6	36598	10.5
Pre Obese (25.00-29.99)	4551	31.5	108658	31.2
Obese Class 1 (30.00-34.99)	4545	31.5	107460	30.8
Obese Class 2 (35.00-39.99)	2467	17.1	59085	16.9
Obese Class 3 (\geq 40.00)	1309	9.1	36264	10.4
TOTAL	14436	100.0	348779	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 137 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	14417	98.9	792923	97.7
Rheumatoid Arthritis	76	0.5	9742	1.2
Other Inflammatory Arthritis	40	0.3	4121	0.5
Osteonecrosis	32	0.2	2474	0.3
Tumour	1	0.0	991	0.1
Fracture	3	0.0	678	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	3	0.0
Other	4	0.0	246	0.0
TOTAL	14573	100.0	811196	100.0

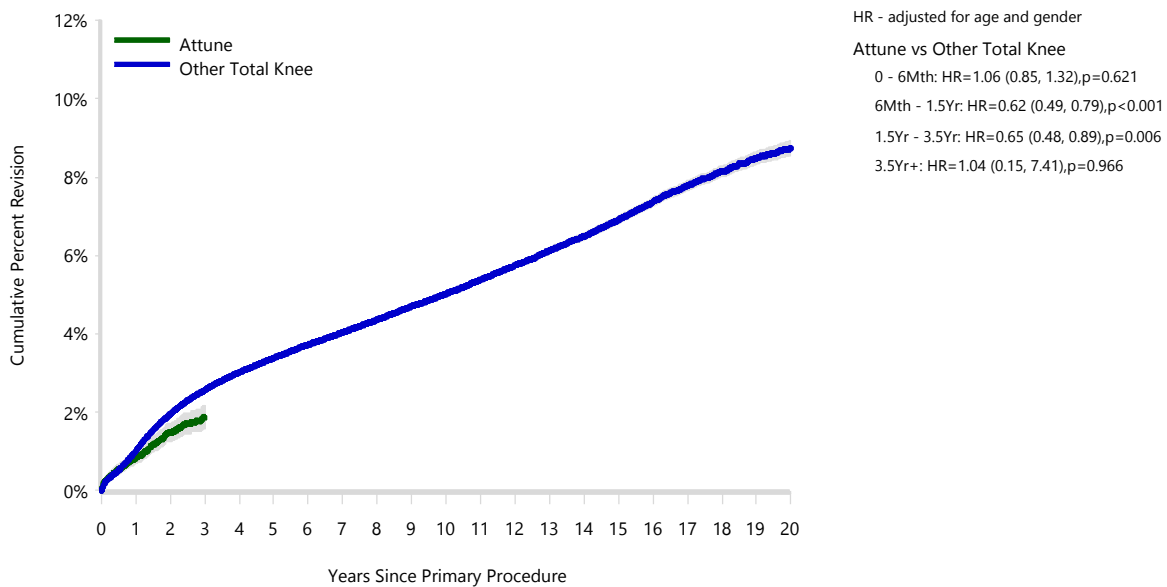
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	190	14573	27170	0.70 (0.60, 0.81)
Other Total Knee	33342	811196	5923653	0.56 (0.56, 0.57)
TOTAL	33532	825769	5950823	0.56 (0.56, 0.57)

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	
Attune	0.8 (0.7, 1.0)	1.5 (1.3, 1.7)	1.9 (1.6, 2.2)				
Other Total Knee	1.0 (1.0, 1.0)	2.0 (1.9, 2.0)	2.6 (2.5, 2.6)	3.0 (3.0, 3.1)	3.4 (3.3, 3.4)	3.7 (3.7, 3.8)	
CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs
Attune							
Other Total Knee	4.0 (4.0, 4.1)	4.4 (4.3, 4.4)	4.7 (4.6, 4.8)	5.0 (5.0, 5.1)	5.4 (5.3, 5.4)	5.8 (5.7, 5.8)	6.1 (6.0, 6.2)
CPR	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs
Attune							
Other Total Knee	6.5 (6.4, 6.6)	6.9 (6.8, 7.0)	7.4 (7.3, 7.5)	7.8 (7.7, 7.9)	8.2 (8.0, 8.3)	8.5 (8.3, 8.7)	8.7 (8.5, 8.9)

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	
Attune	14573	10898	6631	2161	8	0	0	0	0	0	
Other Total Knee	811196	750700	687392	623612	559459	495740	434844	376848	323419	274209	
Number at Risk	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs
Attune	0	0	0	0	0	0	0	0	0	0	0
Other Total Knee	229282	187931	151473	120316	93076	70191	51255	35391	22816	13023	5588

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 4 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	82	0.6	43.2	6268	0.8	28.6
Loosening	27	0.2	14.2	4736	0.6	21.6
Instability	22	0.2	11.6	1987	0.2	9.1
Patellofemoral Pain	4	0.0	2.1	1967	0.2	9.0
Pain	14	0.1	7.4	1840	0.2	8.4
Patella Erosion	7	0.0	3.7	1085	0.1	4.9
Arthrofibrosis	11	0.1	5.8	992	0.1	4.5
Fracture	6	0.0	3.2	614	0.1	2.8
Malalignment	2	0.0	1.1	537	0.1	2.4
Incorrect Sizing	3	0.0	1.6	289	0.0	1.3
Metal Related Pathology				206	0.0	0.9
Patella Maltracking				198	0.0	0.9
Lysis				173	0.0	0.8
Bearing Dislocation	2	0.0	1.1	160	0.0	0.7
Wear Tibial Insert				123	0.0	0.6
Implant Breakage Patella				77	0.0	0.4
Prosthesis Dislocation				76	0.0	0.3
Synovitis	1	0.0	0.5	76	0.0	0.3
Implant Breakage Tibial Insert	1	0.0	0.5	70	0.0	0.3
Osteonecrosis	1	0.0	0.5	46	0.0	0.2
Implant Breakage Tibial				34	0.0	0.2
Implant Breakage Femoral				28	0.0	0.1
Tumour				25	0.0	0.1
Wear Patella				10	0.0	0.0
Heterotopic Bone				8	0.0	0.0
Wear Tibial				3	0.0	0.0
Incorrect Side				2	0.0	0.0
Progression Of Disease				2	0.0	0.0
Wear Femoral				2	0.0	0.0
Osteoarthritis				1	0.0	0.0
Patella Dislocation				1	0.0	0.0
Post Operative Haematoma				1	0.0	0.0
Other	7	0.0	3.7	284	0.0	1.3
N Revision	190	1.3	100.0	21921	2.7	100.0
N Primary	14573			811196		

Note: This table is restricted to revisions within 4 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	82	0.4 (0.3, 0.5)	0.6 (0.5, 0.8)	0.7 (0.6, 0.9)			
	Loosening	27	0.1 (0.0, 0.1)	0.2 (0.1, 0.2)	0.3 (0.2, 0.5)			
	Instability	22	0.1 (0.0, 0.1)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)			
	Patellofemoral Pain	4	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)			
	Pain	14	0.0 (0.0, 0.1)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)			
	Other	41	0.2 (0.1, 0.3)	0.3 (0.2, 0.5)	0.4 (0.3, 0.5)			
	Deceased	135	0.4 (0.3, 0.5)	0.9 (0.7, 1.1)	1.6 (1.3, 1.9)			
	All Revision	190	0.8 (0.7, 1.0)	1.5 (1.3, 1.7)	1.9 (1.6, 2.2)			
	Other Total Knee	Infection	8061	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, 1.1)
Loosening		8057	0.2 (0.1, 0.2)	0.4 (0.4, 0.4)	0.5 (0.5, 0.6)	0.8 (0.7, 0.8)	1.2 (1.1, 1.2)	1.6 (1.5, 1.6)
Instability		2948	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		2740	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)
Pain		2635	0.0 (0.0, 0.0)	0.1 (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)
Other		8901	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		14549 0	0.7 (0.7, 0.7)	1.7 (1.7, 1.7)	3.0 (2.9, 3.0)	6.4 (6.3, 6.4)	19.7 (19.6, 19.8)	37.7 (37.5, 37.9)
All Revision		33342	1.0 (1.0, 1.0)	1.9 (1.9, 2.0)	2.5 (2.5, 2.6)	3.3 (3.3, 3.4)	4.7 (4.7, 4.8)	6.1 (6.0, 6.1)

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

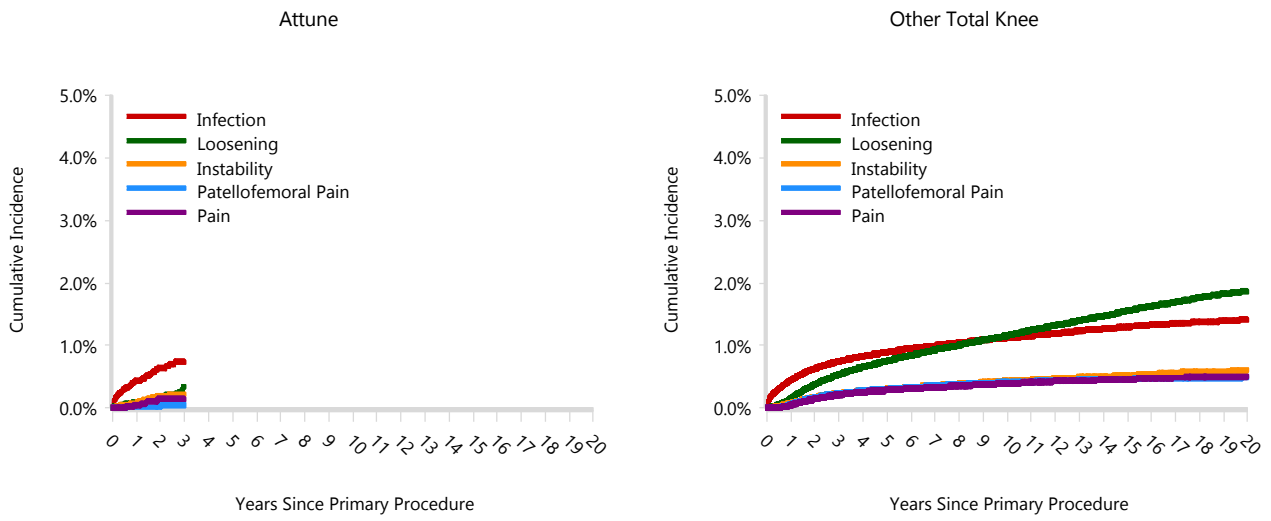


TABLE 14

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 4 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	98	0.7	51.6	6203	0.8	28.3
TKR (Tibial/Femoral)	38	0.3	20.0	4761	0.6	21.7
Patella Only	17	0.1	8.9	4367	0.5	19.9
Tibial Component	11	0.1	5.8	1983	0.2	9.0
Insert/Patella	13	0.1	6.8	1685	0.2	7.7
Femoral Component	5	0.0	2.6	1407	0.2	6.4
Cement Spacer	6	0.0	3.2	1277	0.2	5.8
Removal of Prostheses	2	0.0	1.1	144	0.0	0.7
Minor Components				57	0.0	0.3
Reinsertion of Components				14	0.0	0.1
Total Femoral				12	0.0	0.1
Cement Only				11	0.0	0.1
N Revision	190	1.3	100.0	21921	2.7	100.0
N Primary	14573			811196		

Note: This table is restricted to revisions within 4 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	185	13861	26539	0.70 (0.60, 0.81)
Hybrid (Tibial Cemented)	5	710	630	0.79 (0.26, 1.85)
Hybrid (Tibial Cementless)	0	2	1	0.00 (0.00, 356.4)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	190	14570	27163	0.70 (0.60, 0.81)
Unknown	0	3	7	0.00 (0.00, 56.38)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	108	7622	15645	0.69 (0.57, 0.83)
Rotating	82	6948	11519	0.71 (0.57, 0.88)
Unknown	0	3	7	0.00 (0.00, 56.38)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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)
Minimally Stabilised	126	9506	17721	0.71 (0.59, 0.85)
Posterior Stabilised	64	5064	9443	0.68 (0.52, 0.87)
Unknown	0	3	7	0.00 (0.00, 56.38)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	159	12744	23530	0.68 (0.57, 0.79)
No Patella	31	1829	3640	0.85 (0.58, 1.21)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	84	6588	12114	0.69 (0.55, 0.86)
Non-Navigated	106	7985	15056	0.70 (0.58, 0.85)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	9	608	1167	0.77 (0.35, 1.46)
IDI Not Used	181	13965	26003	0.70 (0.60, 0.81)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	3	6	0.00 (0.00, 63.35)
Non-Robotic	190	14570	27164	0.70 (0.60, 0.81)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	52	1972
2019	79	4457
2020	47	4251
2021	12	3892
2022	0	1
TOTAL	190	14573

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	127	9514	17731	0.72 (0.60, 0.85)
Attune CRS	0	9	15	0.00 (0.00, 24.23)
Attune PS	63	5050	9424	0.67 (0.51, 0.86)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)

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	4	7	0.00 (0.00, 49.50)
150670002	1	63	129	0.78 (0.02, 4.32)
150670003	6	634	1309	0.46 (0.17, 1.00)
150670004	22	1509	3189	0.69 (0.43, 1.04)
150670005	22	1658	3447	0.64 (0.40, 0.97)
150670006	17	1220	2474	0.69 (0.40, 1.10)
150670007	20	1263	2611	0.77 (0.47, 1.18)
150670008	9	961	1853	0.49 (0.22, 0.92)
150670009	8	269	523	1.53 (0.66, 3.01)
150670010	3	62	116	2.59 (0.53, 7.58)
150680001	0	1	1	0.00 (0.00, 401.0)
150680002	1	50	69	1.46 (0.04, 8.13)
150680003	4	487	778	0.51 (0.14, 1.32)
150680004	8	1342	2174	0.37 (0.16, 0.73)
150680005	19	1462	2459	0.77 (0.47, 1.21)
150680006	12	1118	1818	0.66 (0.34, 1.15)
150680007	16	1130	1919	0.83 (0.48, 1.35)
150680008	14	919	1550	0.90 (0.49, 1.52)
150680009	7	362	630	1.11 (0.45, 2.29)
150680010	1	59	114	0.87 (0.02, 4.87)
TOTAL	190	14573	27170	0.70 (0.60, 0.81)