ACS (cementless)/ACS Fixed Total Knee Investigation

Note: This analysis compares the ACS (class)/ACS Fixed 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-2026.

Note: Procedures using prostheses with no recorded use in 2025 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Knee Replacement

The revision rate of the ACS (class)/ACS Fixed 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)
ACS (class)/ACS Fixed	154	3058	22301	0.69 (0.59, 0.81)
Other Total Knee	27130	788372	5123621	0.53 (0.52, 0.54)
TOTAL	**27284**	**791430**	**5145922**	**0.53 (0.52, 0.54)**

Note: Prostheses no longer used in 2025 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the ACS (class)/ACS Fixed 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
ACS (class)/ACS Fixed	1.3 (1.0, 1.8)	3.0 (2.4, 3.6)	3.7 (3.0, 4.4)	3.9 (3.2, 4.7)	4.3 (3.7, 5.2)	4.6 (3.9, 5.4)
Other Total Knee	1.0 (1.0, 1.0)	1.8 (1.8, 1.8)	2.4 (2.3, 2.4)	2.8 (2.7, 2.8)	3.1 (3.0, 3.1)	3.4 (3.4, 3.5)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
ACS (class)/ACS Fixed	5.0 (4.2, 5.9)	5.3 (4.5, 6.2)	5.6 (4.7, 6.5)	5.7 (4.9, 6.8)	6.3 (5.3, 7.4)	6.5 (5.4, 7.7)
Other Total Knee	3.7 (3.7, 3.8)	4.0 (3.9, 4.1)	4.3 (4.3, 4.4)	4.6 (4.6, 4.7)	4.9 (4.9, 5.0)	5.3 (5.2, 5.3)

CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
ACS (class)/ACS Fixed	7.3 (5.5, 9.7)					
Other Total Knee	5.6 (5.5, 5.7)	5.9 (5.8, 6.0)	6.3 (6.2, 6.4)	6.7 (6.6, 6.9)	7.2 (7.0, 7.3)	7.5 (7.4, 7.7)

CPR	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
ACS (class)/ACS Fixed							
Other Total Knee	7.8 (7.7, 8.0)	8.1 (7.9, 8.3)	8.5 (8.2, 8.7)	8.7 (8.4, 9.0)	8.8 (8.5, 9.1)	9.1 (8.7, 9.5)	9.5 (8.8, 10.2)

Note: Prostheses no longer used in 2025 are excluded from the comparator.

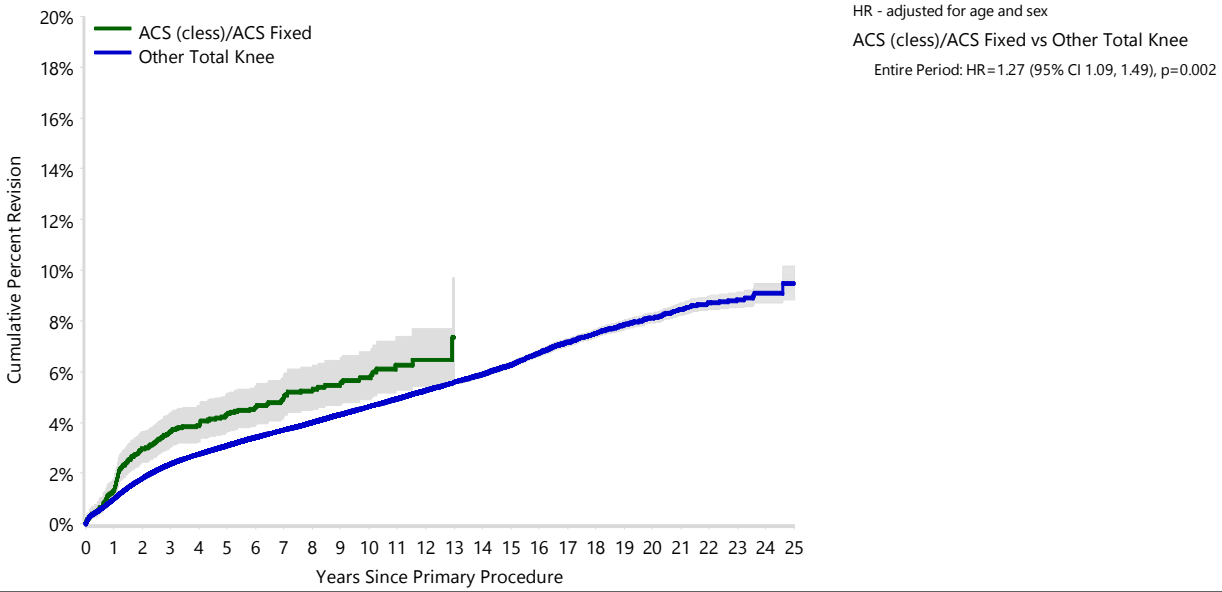
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the ACS (class)/ACS Fixed 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
ACS (class)/ACS Fixed	3058	2977	2767	2554	2389	2193	1961	1624
Other Total Knee	788372	705722	625507	548281	485155	422675	367884	314375

Number at Risk	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
ACS (class)/ACS Fixed	1349	1073	866	577	306	100	27	0	0
Other Total Knee	265467	221247	181788	146403	116895	92087	70353	52526	38351

Number at Risk	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
ACS (class)/ACS Fixed	0	0	0	0	0	0	0	0	0
Other Total Knee	27628	19434	13616	9427	6164	3657	2096	972	244

Note: Prostheses no longer used in 2025 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

	ACS (cless)/ACS Fixed		Other Total Knee	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	154	100.0	26238	96.7
Rheumatoid Arthritis			330	1.2
Tumour			199	0.7
Other Inflammatory Arthritis			177	0.7
Osteonecrosis			104	0.4
Fracture			55	0.2
Other			26	0.1
Chondrocalcinosis			1	0.0
TOTAL	**154**	**100.0**	**27130**	**100.0**

Note: Prostheses no longer used in 2025 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 14.7 Years)

	ACS (cless)/ACS Fixed			Other Total Knee		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	32	1.0	20.8	7765	1.0	29.4
Loosening	43	1.4	27.9	5555	0.7	21.0
Instability	14	0.5	9.1	2804	0.4	10.6
Patella Erosion	4	0.1	2.6	1935	0.2	7.3
Pain	15	0.5	9.7	1822	0.2	6.9
Patellofemoral Pain	20	0.7	13.0	1511	0.2	5.7
Arthrofibrosis	2	0.1	1.3	1178	0.1	4.5
Fracture	3	0.1	1.9	1075	0.1	4.1
Malalignment	7	0.2	4.5	504	0.1	1.9
Wear Tibial Insert	1	0.0	0.6	317	0.0	1.2
Lysis	3	0.1	1.9	264	0.0	1.0
Incorrect Sizing	3	0.1	1.9	214	0.0	0.8
Implant Breakage Tibial Insert				213	0.0	0.8
Patella Maltracking	1	0.0	0.6	190	0.0	0.7
Bearing Dislocation				148	0.0	0.6
Implant Breakage Patella	1	0.0	0.6	144	0.0	0.5
Metal Related Pathology				112	0.0	0.4
Prosthesis Dislocation	1	0.0	0.6	77	0.0	0.3
Synovitis				64	0.0	0.2
Osteonecrosis				51	0.0	0.2
Wear Patella				48	0.0	0.2
Implant Breakage Femoral				42	0.0	0.2
Implant Breakage Tibial				38	0.0	0.1
Tumour				36	0.0	0.1
Heterotopic Bone				15	0.0	0.1
Progression Of Disease				8	0.0	0.0
Wear Tibial				5	0.0	0.0
Patella Dislocation				3	0.0	0.0
Incorrect Side				1	0.0	0.0
Wear Femoral				1	0.0	0.0
Other	4	0.1	2.6	308	0.0	1.2
N Revision	**154**	**5.0**	**100.0**	**26448**	**3.4**	**100.0**
N Primary	**3058**			**788372**		

Note: This table is restricted to revisions within 14.7 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2025 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 ACS (class)/ACS Fixed 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

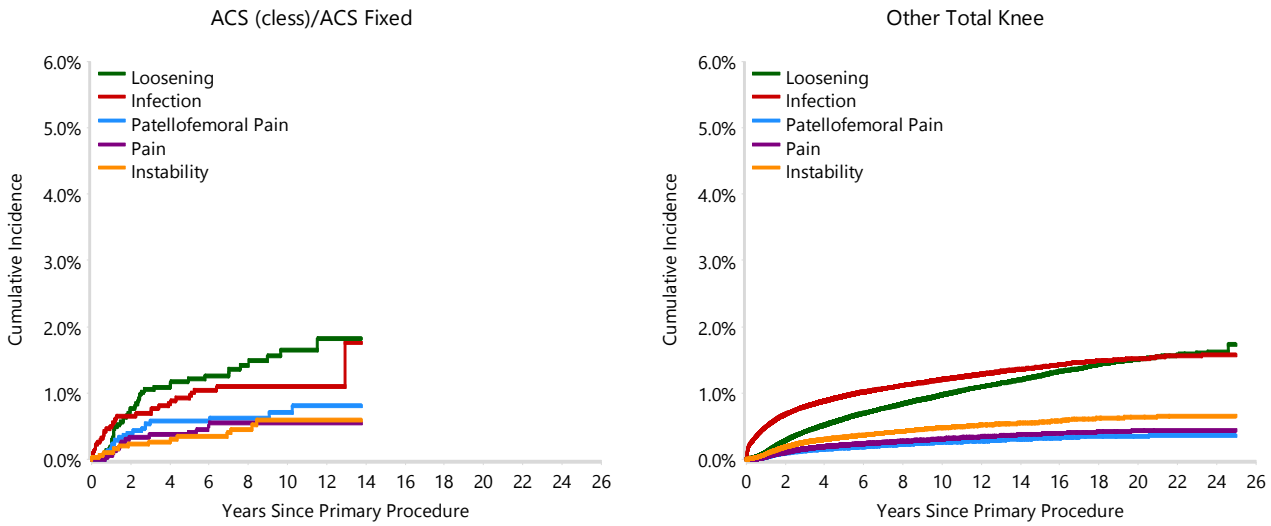


TABLE 5

Type of Revision Performed for Primary Total Knee Replacement

This analysis identifies the components used in the revision of the ACS (cless)/ACS Fixed 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 ACS (cless)/ACS Fixed total knee combination compared to all other total knee prostheses.

Table 5: Primary Total Knee Replacement - Type of Revision (Follow-up Limited to 14.7 Years)

	ACS (cless)/ACS Fixed		Other Total Knee	
Type of Revision	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	42	27.3	6376	24.1
Tibial Component	20	13.0	1878	7.1
Femoral Component	10	6.5	1293	4.9
Cement Spacer	4	2.6	1119	4.2
Removal of Prostheses			132	0.5
Total Femoral			21	0.1
Reinsertion of Components			8	0.0
N Major	**76**	**49.4**	**10827**	**40.9**
Insert Only	27	17.5	8417	31.8
Patella Only	34	22.1	4399	16.6
Insert/Patella	17	11.0	2730	10.3
Minor Components			65	0.2
Cement Only			10	0.0
N Minor	**78**	**50.6**	**15621**	**59.1**
TOTAL	**154**	**100.0**	**26448**	**100.0**

Note: This table is restricted to revisions within 14.7 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2025 are excluded from the comparator.

TABLE 6

Revision Rates of ACS (class)/ACS Fixed 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 ACS (class)/ACS Fixed Primary Total Knee Replacement by Fixation

Fixation	N Revised	N Total
Cemented	0	6
Cementless	72	1417
Hybrid (Tibial Cemented)	82	1634
Hybrid (Tibial Cementless)	0	1
TOTAL	**154**	**3058**

TABLE 7

Revision Rates of ACS (class)/ACS Fixed 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 ACS (class)/ACS Fixed Primary Total Knee Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Non XLPE	154	3058
TOTAL	**154**	**3058**

TABLE 8

Revision Rates of ACS (cless)/ACS Fixed 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 ACS (cless)/ACS Fixed Primary Total Knee Replacement by Bearing Mobility

Bearing Mobility	N Revised	N Total
Fixed	154	3058
TOTAL	**154**	**3058**

TABLE 9

Revision Rates of ACS (cless)/ACS Fixed 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 ACS (cless)/ACS Fixed Primary Total Knee Replacement by Stability

Stability	N Revised	N Total
Minimally Stabilised	141	2947
Posterior Stabilised	13	111
TOTAL	**154**	**3058**

TABLE 10

Revision Rates of Primary Total Knee Replacement by State

This enables a state by state variation to be identified for the ACS (cless)/ACS Fixed total knee combination and provides the comparative data for each of the states for all other total knee prostheses.

The purpose of this analysis is to determine if the higher than anticipated rate of revision has widespread distribution between states. If there is widespread distribution then the reason for the higher than anticipated rate of revision is unlikely to be surgeon specific. If the prosthesis has been used in only a small number of states it is not possible to distinguish if the higher than anticipated rate of revision is related to the prosthesis, surgeon, technique or patient.

Table 10: Revised Number of Primary Total Knee Replacement by State

Component	State	N Revised	N Total
ACS (cless)/ACS Fixed	NSW	0	1
	VIC	32	1011
	QLD	12	135
	WA	58	566
	SA	52	1345
Other Total Knee	NSW	7550	259496
	VIC	5988	162554
	QLD	5777	167109
	WA	3542	92275
	SA	3168	71769
	TAS	475	15075
	ACT/NT	630	20094
TOTAL		**27284**	**791430**

Note: Prostheses no longer used in 2025 are excluded from the comparator.

TABLE 11

Number of Revisions of ACS (cless)/ACS Fixed Primary Total Knee Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the ACS (cless)/ACS Fixed 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 2025 has a maximum of one year to be revised, whereas a primary procedure performed in 2023 has a maximum of three years to be revised.

Table 11: Number of Revisions of ACS (cless)/ACS Fixed Primary Total Knee Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2011	2	41
2012	10	118
2013	34	284
2014	30	337
2015	20	331
2016	15	238
2017	12	266
2018	7	259
2019	3	319
2020	6	209
2021	4	169
2022	3	127
2023	4	180
2024	4	144
2025	0	36
TOTAL	**154**	**3058**

TABLE 12

Revision Rates of ACS (class)/ACS Fixed Primary Total Knee Replacement by Catalogue Number Range

Many prostheses have a number of catalogue ranges. The catalogue range is specific to particular design features; more than one catalogue range usually indicates a minor difference in design in a particular ACS (class)/ACS Fixed prosthesis.

This analysis has been undertaken to determine if the revision rate varies according to the catalogue number range.

Model	Catalogue Range	Catalogue Description	Cement	Coating
Femoral				
ACS	42003102-42003118	FEMORAL COMPONENT POROUS COATED	NO	TIN
ACS	42003202-42005116	FEMORAL COMPONENT CEMENTLESS CPTI/TCP	NO	TIN
ACS	42006602-42006618	PS FEMORAL COMPONENT POROUS COATED	NO	TIN
ACS	42210303-42210316	FEMORAL COMPONENT SLIM POROUS COATED	NO	
Tibial				
ACS Fixed	42010402-42010419	FB TIBIAL COMPONENT POROUS COATED	NO	TIN
ACS Fixed	42010422-42010439	FB TIBIAL COMPONENT CEMENTED	YES	TIN

Table 12: Revised Number of ACS (class)/ACS Fixed Primary Total Knee Replacement by Catalogue Number Range

Femoral Range	Tibial Range	N Revised	N Total
42003102-42003118	42010402-42010419	35	644
	42010422-42010439	39	692
42003202-42005116	42010402-42010419	1	79
	42010422-42010439	0	178
42006602-42006618	42010402-42010419	9	61
	42010422-42010439	4	50
42210303-42210316	42010402-42010419	27	636
	42010422-42010439	39	718
TOTAL		**154**	**3058**