

**AOANJRR Automated Industry Report 335 - Depuy Synthes Australia**  
**Attune PS Total Knee**

Data Period: 1 September 1999 - 17 August 2018

**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	3594
Attune PS	150410123 - 150410226	PS Narrow Femoral Component	1093

**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	31	3594	7446	0.42 (0.28, 0.59)
150410123 - 150410226	16	1093	2238	0.71 (0.41, 1.16)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

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

	N
<b>Implant Usage</b>	
Date First Used	13 March 2013
Date Last Used	1 August 2018
N Procedures	4687
N Patients	4046
N Hospitals Implanting	90
N Surgeons Implanting*	126
<b>Outcome</b>	
N Revised	47
N Deceased**	58

\*320 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 Primary Total Knee Replacement (All Diagnoses)**

Model	N	Minimum	Maximum	Median	Mean	Std Dev
Attune PS	4687	0.04	5.43	1.86	2.07	1.28
<b>TOTAL</b>	<b>4687</b>	<b>0.04</b>	<b>5.43</b>	<b>1.86</b>	<b>2.07</b>	<b>1.28</b>

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

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	1964	41.9%	35	92	69	68.6	9.1
Female	2723	58.1%	33	97	69	68.9	9.4
<b>TOTAL</b>	<b>4687</b>	<b>100.0%</b>	<b>33</b>	<b>97</b>	<b>69</b>	<b>68.8</b>	<b>9.3</b>

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

Age	Attune PS		Other Total Knee	
	N	Col%	N	Col%
<55	327	7.0	42721	6.8
55-64	1133	24.2	165141	26.4
65-74	1890	40.3	245062	39.1
≥75	1337	28.5	173490	27.7
<b>TOTAL</b>	<b>4687</b>	<b>100.0</b>	<b>626414</b>	<b>100.0</b>

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

Gender	Attune PS		Other Total Knee	
	N	Col%	N	Col%
Male	1964	41.9	271858	43.4
Female	2723	58.1	354556	56.6
<b>TOTAL</b>	<b>4687</b>	<b>100.0</b>	<b>626414</b>	<b>100.0</b>

**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	237	5.1	15803	6.1
2	2524	54.7	144510	55.8
3	1798	39.0	95672	37.0
4	53	1.1	2852	1.1
5	1	0.0	15	0.0
<b>TOTAL</b>	<b>4613</b>	<b>100.0</b>	<b>258852</b>	<b>100.0</b>

Note: The AOANJRR commenced collection of ASA data in 2013. 74 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)	8	0.2	353	0.2
Normal (18.50-24.99)	388	12.1	17509	10.4
Pre Obese (25.00-29.99)	1045	32.5	52384	31.2
Obese Class 1 (30.00-34.99)	935	29.1	51421	30.6
Obese Class 2 (35.00-39.99)	499	15.5	28518	17.0
Obese Class 3 (≥40.00)	336	10.5	17808	10.6
<b>TOTAL</b>	<b>3211</b>	<b>100.0</b>	<b>167993</b>	<b>100.0</b>

Note: The AOANJRR commenced collection of BMI data in 2015. 1476 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	4605	98.3	611684	97.6
Rheumatoid Arthritis	51	1.1	8216	1.3
Other Inflammatory Arthritis	16	0.3	3129	0.5
Osteonecrosis	13	0.3	1993	0.3
Tumour	.	.	777	0.1
Fracture	1	0.0	416	0.1
Chondrocalcinosis	.	.	18	0.0
Osteochondritis Dissecans	.	.	2	0.0
Other	1	0.0	179	0.0
<b>TOTAL</b>	<b>4687</b>	<b>100.0</b>	<b>626414</b>	<b>100.0</b>

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

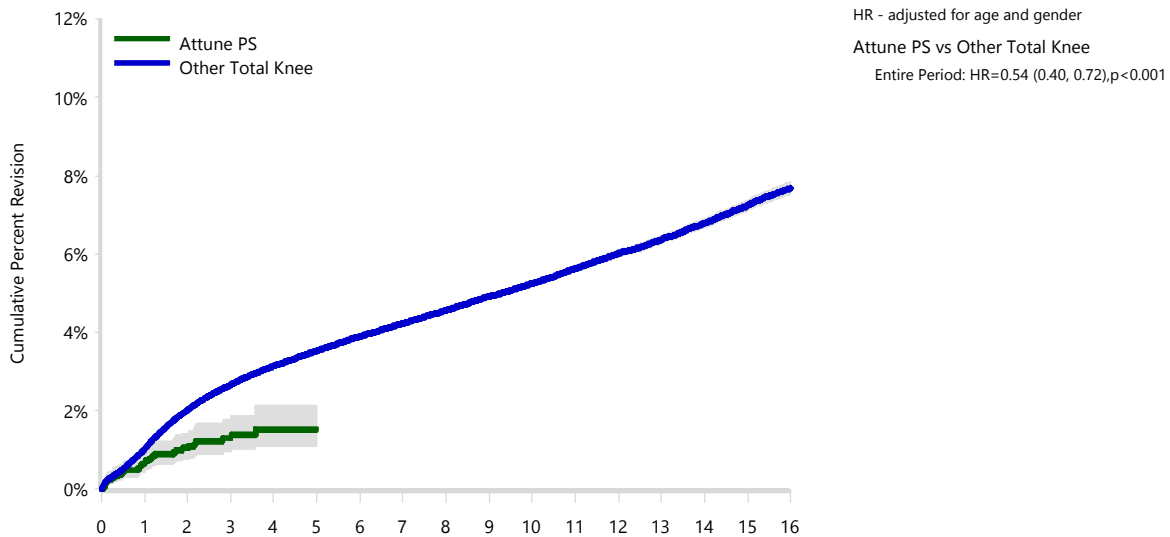
Model	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune PS	47	4687	9683	0.49 (0.36, 0.65)
Other Total Knee	24050	626414	3922199	0.61 (0.61, 0.62)
<b>TOTAL</b>	<b>24097</b>	<b>631101</b>	<b>3931882</b>	<b>0.61 (0.61, 0.62)</b>



**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 PS	0.7 (0.5, 0.9)	1.0 (0.8, 1.4)	1.3 (1.0, 1.8)	1.5 (1.1, 2.1)	1.5 (1.1, 2.1)	
Other Total Knee	1.0 (1.0, 1.0)	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 PS						
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 PS						
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 PS	4687	3501	2195	1238	347	62	0	0	
Other Total Knee	626414	568771	505643	446440	391119	339234	290891	245575	
Number at Risk	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Attune PS	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 5.4 Years)**

Revision Diagnosis	Number	Attune PS		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	21	0.4	44.7	4894	0.8	25.9
Loosening	9	0.2	19.1	4431	0.7	23.5
Patellofemoral Pain	1	0.0	2.1	2008	0.3	10.6
Pain	1	0.0	2.1	1641	0.3	8.7
Instability	7	0.1	14.9	1510	0.2	8.0
Patella Erosion				914	0.1	4.8
Arthrofibrosis	2	0.0	4.3	766	0.1	4.1
Fracture	2	0.0	4.3	518	0.1	2.7
Malalignment	1	0.0	2.1	448	0.1	2.4
Incorrect Sizing				259	0.0	1.4
Metal Related Pathology				257	0.0	1.4
Lysis				175	0.0	0.9
Patella Maltracking				154	0.0	0.8
Bearing Dislocation				148	0.0	0.8
Wear Tibial Insert				139	0.0	0.7
Implant Breakage Patella				86	0.0	0.5
Implant Breakage Tibial Insert				64	0.0	0.3
Synovitis				62	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	2	0.0	4.3	23	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	1	0.0	2.1	199	0.0	1.1
<b>N Revision</b>	<b>47</b>	<b>1.0</b>	<b>100.0</b>	<b>18871</b>	<b>3.0</b>	<b>100.0</b>
<b>N Primary</b>	<b>4687</b>			<b>626414</b>		

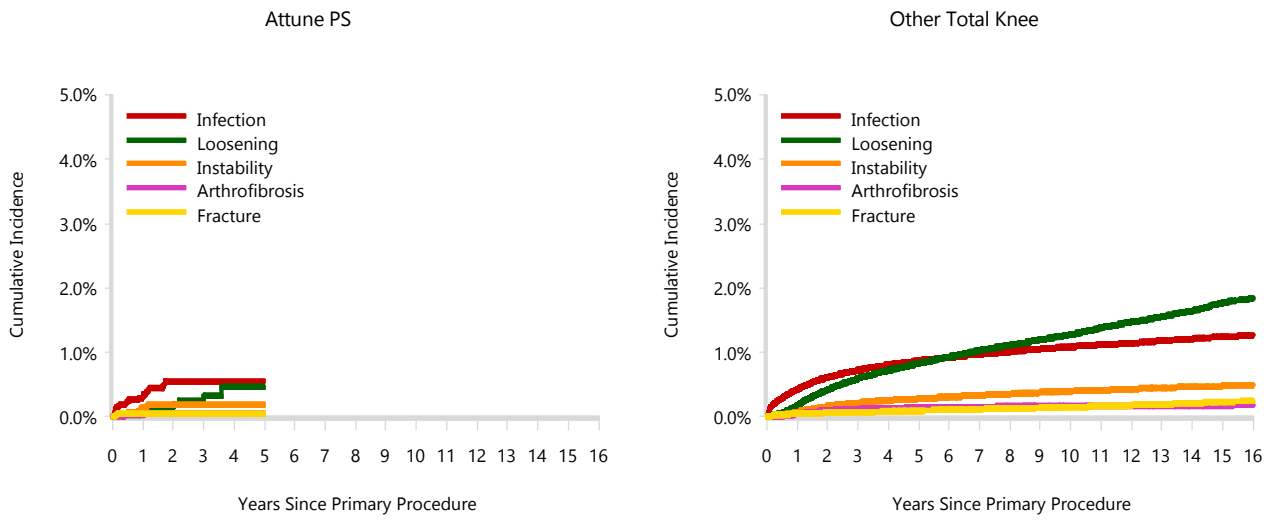
Note: This table is restricted to revisions within 5.4 years for all groups to allow a time-matched comparison of revisions.

**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 PS	Infection	21	0.3 (0.2, 0.5)	0.6 (0.3, 0.8)	0.6 (0.3, 0.8)	0.6 (0.3, 0.8)		
	Loosening	9	0.1 (0.0, 0.2)	0.1 (0.1, 0.3)	0.2 (0.1, 0.5)	0.5 (0.2, 0.9)		
	Instability	7	0.2 (0.1, 0.3)	0.2 (0.1, 0.4)	0.2 (0.1, 0.4)	0.2 (0.1, 0.4)		
	Arthrofibrosis	2	0.0 (0.0, 0.1)	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)		
	Fracture	2	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)	0.0 (0.0, 0.2)		
	Other	6	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)	0.2 (0.1, 0.5)	0.2 (0.1, 0.5)		
	Deceased	58	0.4 (0.2, 0.6)	1.4 (1.0, 1.9)	1.8 (1.3, 2.3)	2.8 (1.8, 4.3)		
	All Revision	47	0.7 (0.4, 0.9)	1.0 (0.8, 1.4)	1.3 (0.9, 1.7)	1.5 (1.1, 2.1)		
	Other Total Knee	Infection	5598	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		6058	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		1888	0.1 (0.1, 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)	0.5 (0.5, 0.5)
Arthrofibrosis		836	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)
Fracture		737	0.0 (0.0, 0.0)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.1)	0.1 (0.1, 0.2)	0.2 (0.2, 0.2)
Other		8933	0.3 (0.3, 0.3)	0.7 (0.6, 0.7)	0.9 (0.9, 1.0)	1.3 (1.2, 1.3)	1.9 (1.8, 1.9)	2.5 (2.4, 2.5)
Deceased		85460	0.7 (0.7, 0.8)	1.8 (1.7, 1.8)	3.0 (3.0, 3.1)	6.5 (6.4, 6.6)	20.0 (19.8, 20.1)	36.5 (36.2, 36.8)
All Revision		24050	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)	6.3 (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 5.4 Years)**

Type of Revision	Number	Attune PS		Other Total Knee		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Insert Only	25	0.5	53.2	4661	0.7	24.7
TKR (Tibial/Femoral)	12	0.3	25.5	4231	0.7	22.4
Patella Only	1	0.0	2.1	4001	0.6	21.2
Tibial Component	2	0.0	4.3	1849	0.3	9.8
Insert/Patella				1561	0.2	8.3
Femoral Component	3	0.1	6.4	1238	0.2	6.6
Cement Spacer	3	0.1	6.4	1130	0.2	6.0
Removal of Prostheses				123	0.0	0.7
Minor Components	1	0.0	2.1	47	0.0	0.2
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>47</b>	<b>1.0</b>	<b>100.0</b>	<b>18871</b>	<b>3.0</b>	<b>100.0</b>
<b>N Primary</b>	<b>4687</b>			<b>626414</b>		

Note: This table is restricted to revisions within 5.4 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	47	4687	9683	0.49 (0.36, 0.65)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

**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 + Antioxidant	47	4687	9683	0.49 (0.36, 0.65)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

**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	32	2910	6431	0.50 (0.34, 0.70)
Rotating	15	1777	3252	0.46 (0.26, 0.76)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

**Table 18: 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	42	4383	8930	0.47 (0.34, 0.64)
No Patella	5	304	753	0.66 (0.22, 1.55)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

**Table 19: Number of Revisions of Attune PS Primary Total Knee Replacement by Year of Implant (All Diagnoses)**

Year of Implant	Number Revised	Total Number
2013	1	154
2014	7	564
2015	16	930
2016	9	1047
2017	12	1346
2018	2	646
<b>TOTAL</b>	<b>47</b>	<b>4687</b>

**Table 20: 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	47	4687	9683	0.49 (0.36, 0.65)
<b>TOTAL</b>	<b>47</b>	<b>4687</b>	<b>9683</b>	<b>0.49 (0.36, 0.65)</b>

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