

LCS Duofix Total Knee Investigation

Note: This analysis compares the LCS Duofix femoral prosthesis with all other total knee prostheses.

This prosthesis 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 LCS Duofix total knee prosthesis 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)
LCS Duofix	720	4866	62806	1.15 (1.06, 1.23)
Other Total Knee	27284	791430	5145922	0.53 (0.52, 0.54)
TOTAL	28004	796296	5208728	0.54 (0.53, 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 LCS Duofix total knee prosthesis 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
LCS Duofix	1.5 (1.2, 1.9)	3.7 (3.2, 4.3)	5.9 (5.3, 6.6)	8.1 (7.3, 8.9)	9.7 (8.9, 10.6)	10.9 (10.1, 11.9)
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 (3.1, 3.1)	3.4 (3.4, 3.5)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
LCS Duofix	11.7 (10.8, 12.7)	12.2 (11.3, 13.2)	12.6 (11.7, 13.6)	13.0 (12.1, 14.1)	13.4 (12.5, 14.4)	13.8 (12.9, 14.9)
Other Total Knee	3.7 (3.7, 3.8)	4.0 (4.0, 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
LCS Duofix	14.4 (13.4, 15.4)	14.7 (13.7, 15.7)	15.2 (14.2, 16.3)	15.7 (14.7, 16.8)	16.3 (15.2, 17.5)	16.8 (15.7, 18.0)
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
LCS Duofix	17.0 (15.9, 18.3)						
Other Total Knee	7.9 (7.7, 8.0)	8.1 (7.9, 8.3)	8.5 (8.2, 8.7)	8.7 (8.4, 9.0)	8.8 (8.6, 9.2)	9.1 (8.7, 9.5)	9.5 (8.8, 10.2)

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

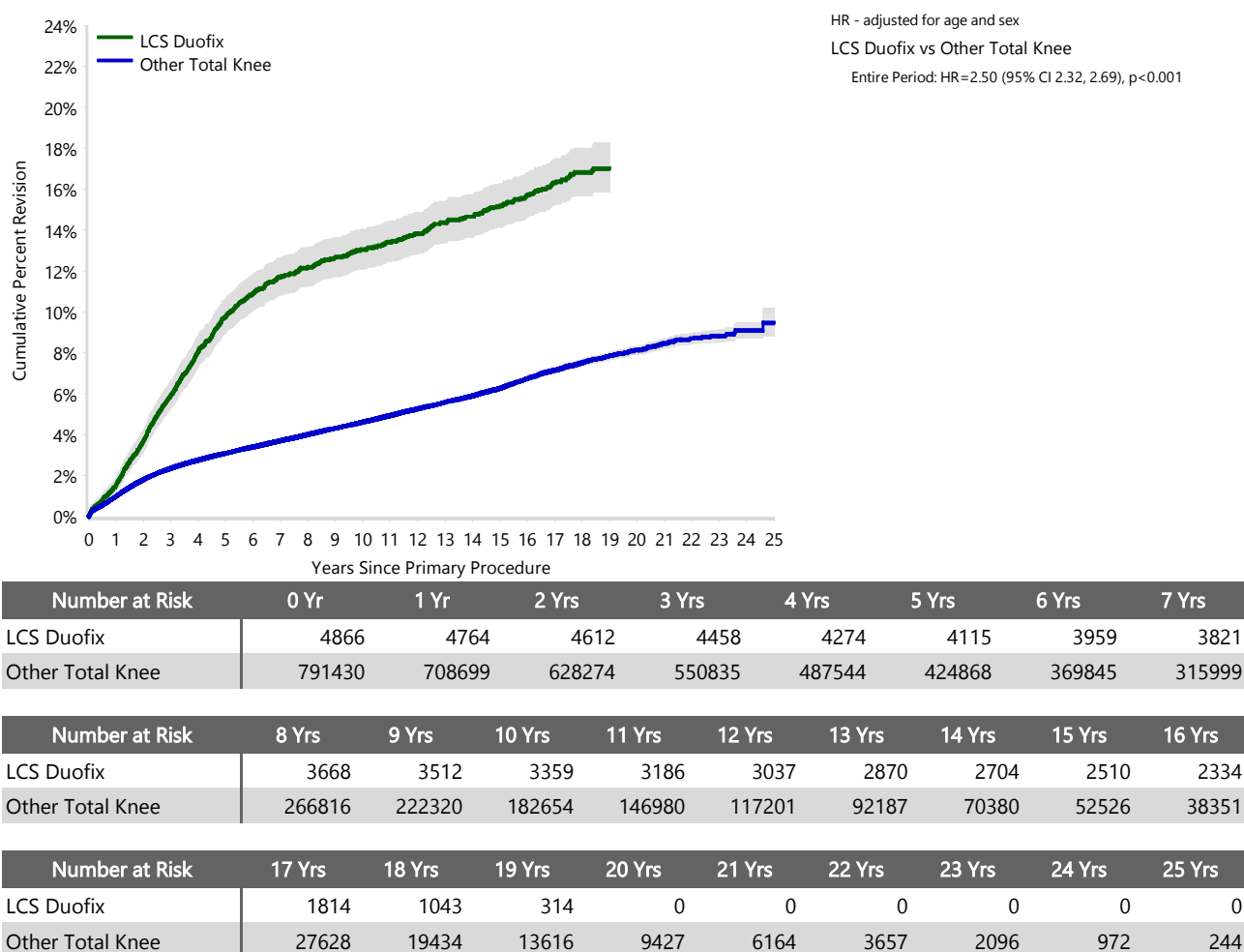
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the LCS Duofix total knee prosthesis 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 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

Primary Diagnosis	LCS Duofix		Other Total Knee	
	Number	Percent	Number	Percent
Osteoarthritis	707	98.2	26392	96.7
Rheumatoid Arthritis	3	0.4	330	1.2
Tumour			199	0.7
Other Inflammatory Arthritis	8	1.1	177	0.6
Osteonecrosis	2	0.3	104	0.4
Fracture			55	0.2
Other			26	0.1
Chondrocalcinosis			1	0.0
TOTAL	720	100.0	27284	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 19.7 Years)

Revision Diagnosis	Number	LCS Duofix		Number	Other Total Knee	
		% Primaries Revised	% Revisions		% Primaries Revised	% Revisions
Infection	90	1.8	12.5	7882	1.0	29.0
Loosening	162	3.3	22.5	5750	0.7	21.1
Instability	13	0.3	1.8	2870	0.4	10.5
Patella Erosion	20	0.4	2.8	2027	0.3	7.4
Pain	43	0.9	6.0	1865	0.2	6.9
Patellofemoral Pain	23	0.5	3.2	1555	0.2	5.7
Arthrofibrosis	10	0.2	1.4	1181	0.1	4.3
Fracture	13	0.3	1.8	1133	0.1	4.2
Malalignment	4	0.1	0.6	511	0.1	1.9
Wear Tibial Insert	13	0.3	1.8	371	0.0	1.4
Lysis	48	1.0	6.7	288	0.0	1.1
Implant Breakage Tibial Insert	5	0.1	0.7	252	0.0	0.9
Metal Related Pathology	242	5.0	33.6	114	0.0	0.4
Incorrect Sizing	3	0.1	0.4	218	0.0	0.8
Patella Maltracking	1	0.0	0.1	192	0.0	0.7
Bearing Dislocation	4	0.1	0.6	150	0.0	0.6
Implant Breakage Patella	1	0.0	0.1	147	0.0	0.5
Prosthesis Dislocation				78	0.0	0.3
Synovitis	13	0.3	1.8	64	0.0	0.2
Wear Patella				52	0.0	0.2
Osteonecrosis				51	0.0	0.2
Implant Breakage Femoral	4	0.1	0.6	49	0.0	0.2
Implant Breakage Tibial	1	0.0	0.1	39	0.0	0.1
Tumour	1	0.0	0.1	36	0.0	0.1
Heterotopic Bone				16	0.0	0.1
Progression Of Disease				8	0.0	0.0
Wear Tibial	1	0.0	0.1	6	0.0	0.0
Patella Dislocation				3	0.0	0.0
Incorrect Side				1	0.0	0.0
Wear Femoral	1	0.0	0.1	1	0.0	0.0
Other	4	0.1	0.6	314	0.0	1.2
N Revision	720	14.8	100.0	27224	3.4	100.0
N Primary	4866			791430		

Note: This table is restricted to revisions within 19.7 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 LCS Duofix total knee prosthesis. A comparative graph is provided of the cumulative incidence for the same reasons for revisions for all other total knee prostheses.

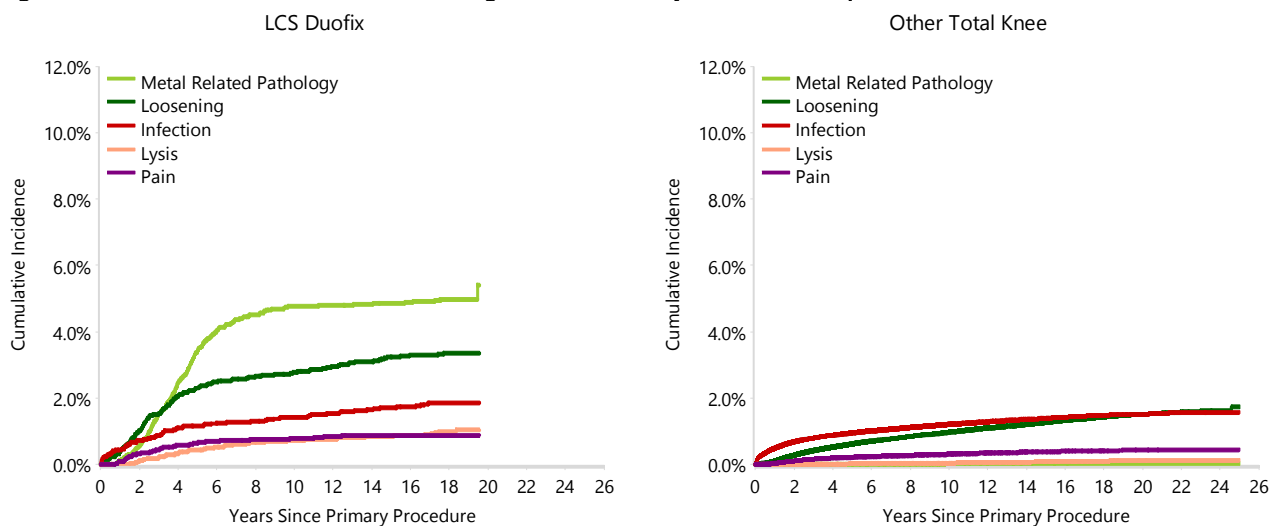
Figure 2: Cumulative Incidence Revision Diagnosis for Primary Total Knee Replacement

TABLE 5

Type of Revision Performed for Primary Total Knee Replacement

This analysis identifies the components used in the revision of the LCS Duofix total knee prosthesis 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 LCS Duofix total knee prosthesis compared to all other total knee prostheses.

Table 5: Primary Total Knee Replacement - Type of Revision (Follow-up Limited to 19.7 Years)

Type of Revision	LCS Duofix		Other Total Knee	
	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	494	68.6	6649	24.4
Tibial Component	10	1.4	1907	7.0
Femoral Component	37	5.1	1313	4.8
Cement Spacer	29	4.0	1137	4.2
Removal of Prostheses	2	0.3	134	0.5
Total Femoral			23	0.1
Reinsertion of Components			8	0.0
N Major	572	79.4	11171	41.0
Insert Only	55	7.6	8564	31.5
Patella Only	53	7.4	4489	16.5
Insert/Patella	40	5.6	2923	10.7
Minor Components			66	0.2
Cement Only			11	0.0
N Minor	148	20.6	16053	59.0
TOTAL	720	100.0	27224	100.0

Note: This table is restricted to revisions within 19.7 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 LCS Duofix 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 LCS Duofix Primary Total Knee Replacement by Fixation

Fixation	N Revised	N Total
Cemented	1	6
Cementless	638	4022
Hybrid (Tibial Cemented)	80	829
Hybrid (Tibial Cementless)	1	9
TOTAL	720	4866

TABLE 7**Revision Rates of LCS Duofix 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 prosthesis are listed.

Table 7: Revised Number of LCS Duofix Primary Total Knee Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Non XLPE	720	4865
Unknown	0	1
TOTAL	720	4866

TABLE 8**Revision Rates of LCS Duofix 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 prosthesis are listed.

Table 8: Revised Number of LCS Duofix Primary Total Knee Replacement by Bearing Mobility

Bearing Mobility	N Revised	N Total
Rotating	675	4524
Rotating - Sliding	45	341
Unknown	0	1
TOTAL	720	4866

TABLE 9**Revision Rates of LCS Duofix 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 prosthesis are listed.

Table 9: Revised Number of LCS Duofix Primary Total Knee Replacement by Stability

Stability	N Revised	N Total
Minimally Stabilised	720	4865
Unknown	0	1
TOTAL	720	4866

TABLE 10

Revision Rates of Primary Total Knee Replacement by State

This enables a state by state variation to be identified for the LCS Duofix total knee prosthesis 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
LCS Duofix	NSW	172	1110
	VIC	89	789
	QLD	202	1540
	WA	71	525
	SA	118	548
	TAS	36	277
	ACT/NT	32	77
Other Total Knee	NSW	7550	259497
	VIC	6020	163565
	QLD	5789	167244
	WA	3600	92841
	SA	3220	73114
	TAS	475	15075
	ACT/NT	630	20094
TOTAL		28004	796296

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

TABLE 11**Number of Revisions of LCS Duofix Primary Total Knee Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the LCS Duofix total knee prosthesis. 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 LCS Duofix Primary Total Knee Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2006	120	844
2007	218	1636
2008	225	1532
2009	157	854
TOTAL	720	4866

TABLE 12

Revision Rates of LCS Duofix 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 LCS Duofix 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				
LCS Duofix	129407010-129408070	LCS COMPLETE DUOFIX FEMORAL HA COATED	NO	HA COATED

Table 12: Revised Number of LCS Duofix Primary Total Knee Replacement by Catalogue Number Range

Femoral Range	N Revised	N Total
129407010-129408070	720	4866
TOTAL	720	4866

TABLE 13**Revision Rates of LCS Duofix Primary Total Knee Replacement by Component**

A prosthesis may be combined with multiple components. This analysis has been undertaken to determine if the revision rate varies according to the component with which it is combined.

Table 13: Revised Number of LCS Duofix Primary Total Knee Replacement by Tibial Component

Tibial Component	N Revised	N Total
LCS	2	5
MBT	153	1194
MBT Duofix	565	3667
TOTAL	720	4866