



Australian
Orthopaedic
Association
National
Joint
Replacement
Registry

Automated Industry Report 6704 Depuy Synthes Australia Attune PS Total Knee

Report Generated: 31 May 2022

Data Period: 1 September 1999 - 30 May 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 PS femoral 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.

098058-220821 DSUS/EMEA

**AOANJRR Automated Industry Report 6704 - Depuy Synthes Australia
Attune PS Total Knee**

Data Period: 1 September 1999 - 30 May 2022

Report Generated: 31 May 2022

Catalogue Numbers of Attune PS Femoral Components included in this analysis

Model	Catalogue Range	Range Description	No. of Primary Procedures
Attune PS	150410101 - 150410210	PS Femoral Component	8655
Attune PS	150410123 - 150410226	PS Narrow Femoral Component	2803

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

Model	Catalogue Range	Range Description
Attune PS	150411102 - 150411210	PS Femoral Component Porocoat
Attune PS	150411123 - 150411226	PS Narrow Femoral Component Porocoat

Table 1: Revision Rates of Attune PS 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)
150410101 - 150410210	176	8655	29742	0.59 (0.51, 0.69)
150410123 - 150410226	44	2803	9361	0.47 (0.34, 0.63)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

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

	N
Implant Usage	
Date First Used	13 March 2013
Date Last Used	29 April 2022
N Procedures	11458
N Patients	9688
N Hospitals Implanting	144
N Surgeons Implanting*	210
Outcome	
N Revised	220
N Deceased**	393

*351 Attune PS procedures have unknown surgeon

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

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

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune PS	11458	0.00	9.18	3.06	3.41	2.23
TOTAL	11458	0.00	9.18	3.06	3.41	2.23

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	4834	42.2%	31	95	68	68.2	9.0
Female	6624	57.8%	33	97	69	69.0	9.2
TOTAL	11458	100.0%	31	97	69	68.7	9.1

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

Age	Attune PS		Other Total Knee	
	N	Col%	N	Col%
<55	753	6.6	56001	6.8
55-64	2875	25.1	219178	26.4
65-74	4701	41.0	329341	39.7
≥75	3129	27.3	224631	27.1
TOTAL	11458	100.0	829151	100.0

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

Gender	Attune PS		Other Total Knee	
	N	Col%	N	Col%
Male	4834	42.2	364708	44.0
Female	6624	57.8	464443	56.0
TOTAL	11458	100.0	829151	100.0

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

ASA Grade	Attune PS		Other Total Knee	
	N	Col%	N	Col%
1	592	5.2	26244	5.7
2	6215	54.6	251118	54.4
3	4479	39.4	178919	38.8
4	95	0.8	4989	1.1
5	.	.	15	0.0
TOTAL	11381	100.0	461285	100.0

Note: The AOANJRR commenced collection of ASA data in 2013. 77 Attune PS 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 PS		Other Total Knee	
	N	Col%	N	Col%
Underweight (<18.50)	28	0.3	747	0.2
Normal (18.50-24.99)	1159	11.8	38609	10.5
Pre Obese (25.00-29.99)	3175	32.2	114835	31.2
Obese Class 1 (30.00-34.99)	2905	29.5	113650	30.9
Obese Class 2 (35.00-39.99)	1576	16.0	62350	16.9
Obese Class 3 (\geq 40.00)	1006	10.2	37913	10.3
TOTAL	9849	100.0	368104	100.0

Note: The AOANJRR commenced collection of BMI data in 2015. 1609 Attune PS procedures with no BMI recorded are excluded from this table

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

Primary Diagnosis	Attune PS		Other Total Knee	
	N	Col%	N	Col%
Osteoarthritis	11280	98.4	810642	97.8
Rheumatoid Arthritis	100	0.9	9818	1.2
Other Inflammatory Arthritis	36	0.3	4208	0.5
Osteonecrosis	23	0.2	2523	0.3
Tumour	1	0.0	1006	0.1
Fracture	16	0.1	683	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	3	0.0
Other	2	0.0	250	0.0
TOTAL	11458	100.0	829151	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 PS	220	11458	39103	0.56 (0.49, 0.64)
Other Total Knee	33839	829151	6116418	0.55 (0.55, 0.56)
TOTAL	34059	840609	6155521	0.55 (0.55, 0.56)

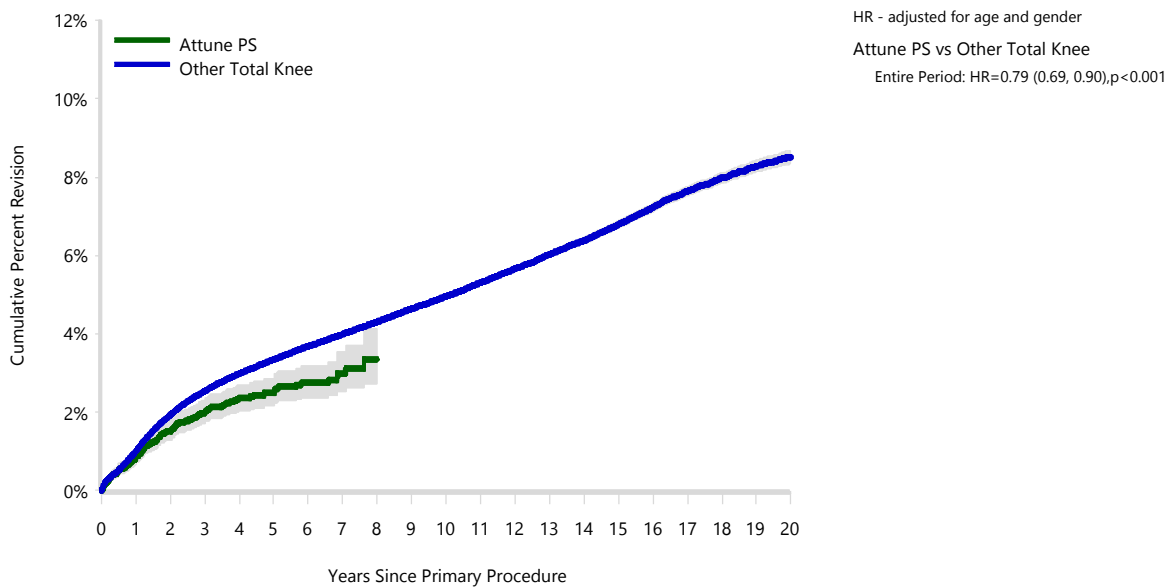
Table 11: Yearly Cumulative Percent Revision of Primary Total Knee Replacement by Model (All Diagnoses)

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs
Attune PS	0.8 (0.7, 1.0)	1.5 (1.3, 1.8)	2.0 (1.7, 2.3)	2.4 (2.0, 2.7)	2.5 (2.2, 2.9)	2.7 (2.4, 3.2)
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)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs
Attune PS	3.0 (2.5, 3.5)	3.4 (2.7, 4.1)					
Other Total Knee	4.0 (3.9, 4.0)	4.3 (4.3, 4.4)	4.6 (4.6, 4.7)	5.0 (4.9, 5.0)	5.3 (5.2, 5.4)	5.7 (5.6, 5.7)	6.0 (6.0, 6.1)

CPR	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs
Attune PS							
Other Total Knee	6.4 (6.3, 6.5)	6.8 (6.7, 6.9)	7.2 (7.1, 7.3)	7.6 (7.5, 7.8)	8.0 (7.9, 8.1)	8.3 (8.1, 8.4)	8.5 (8.3, 8.7)

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	8 Yrs	9 Yrs
Attune PS	11458	9677	7476	5857	4338	3013	1833	930	244	21
Other Total Knee	829151	773023	699379	638232	573339	509692	448399	390618	336713	286255

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 PS	0	0	0	0	0	0	0	0	0	0	0
Other Total Knee	240067	197550	160030	127571	99704	75584	55688	39355	26032	15737	7682

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 9.2 Years)

Revision Diagnosis	Number	Attune PS		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	90	0.8	40.9	7684	0.9	26.0
Loosening	53	0.5	24.1	6860	0.8	23.2
Instability	25	0.2	11.4	2674	0.3	9.0
Patellofemoral Pain	3	0.0	1.4	2574	0.3	8.7
Pain	10	0.1	4.5	2440	0.3	8.3
Patella Erosion	2	0.0	0.9	1729	0.2	5.9
Arthrofibrosis	14	0.1	6.4	1168	0.1	4.0
Fracture	12	0.1	5.5	909	0.1	3.1
Malalignment	4	0.0	1.8	676	0.1	2.3
Lysis				382	0.0	1.3
Metal Related Pathology				338	0.0	1.1
Incorrect Sizing				321	0.0	1.1
Wear Tibial Insert	1	0.0	0.5	309	0.0	1.0
Patella Maltracking	1	0.0	0.5	231	0.0	0.8
Bearing Dislocation	1	0.0	0.5	187	0.0	0.6
Implant Breakage Tibial Insert				149	0.0	0.5
Implant Breakage Patella				141	0.0	0.5
Synovitis	1	0.0	0.5	96	0.0	0.3
Prosthesis Dislocation				91	0.0	0.3
Osteonecrosis	1	0.0	0.5	63	0.0	0.2
Implant Breakage Tibial				52	0.0	0.2
Implant Breakage Femoral				42	0.0	0.1
Tumour	1	0.0	0.5	31	0.0	0.1
Wear Patella				28	0.0	0.1
Heterotopic Bone				14	0.0	0.0
Wear Tibial				9	0.0	0.0
Progression Of Disease				4	0.0	0.0
Wear Femoral				4	0.0	0.0
Incorrect Side				2	0.0	0.0
Patella Dislocation				2	0.0	0.0
Other	1	0.0	0.5	338	0.0	1.1
N Revision	220	1.9	100.0	29548	3.6	100.0
N Primary	11458			829151		

Note: This table is restricted to revisions within 9.2 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 PS	Infection	90	0.4 (0.3, 0.6)	0.7 (0.6, 0.9)	0.8 (0.6, 1.0)	0.9 (0.7, 1.1)		
	Loosening	53	0.1 (0.1, 0.2)	0.3 (0.2, 0.4)	0.5 (0.3, 0.6)	0.6 (0.5, 0.9)		
	Instability	25	0.1 (0.1, 0.2)	0.2 (0.2, 0.4)	0.3 (0.2, 0.4)	0.3 (0.2, 0.4)		
	Patellofemoral Pain	3	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)		
	Pain	10	0.0 (0.0, 0.1)	0.0 (0.0, 0.1)	0.1 (0.1, 0.2)	0.1 (0.1, 0.2)		
	Other	39	0.1 (0.1, 0.2)	0.2 (0.2, 0.3)	0.3 (0.2, 0.4)	0.5 (0.3, 0.6)		
	Deceased	393	0.5 (0.4, 0.7)	1.4 (1.2, 1.6)	2.4 (2.1, 2.8)	5.0 (4.5, 5.6)		
	All Revision	220	0.8 (0.7, 1.0)	1.5 (1.3, 1.8)	2.0 (1.7, 2.3)	2.5 (2.1, 2.8)		
Other Total Knee	Infection	8246	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)
	Loosening	8128	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, 1.6)
	Instability	2991	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	2749	0.1 (0.0, 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	2677	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	9048	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	15146 9	0.7 (0.7, 0.7)	1.7 (1.7, 1.7)	2.9 (2.9, 3.0)	6.3 (6.3, 6.4)	19.7 (19.6, 19.8)	37.6 (37.5, 37.8)
	All Revision	33839	1.0 (1.0, 1.0)	1.9 (1.9, 2.0)	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)

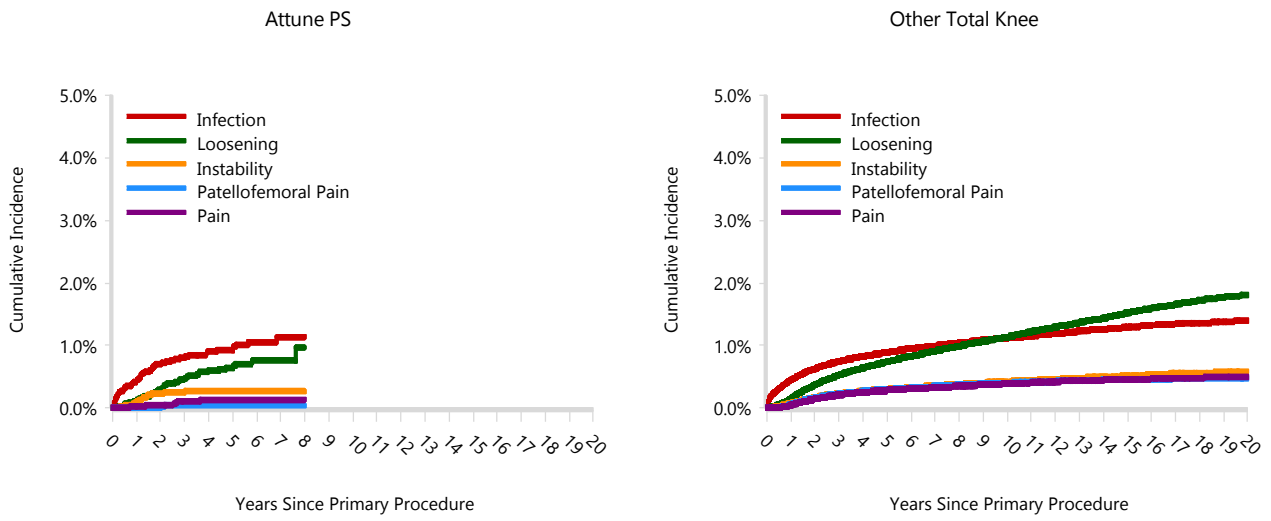


TABLE 14

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 9.2 Years)

Type of Revision	Number	Attune PS		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	98	0.9	44.5	7663	0.9	25.9
TKR (Tibial/Femoral)	60	0.5	27.3	7272	0.9	24.6
Patella Only	10	0.1	4.5	5778	0.7	19.6
Insert/Patella	3	0.0	1.4	2756	0.3	9.3
Tibial Component	26	0.2	11.8	2499	0.3	8.5
Femoral Component	10	0.1	4.5	1666	0.2	5.6
Cement Spacer	12	0.1	5.5	1611	0.2	5.5
Removal of Prostheses				182	0.0	0.6
Minor Components	1	0.0	0.5	72	0.0	0.2
Total Femoral				18	0.0	0.1
Cement Only				17	0.0	0.1
Reinsertion of Components				14	0.0	0.0
N Revision	220	1.9	100.0	29548	3.6	100.0
N Primary	11458			829151		

Note: This table is restricted to revisions within 9.2 years for all groups to allow a time-matched comparison of revisions.

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

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Cemented	212	10804	38561	0.55 (0.48, 0.63)
Hybrid (Tibial Cementless)	8	654	542	1.48 (0.64, 2.91)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

Table 16: Revision Rates of Attune PS 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	2	0.00 (0.00, 202.6)
XLPE + Antioxidant	220	11456	39100	0.56 (0.49, 0.64)
Unknown	0	1	1	0.00 (0.00, 292.3)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

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

Bearing Mobility	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Fixed	97	4678	20569	0.47 (0.38, 0.58)
Rotating	123	6779	18532	0.66 (0.55, 0.79)
Unknown	0	1	1	0.00 (0.00, 292.3)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

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

Stability	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Minimally Stabilised	0	6	20	0.00 (0.00, 18.26)
Posterior Stabilised	220	11451	39082	0.56 (0.49, 0.64)
Unknown	0	1	1	0.00 (0.00, 292.3)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

Table 19: Revision Rates of Attune PS 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	196	11029	37066	0.53 (0.46, 0.61)
No Patella	24	429	2037	1.18 (0.76, 1.75)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

Table 20: Revision Rates of Attune PS 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	76	5010	14265	0.53 (0.42, 0.67)
Non-Navigated	144	6448	24838	0.58 (0.49, 0.68)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

Table 21: Revision Rates of Attune PS 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	2	109	382	0.52 (0.06, 1.89)
IDI Not Used	218	11349	38721	0.56 (0.49, 0.64)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

Table 22: Revision Rates of Attune PS 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	8	5	0.00 (0.00, 80.87)
Non-Robotic	220	11450	39098	0.56 (0.49, 0.64)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

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

Year of Implant	Number Revised	Total Number
2013	2	154
2014	12	564
2015	30	931
2016	24	1048
2017	40	1353
2018	37	1365
2019	35	1777
2020	23	1694
2021	16	2124
2022	1	448
TOTAL	220	11458

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

Tibial	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune	220	11457	39101	0.56 (0.49, 0.64)
Other Tibial Components*	0	1	2	0.00 (0.00, 202.6)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

*denotes tibial components distributed by other companies

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

Femoral Catalogue Number	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
150410101	0	1	1	0.00 (0.00, 298.8)
150410102	0	11	31	0.00 (0.00, 11.79)
150410103	1	138	587	0.17 (0.00, 0.95)
150410104	10	465	1800	0.56 (0.27, 1.02)
150410105	6	760	2705	0.22 (0.08, 0.48)
150410106	17	882	3136	0.54 (0.32, 0.87)
150410107	16	934	3180	0.50 (0.29, 0.82)
150410108	12	601	1865	0.64 (0.33, 1.12)
150410109	3	184	589	0.51 (0.10, 1.49)
150410110	1	29	91	1.09 (0.03, 6.10)
150410123	1	23	85	1.18 (0.03, 6.59)
150410124	6	201	752	0.80 (0.29, 1.74)
150410125	5	520	1776	0.28 (0.09, 0.66)
150410126	10	550	1762	0.57 (0.27, 1.04)
150410201	0	2	8	0.00 (0.00, 46.93)
150410202	0	7	27	0.00 (0.00, 13.84)
150410203	3	153	617	0.49 (0.10, 1.42)
150410204	7	533	1942	0.36 (0.14, 0.74)
150410205	21	910	3201	0.66 (0.41, 1.00)
150410206	25	957	3385	0.74 (0.48, 1.09)
150410207	25	1125	3652	0.68 (0.44, 1.01)
150410208	20	705	2191	0.91 (0.56, 1.41)
150410209	6	217	617	0.97 (0.36, 2.12)
150410210	3	41	115	2.60 (0.54, 7.61)
150410223	0	30	112	0.00 (0.00, 3.29)
150410224	2	207	768	0.26 (0.03, 0.94)
150410225	12	643	2168	0.55 (0.29, 0.97)
150410226	8	629	1938	0.41 (0.18, 0.81)
TOTAL	220	11458	39103	0.56 (0.49, 0.64)

098058-220821 DSUS/EMEA