



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 4292

Depuy Synthes Australia

Attune Total Knee

Report Generated: 28 May 2021

Data Period: 1 September 1999 - 26 May 2021

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 4292 - Depuy Synthes Australia**Attune Total Knee**

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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	6289
Attune	150680001 - 150680010	Tibial Baseplate Rotating Platform	5373

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	150611002 - 150611010	Rotating Tibial Baseplate Porocoat
Attune	150640002 - 150640010	Attune FB Cemented Revision Tibial Base
Attune	150660002 - 150660009	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	89	6289	10658	0.84 (0.67, 1.03)
150680001 - 150680010	52	5373	6988	0.74 (0.56, 0.98)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	26 April 2021
N Procedures	11662
N Patients	10079
N Hospitals Implanting	152
N Surgeons Implanting*	186
Outcome	
N Revised	141
N Deceased**	81

*74 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	11662	0.01	3.35	1.52	1.51	0.83
TOTAL	11662	0.01	3.35	1.52	1.51	0.83

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	5249	45.0%	30	95	68	68.2	8.7
Female	6413	55.0%	18	96	69	68.9	9.0
TOTAL	11662	100.0%	18	96	69	68.6	8.9

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

Age	Attune		Other Total Knee	
	N	Col%	N	Col%
<55	683	5.9	52070	6.8
55-64	2972	25.5	203549	26.4
65-74	4953	42.5	304689	39.6
≥75	3054	26.2	209662	27.2
TOTAL	11662	100.0	769970	100.0

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

Gender	Attune		Other Total Knee	
	N	Col%	N	Col%
Male	5249	45.0	337103	43.8
Female	6413	55.0	432867	56.2
TOTAL	11662	100.0	769970	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	581	5.0	23495	5.8
2	6464	55.4	219921	54.7
3	4509	38.7	154301	38.4
4	106	0.9	4388	1.1
5	.	.	11	0.0
TOTAL	11660	100.0	402116	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 2 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)	29	0.3	639	0.2
Normal (18.50-24.99)	1238	10.7	32264	10.5
Pre Obese (25.00-29.99)	3645	31.6	95939	31.2
Obese Class 1 (30.00-34.99)	3597	31.1	94759	30.8
Obese Class 2 (35.00-39.99)	1976	17.1	52129	16.9
Obese Class 3 (\geq 40.00)	1065	9.2	32173	10.4
TOTAL	11550	100.0	307903	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 112 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	11543	99.0	752437	97.7
Rheumatoid Arthritis	59	0.5	9448	1.2
Other Inflammatory Arthritis	27	0.2	3881	0.5
Osteonecrosis	28	0.2	2369	0.3
Tumour	.	.	953	0.1
Fracture	2	0.0	632	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	3	0.0	230	0.0
TOTAL	11662	100.0	769970	100.0

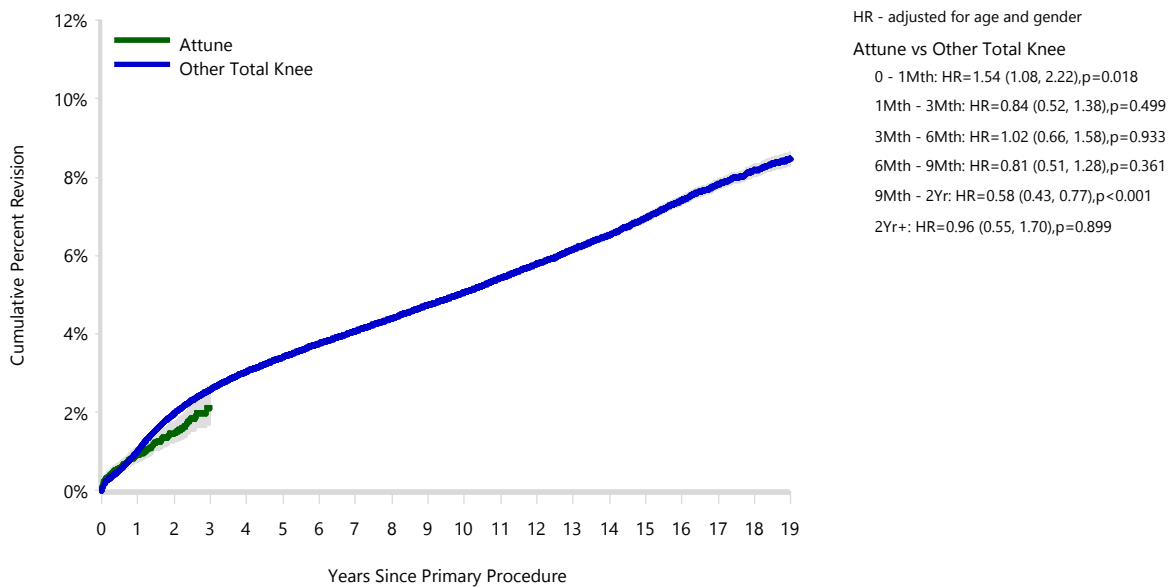
Table 10: Revision Rates of Primary Total Knee Replacement by Model (All Diagnoses)

Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	141	11662	17646	0.80 (0.67, 0.94)
Other Total Knee	31354	769970	5489525	0.57 (0.56, 0.58)
TOTAL	31495	781632	5507171	0.57 (0.57, 0.58)

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	0.9 (0.7, 1.1)	1.5 (1.2, 1.8)	2.1 (1.7, 2.7)				
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 (3.4, 3.4)	3.8 (3.7, 3.8)	
CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	
Attune							
Other Total Knee	4.1 (4.0, 4.1)	4.4 (4.3, 4.4)	4.7 (4.7, 4.8)	5.1 (5.0, 5.1)	5.4 (5.4, 5.5)	5.8 (5.7, 5.9)	
CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs
Attune							
Other Total Knee	6.2 (6.1, 6.2)	6.5 (6.4, 6.6)	7.0 (6.9, 7.1)	7.4 (7.3, 7.5)	7.8 (7.7, 7.9)	8.2 (8.0, 8.3)	8.5 (8.3, 8.6)

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	11662	7649	3523	535	0	0	0	0	0	0
Other Total Knee	769970	712698	652569	589389	525125	462847	404000	348846	297986	251320
Number at Risk	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs
Attune	0	0	0	0	0	0	0	0	0	0
Other Total Knee	207919	169225	135501	106210	81246	60203	42692	28243	17086	8335

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 3.4 Years)

Revision Diagnosis	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	62	0.5	44.0	5615	0.7	29.2
Loosening	15	0.1	10.6	4094	0.5	21.3
Patellofemoral Pain	4	0.0	2.8	1780	0.2	9.2
Instability	19	0.2	13.5	1723	0.2	9.0
Pain	13	0.1	9.2	1598	0.2	8.3
Patella Erosion	6	0.1	4.3	916	0.1	4.8
Arthrofibrosis	5	0.0	3.5	868	0.1	4.5
Fracture	5	0.0	3.5	542	0.1	2.8
Malalignment	2	0.0	1.4	468	0.1	2.4
Incorrect Sizing	2	0.0	1.4	271	0.0	1.4
Patella Maltracking				167	0.0	0.9
Metal Related Pathology				158	0.0	0.8
Bearing Dislocation	1	0.0	0.7	151	0.0	0.8
Lysis				135	0.0	0.7
Wear Tibial Insert				106	0.0	0.6
Prosthesis Dislocation				67	0.0	0.3
Synovitis	1	0.0	0.7	66	0.0	0.3
Implant Breakage Patella				65	0.0	0.3
Implant Breakage Tibial Insert	1	0.0	0.7	60	0.0	0.3
Osteonecrosis				46	0.0	0.2
Implant Breakage Tibial				30	0.0	0.2
Implant Breakage Femoral				24	0.0	0.1
Tumour				20	0.0	0.1
Heterotopic Bone				6	0.0	0.0
Wear Patella				6	0.0	0.0
Wear Tibial				3	0.0	0.0
Incorrect Side				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
Progression Of Disease				1	0.0	0.0
Wear Femoral				1	0.0	0.0
Other	5	0.0	3.5	254	0.0	1.3
N Revision	141	1.2	100.0	19246	2.5	100.0
N Primary	11662			769970		

Note: This table is restricted to revisions within 3.4 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	Loosening	15	0.1 (0.0, 0.2)	0.1 (0.1, 0.2)	0.4 (0.1, 0.8)			
	Infection	62	0.5 (0.3, 0.6)	0.6 (0.5, 0.8)	0.8 (0.6, 1.1)			
	Instability	19	0.1 (0.0, 0.2)	0.2 (0.1, 0.3)	0.3 (0.2, 0.5)			
	Patellofemoral Pain	4	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)			
	Pain	13	0.1 (0.0, 0.1)	0.2 (0.1, 0.3)	0.2 (0.1, 0.3)			
	Other	28	0.2 (0.1, 0.3)	0.3 (0.2, 0.4)	0.4 (0.2, 0.6)			
	Deceased	81	0.4 (0.3, 0.5)	0.8 (0.6, 1.0)	1.5 (1.1, 2.0)			
	All Revision	141	0.9 (0.7, 1.1)	1.5 (1.2, 1.7)	2.1 (1.7, 2.6)			
	Other Total Knee	Loosening	7655	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 (1.2, 1.2)
Infection		7556	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)	1.3 (1.3, 1.3)
Instability		2730	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		2685	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)
Pain		2491	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		8237	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		13360 9	0.7 (0.7, 0.7)	1.7 (1.7, 1.8)	3.0 (3.0, 3.0)	6.4 (6.4, 6.5)	20.0 (19.9, 20.1)	38.1 (37.9, 38.3)
All Revision		31354	1.0 (1.0, 1.0)	1.9 (1.9, 2.0)	2.5 (2.5, 2.6)	3.3 (3.3, 3.4)	4.8 (4.7, 4.8)	6.1 (6.0, 6.2)

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

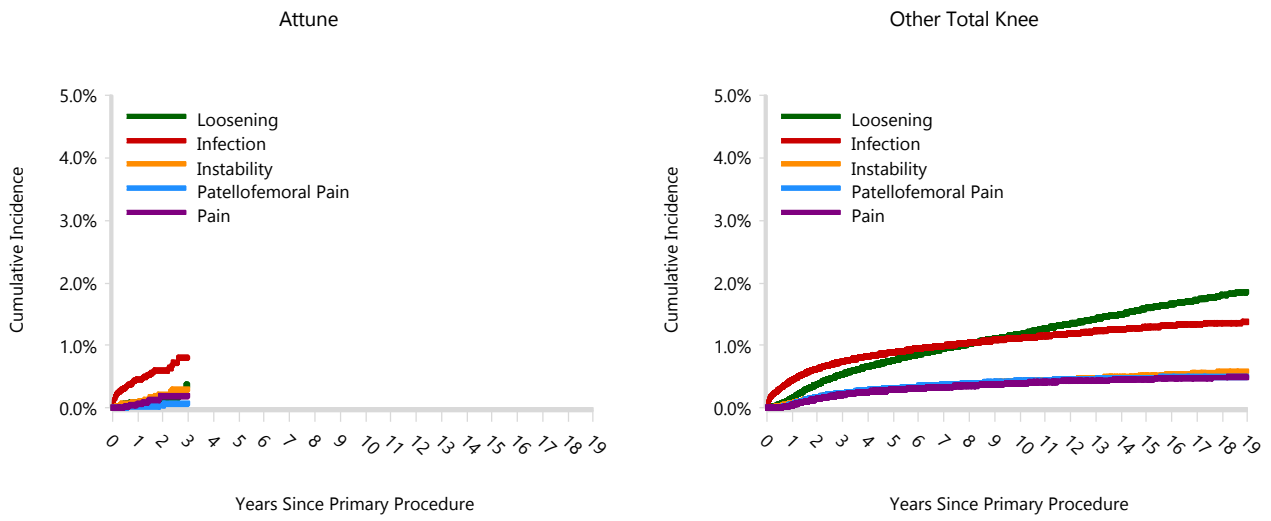


TABLE 14

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 3.4 Years)

Type of Revision	Number	Attune		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	78	0.7	55.3	5519	0.7	28.7
TKR (Tibial/Femoral)	25	0.2	17.7	4033	0.5	21.0
Patella Only	14	0.1	9.9	3832	0.5	19.9
Tibial Component	7	0.1	5.0	1760	0.2	9.1
Insert/Patella	11	0.1	7.8	1463	0.2	7.6
Femoral Component	2	0.0	1.4	1279	0.2	6.6
Cement Spacer	2	0.0	1.4	1144	0.1	5.9
Removal of Prostheses	2	0.0	1.4	133	0.0	0.7
Minor Components				49	0.0	0.3
Reinsertion of Components				12	0.0	0.1
Total Femoral				12	0.0	0.1
Cement Only				10	0.0	0.1
N Revision	141	1.2	100.0	19246	2.5	100.0
N Primary	11662			769970		

Note: This table is restricted to revisions within 3.4 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	138	11407	17441	0.79 (0.66, 0.93)
Hybrid (Tibial Cemented)	3	255	206	1.46 (0.30, 4.26)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	141	11660	17641	0.80 (0.67, 0.94)
Unknown	0	2	5	0.00 (0.00, 76.77)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	89	6287	10655	0.84 (0.67, 1.03)
Rotating	52	5373	6986	0.74 (0.56, 0.98)
Unknown	0	2	5	0.00 (0.00, 76.77)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	99	7644	11503	0.86 (0.70, 1.05)
Posterior Stabilised	42	4016	6139	0.68 (0.49, 0.92)
Unknown	0	2	5	0.00 (0.00, 76.77)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	112	10214	15184	0.74 (0.61, 0.89)
No Patella	29	1448	2462	1.18 (0.79, 1.69)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	62	5225	7823	0.79 (0.61, 1.02)
Non-Navigated	79	6437	9823	0.80 (0.64, 1.00)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	4	529	760	0.53 (0.14, 1.35)
IDI Not Used	137	11133	16886	0.81 (0.68, 0.96)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	4	6	0.00 (0.00, 63.29)
Non-Robotic	141	11658	17640	0.80 (0.67, 0.94)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	49	1972
2019	59	4455
2020	31	4236
2021	2	999
TOTAL	141	11662

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	0	9	9	0.00 (0.00, 41.14)
Attune CR	99	7647	11508	0.86 (0.70, 1.05)
Attune PS	42	4006	6129	0.69 (0.49, 0.93)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)

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	3	5	0.00 (0.00, 72.99)
150670002	1	53	88	1.13 (0.03, 6.31)
150670003	6	508	891	0.67 (0.25, 1.47)
150670004	18	1254	2192	0.82 (0.49, 1.30)
150670005	18	1383	2361	0.76 (0.45, 1.20)
150670006	14	1002	1681	0.83 (0.46, 1.40)
150670007	17	1044	1787	0.95 (0.55, 1.52)
150670008	7	769	1228	0.57 (0.23, 1.17)
150670009	6	226	350	1.71 (0.63, 3.73)
150670010	2	47	76	2.64 (0.32, 9.55)
150680001	0	1	0	0.00 (0.00, 1643)
150680002	1	40	36	2.77 (0.07, 15.42)
150680003	2	376	458	0.44 (0.05, 1.58)
150680004	6	1023	1293	0.46 (0.17, 1.01)
150680005	13	1155	1505	0.86 (0.46, 1.48)
150680006	8	857	1092	0.73 (0.32, 1.44)
150680007	8	878	1182	0.68 (0.29, 1.33)
150680008	8	702	952	0.84 (0.36, 1.66)
150680009	6	291	394	1.52 (0.56, 3.31)
150680010	0	50	76	0.00 (0.00, 4.88)
TOTAL	141	11662	17646	0.80 (0.67, 0.94)