

ACS (cementless)/ACS Fixed Total Knee Investigation

Note: This analysis compares the ACS (cless)/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-2024>.

Note: Procedures using prostheses with no recorded use in 2023 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Knee Replacement

The revision rate of the ACS (cless)/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 (cless)/ACS Fixed	132	2873	17103	0.77 (0.65, 0.92)
Other Total Knee	24799	733210	4670960	0.53 (0.52, 0.54)
TOTAL	24931	736083	4688062	0.53 (0.53, 0.54)

Note: Prostheses no longer used in 2023 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

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

Table 2: Yearly Cumulative Percent Revision of Primary Total Knee Replacement

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
ACS (cless)/ACS Fixed	1.3 (1.0, 1.8)	3.0 (2.4, 3.7)	3.7 (3.0, 4.5)	4.0 (3.3, 4.8)	4.5 (3.7, 5.4)	4.8 (4.0, 5.7)	5.3 (4.4, 6.3)	5.6 (4.7, 6.6)
Other Total Knee	1.0 (0.9, 1.0)	1.8 (1.8, 1.8)	2.4 (2.3, 2.4)	2.8 (2.7, 2.8)	3.1 (3.1, 3.1)	3.4 (3.4, 3.5)	3.7 (3.7, 3.8)	4.0 (4.0, 4.1)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
ACS (cless)/ACS Fixed	5.7 (4.8, 6.8)	5.8 (4.9, 7.0)	5.8 (4.9, 7.0)					
Other Total Knee	4.3 (4.3, 4.4)	4.6 (4.6, 4.7)	4.9 (4.8, 5.0)	5.2 (5.1, 5.3)	5.5 (5.5, 5.6)	5.8 (5.7, 5.9)	6.2 (6.1, 6.3)	6.6 (6.5, 6.7)

CPR	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
ACS (cless)/ACS Fixed							
Other Total Knee	7.0 (6.8, 7.1)	7.3 (7.1, 7.4)	7.5 (7.3, 7.7)	7.7 (7.5, 7.9)	8.0 (7.7, 8.3)	8.2 (7.9, 8.6)	8.2 (7.9, 8.6)

Note: Prostheses no longer used in 2023 are excluded from the comparator.

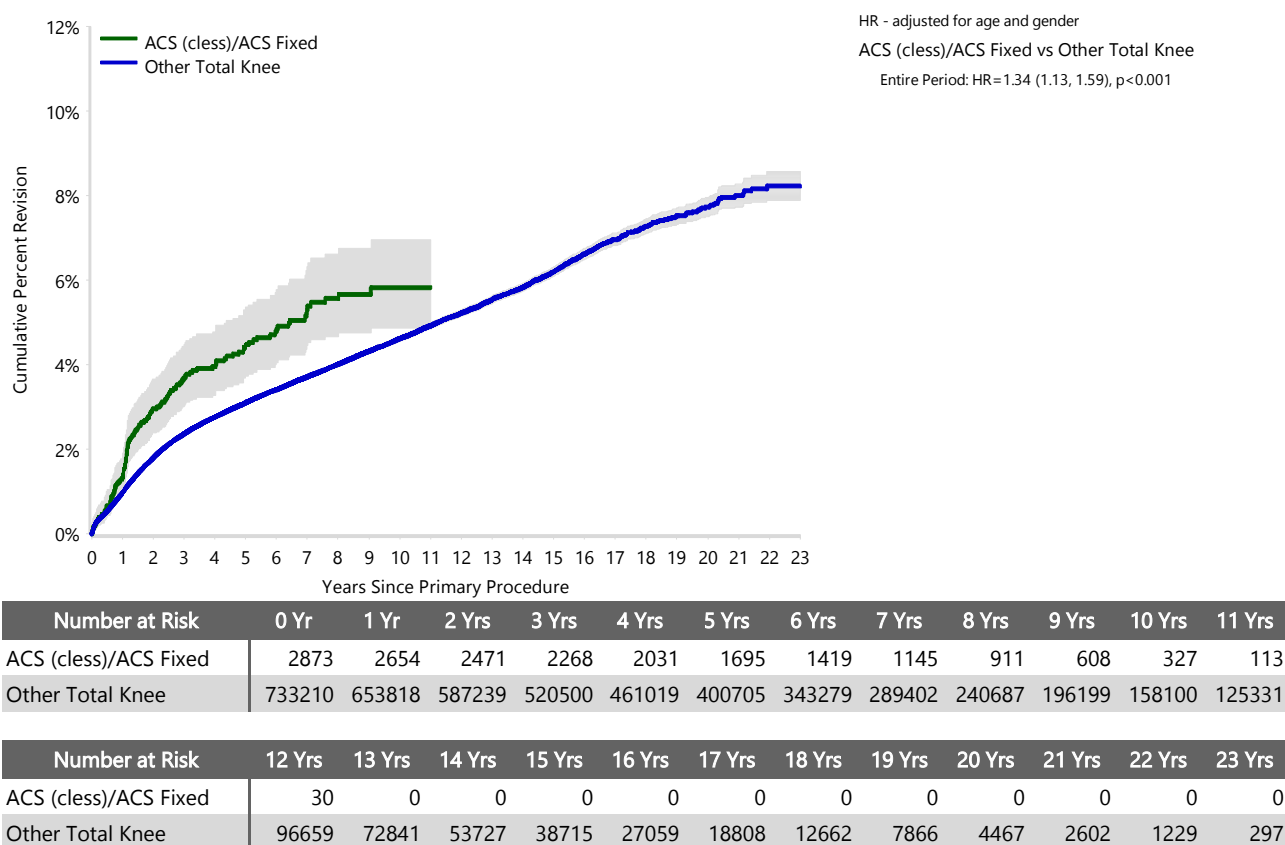
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the ACS (cless)/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



Note: Prostheses no longer used in 2023 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

Primary Diagnosis	ACS (cless)/ACS Fixed		Other Total Knee	
	Number	Percent	Number	Percent
Osteoarthritis	132	100.0	23994	96.8
Rheumatoid Arthritis			313	1.3
Tumour			178	0.7
Other Inflammatory Arthritis			153	0.6
Osteonecrosis			89	0.4
Fracture			48	0.2
Other			23	0.1
Chondrocalcinosis			1	0.0
TOTAL	132	100.0	24799	100.0

Note: Prostheses no longer used in 2023 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 12.7 Years)

Revision Diagnosis	ACS (class)/ACS Fixed			Other Total Knee		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	27	0.9	20.5	6854	0.9	28.6
Loosening	38	1.3	28.8	5044	0.7	21.0
Instability	11	0.4	8.3	2485	0.3	10.4
Pain	14	0.5	10.6	1772	0.2	7.4
Patella Erosion	4	0.1	3.0	1690	0.2	7.0
Patellofemoral Pain	19	0.7	14.4	1574	0.2	6.6
Arthrofibrosis	2	0.1	1.5	1014	0.1	4.2
Fracture	1	0.0	0.8	927	0.1	3.9
Malalignment	5	0.2	3.8	516	0.1	2.2
Wear Tibial Insert	1	0.0	0.8	288	0.0	1.2
Lysis	3	0.1	2.3	254	0.0	1.1
Incorrect Sizing	3	0.1	2.3	225	0.0	0.9
Patella Maltracking	1	0.0	0.8	178	0.0	0.7
Implant Breakage Tibial Insert				155	0.0	0.6
Bearing Dislocation				137	0.0	0.6
Implant Breakage Patella				127	0.0	0.5
Metal Related Pathology				95	0.0	0.4
Prosthesis Dislocation	1	0.0	0.8	78	0.0	0.3
Synovitis				64	0.0	0.3
Osteonecrosis				50	0.0	0.2
Implant Breakage Femoral				39	0.0	0.2
Wear Patella				35	0.0	0.1
Implant Breakage Tibial				34	0.0	0.1
Tumour				29	0.0	0.1
Heterotopic Bone				12	0.0	0.1
Progression Of Disease				6	0.0	0.0
Wear Tibial				5	0.0	0.0
Patella Dislocation				2	0.0	0.0
Incorrect Side				1	0.0	0.0
Wear Femoral				1	0.0	0.0
Other	2	0.1	1.5	299	0.0	1.2
N Revision	132	4.6	100.0	23990	3.3	100.0
N Primary	2873			733210		

Note: This table is restricted to revisions within 12.7 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2023 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 (cless)/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

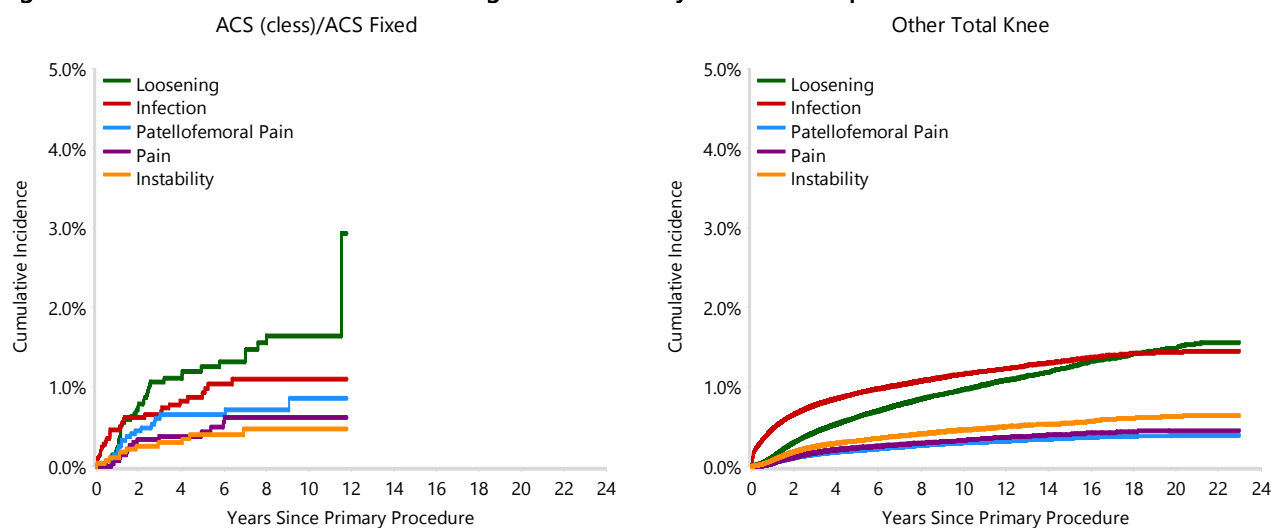


TABLE 5

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 12.7 Years)

Type of Revision	ACS (cless)/ACS Fixed		Other Total Knee	
	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	32	24.2	5616	23.4
Tibial Component	20	15.2	1814	7.6
Femoral Component	9	6.8	1239	5.2
Cement Spacer	3	2.3	1147	4.8
Removal of Prostheses			126	0.5
Total Femoral			21	0.1
Reinsertion of Components			7	0.0
N Major	64	48.5	9970	41.6
Insert Only	21	15.9	7308	30.5
Patella Only	33	25.0	4203	17.5
Insert/Patella	14	10.6	2444	10.2
Minor Components			57	0.2
Cement Only			8	0.0
N Minor	68	51.5	14020	58.4
TOTAL	132	100.0	23990	100.0

Note: This table is restricted to revisions within 12.7 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2023 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	58	1298
Hybrid (Tibial Cemented)	74	1568
Hybrid (Tibial Cementless)	0	1
TOTAL	132	2873

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	132	2873
TOTAL	132	2873

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	132	2873
TOTAL	132	2873

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	120	2762
Posterior Stabilised	12	111
TOTAL	132	2873

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	27	983
	QLD	11	135
	WA	56	566
	SA	38	1188
Other Total Knee	NSW	7326	251258
	VIC	5347	147683
	QLD	5350	153522
	WA	3008	79559
	SA	2718	62823
	TAS	458	18786
	ACT/NT	592	19579
TOTAL		24931	736083

Note: Prostheses no longer used in 2023 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 2023 has a maximum of one year to be revised, whereas a primary procedure performed in 2021 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	9	118
2013	33	284
2014	29	337
2015	17	331
2016	11	238
2017	12	266
2018	6	259
2019	3	319
2020	5	209
2021	2	169
2022	3	125
2023	0	177
TOTAL	132	2873

TABLE 12

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

Femoral Range	Tibial Range	N Revised	N Total
42003102-42003118	42010402-42010419	27	595
	42010422-42010439	37	675
42003202-42005116	42010402-42010419	1	63
	42010422-42010439	0	141
42006602-42006618	42010402-42010419	9	61
	42010422-42010439	3	50
42210303-42210316	42010402-42010419	21	582
	42010422-42010439	34	706
TOTAL		132	2873