Attune PS (cemented)/Attune (cementless) Total Knee Investigation

Note: This analysis compares the Attune PS (ctd)/Attune (cless) femoral/tibial combination with all other total knee prostheses.

This combination has been identified as having a significantly higher rate of revision. For a detailed explanation of the process used by the Registry that results in identification of prostheses that have a higher than anticipated rate of revision please refer to the Prostheses with Higher than Anticipated Rates of Revision chapter of the most recent AOANJRR Annual Report, https://aoanjrr.sahmri.com/annual-reports-2025.

Note: Procedures using prostheses with no recorded use in 2024 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Knee Replacement

The revision rate of the Attune PS (ctd)/Attune (cless) total knee combination is compared to all other total knee prostheses.

Table 1: Revision Rates of Primary Total Knee Replacement

Component	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Attune PS (ctd)/Attune (cless)	38	1210	2950	1.29 (0.91, 1.77)
Other Total Knee	24669	719851	4532588	0.54 (0.54, 0.55)
TOTAL	**24707**	**721061**	**4535539**	**0.54 (0.54, 0.55)**

Note: Prostheses no longer used in 2024 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Attune PS (ctd)/Attune (cless) total knee combination is compared to all other total knee prostheses.

Table 2: Yearly Cumulative Percent Revision (95% CI) of Primary Total Knee Replacement

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
Attune PS (ctd)/Attune (cless)	1.7 (1.1, 2.6)	2.9 (2.0, 4.1)	3.9 (2.8, 5.3)					
Other Total Knee	1.0 (1.0, 1.0)	1.8 (1.8, 1.9)	2.4 (2.4, 2.4)	2.8 (2.8, 2.8)	3.1 (3.1, 3.2)	3.5 (3.4, 3.5)	3.8 (3.7, 3.8)	4.1 (4.0, 4.2)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Attune PS (ctd)/Attune (cless)								
Other Total Knee	4.4 (4.3, 4.5)	4.7 (4.7, 4.8)	5.1 (5.0, 5.1)	5.4 (5.3, 5.5)	5.7 (5.6, 5.8)	6.0 (5.9, 6.1)	6.4 (6.3, 6.5)	6.8 (6.7, 7.0)

CPR	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
Attune PS (ctd)/Attune (cless)							
Other Total Knee	7.3 (7.1, 7.4)	7.6 (7.4, 7.8)	7.9 (7.7, 8.1)	8.1 (7.9, 8.3)	8.4 (8.1, 8.6)	8.5 (8.2, 8.8)	8.6 (8.3, 8.9)

Note: Prostheses no longer used in 2024 are excluded from the comparator.

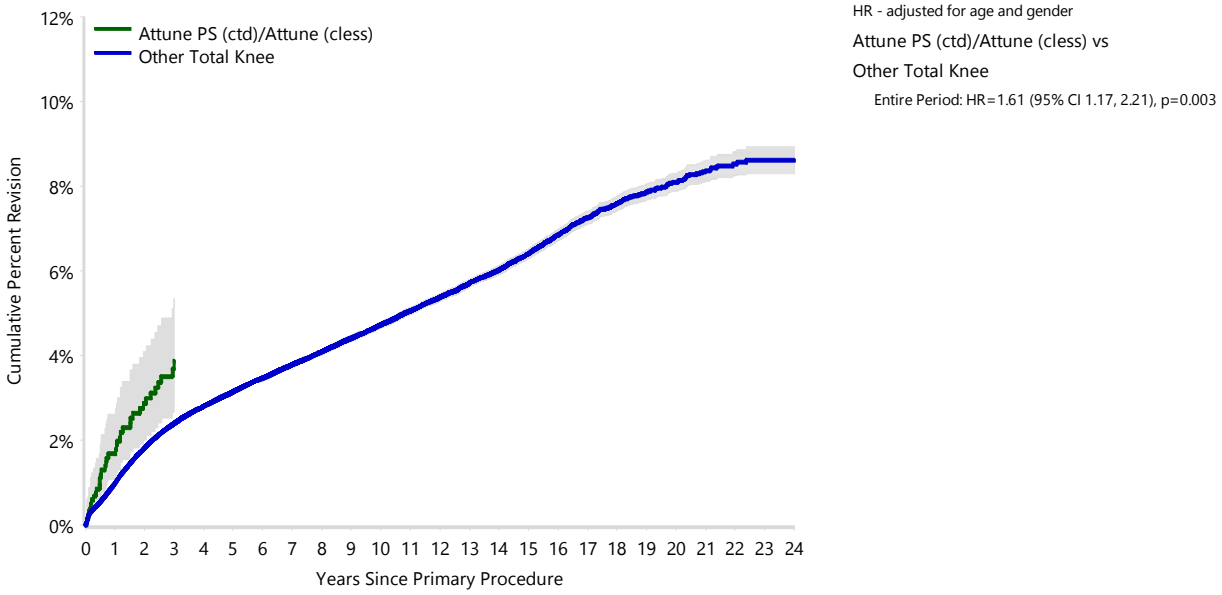
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Attune PS (ctd)/Attune (cless) total knee combination is compared to all other total knee prostheses. In addition, hazard ratios are reported.

Hazard ratios are reported for specific time periods during which the hazard ratio is constant. This is done to enable more specific and valid comparisons of the risk of revision over time. The pattern of variation in risk has important implications with respect to the underlying reasons for any difference.

Figure 1: Cumulative Percent Revision of Primary Total Knee Replacement



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	11 Yrs
Attune PS (ctd)/Attune (cless)	1210	970	821	539	38	0	0	0	0	0	0	0
Other Total Knee	719851	639758	561214	497653	435287	380214	326275	276480	231477	191174	154582	123868

Number at Risk	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
Attune PS (ctd)/Attune (cless)	0	0	0	0	0	0	0	0	0	0	0	0
Other Total Knee	97988	75221	56549	41508	30003	21223	14967	10421	6807	4051	2359	1090

Note: Prostheses no longer used in 2024 are excluded from the comparator.

TABLE 3

Primary Diagnosis for Revised Primary Total Knee Replacement

This table identifies the diagnosis of the primary procedure which was subsequently revised. This information is provided as there is a variation on outcome depending on the primary diagnosis. It is therefore important when considering the reasons for a higher than anticipated rate of revision that there is identification of the primary diagnosis. This information should be compared to the primary diagnosis for the revisions of all other total knee prostheses.

Table 3: Primary Diagnosis for Revised Primary Total Knee Replacement

	Attune PS (ctd)/Attune (cless)		Other Total Knee	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	38	100.0	23852	96.7
Rheumatoid Arthritis			301	1.2
Tumour			192	0.8
Other Inflammatory Arthritis			158	0.6
Osteonecrosis			90	0.4
Fracture			50	0.2
Other			25	0.1
Chondrocalcinosis			1	0.0
TOTAL	**38**	**100.0**	**24669**	**100.0**

Note: Prostheses no longer used in 2024 are excluded from the comparator.

TABLE 4

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 4: Primary Total Knee Replacement - Reason for Revision (Follow-up Limited to 4.3 Years)

	Attune PS (ctd)/Attune (cless)			Other Total Knee		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	10	0.8	26.3	5771	0.8	33.1
Loosening	21	1.7	55.3	3298	0.5	18.9
Instability	2	0.2	5.3	1842	0.3	10.6
Pain	1	0.1	2.6	1256	0.2	7.2
Patellofemoral Pain				1051	0.1	6.0
Patella Erosion				1004	0.1	5.8
Arthrofibrosis	1	0.1	2.6	911	0.1	5.2
Fracture	3	0.2	7.9	593	0.1	3.4
Malalignment				383	0.1	2.2
Incorrect Sizing				192	0.0	1.1
Patella Maltracking				153	0.0	0.9
Bearing Dislocation				119	0.0	0.7
Lysis				114	0.0	0.7
Wear Tibial Insert				74	0.0	0.4
Implant Breakage Patella				71	0.0	0.4
Metal Related Pathology				67	0.0	0.4
Prosthesis Dislocation				57	0.0	0.3
Implant Breakage Tibial Insert				46	0.0	0.3
Synovitis				42	0.0	0.2
Osteonecrosis				35	0.0	0.2
Implant Breakage Femoral				23	0.0	0.1
Implant Breakage Tibial				20	0.0	0.1
Tumour				19	0.0	0.1
Wear Patella				11	0.0	0.1
Heterotopic Bone				8	0.0	0.0
Progression Of Disease				3	0.0	0.0
Wear Tibial				2	0.0	0.0
Incorrect Side				1	0.0	0.0
Patella Dislocation				1	0.0	0.0
Other				256	0.0	1.5
N Revision	**38**	**3.1**	**100.0**	**17423**	**2.4**	**100.0**
N Primary	**1210**			**719851**		

Note: This table is restricted to revisions within 4.3 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2024 are excluded from the comparator.

FIGURE 2

Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement

This figure details the cumulative incidence of the most common reasons for revision. The five most common reasons for revision are included as long as each of these reasons account for more than 10 procedures or at least 5% of all revisions for the Attune PS (ctd)/Attune (cless) total knee combination. A comparative graph is provided of the cumulative incidence for the same reasons for revisions for all other total knee prostheses.

Figure 2: Cumulative Incidence Revision Diagnosis for Primary Total Knee Replacement

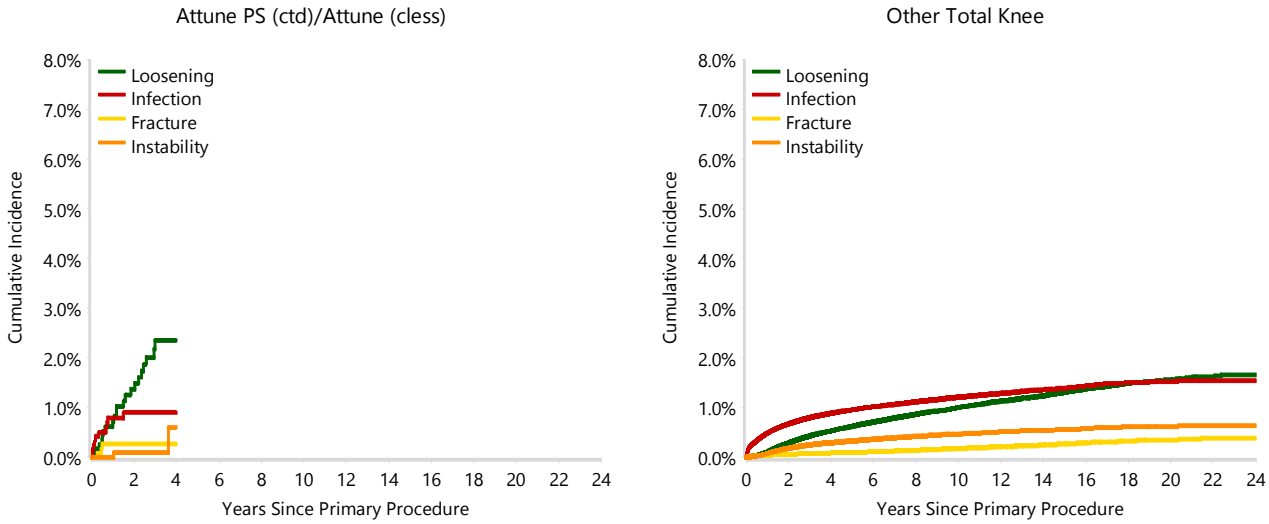


TABLE 5

Type of Revision Performed for Primary Total Knee Replacement

This analysis identifies the components used in the revision of the Attune PS (ctd)/Attune (cless) total knee combination and compares it to the components used in the revision of all other total knee prostheses.

The reason this analysis is undertaken is to identify whether there is one or more components which are being replaced that differ from the components replaced for revisions of all other total knee prostheses i.e. is there a difference in the type of revision undertaken for the Attune PS (ctd)/Attune (cless) total knee combination compared to all other total knee prostheses.

Table 5: Primary Total Knee Replacement - Type of Revision (Follow-up Limited to 4.3 Years)

	Attune PS (ctd)/Attune (cless)		Other Total Knee	
Type of Revision	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	5	13.2	3544	20.3
Tibial Component	20	52.6	1370	7.9
Femoral Component	1	2.6	981	5.6
Cement Spacer			850	4.9
Removal of Prostheses			99	0.6
Total Femoral			13	0.1
Reinsertion of Components			5	0.0
N Major	**26**	**68.4**	**6862**	**39.4**
Insert Only	11	28.9	6180	35.5
Patella Only	1	2.6	2996	17.2
Insert/Patella			1334	7.7
Minor Components			45	0.3
Cement Only			6	0.0
N Minor	**12**	**31.6**	**10561**	**60.6**
TOTAL	**38**	**100.0**	**17423**	**100.0**

Note: This table is restricted to revisions within 4.3 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2024 are excluded from the comparator.

TABLE 6

Revision Rates of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Fixation

This analysis is provided as some prostheses have more than one fixation option. Additionally there are prostheses where an alternative to the recommended approach to fixation was used e.g. a cementless prosthesis that has been cemented or vice-versa.

Table 6: Revised Number of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Fixation

Fixation	N Revised	N Total
Cemented	1	2
Hybrid (Tibial Cemented)	0	1
Hybrid (Tibial Cementless)	37	1207
TOTAL	**38**	**1210**

TABLE 7

Revision Rates of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Bearing Surface

This analysis is provided as some prostheses are combined with a variety of bearing surfaces. All bearing surfaces used with this combination are listed.

Table 7: Revised Number of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
XLPE + Antioxidant	38	1210
TOTAL	**38**	**1210**

TABLE 8

Revision Rates of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Bearing Mobility

This analysis is provided as some prostheses are combined with a variety of bearing mobilities. All bearing mobilities used with this combination are listed.

Table 8: Revised Number of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Bearing Mobility

Bearing Mobility	N Revised	N Total
Rotating	38	1210
TOTAL	**38**	**1210**

TABLE 9

Revision Rates of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Stability

This analysis is provided as some prostheses are combined with a variety of stabilities. All stabilities used with this combination are listed.

Table 9: Revised Number of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Stability

Stability	N Revised	N Total
Minimally Stabilised	0	1
Posterior Stabilised	38	1209
TOTAL	**38**	**1210**

TABLE 10

Number of Revisions of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the Attune PS (ctd)/Attune (cless) total knee combination. It also provides the subsequent number of revisions of the primaries reported in that year.

Primary procedures performed in later years have had less follow up time therefore the number revised is expected to be less than the number revised in earlier years. For example, a primary procedure performed in 2024 has a maximum of one year to be revised, whereas a primary procedure performed in 2022 has a maximum of three years to be revised.

Table 10: Number of Revisions of Attune PS (ctd)/Attune (cless) Primary Total Knee Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2019	1	1
2020	0	38
2021	24	530
2022	11	287
2023	0	136
2024	2	218
TOTAL	**38**	**1210**