

Mutars/Mutars Total Knee Investigation

Note: This analysis compares the Mutars/Mutars 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-2023>.

Note: Procedures using prostheses with no recorded use in 2022 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Knee Replacement

The revision rate of the Mutars/Mutars 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)
Mutars/Mutars	51	357	828	6.16 (4.59, 8.10)
Other Total Knee	26785	757592	5068952	0.53 (0.52, 0.53)
TOTAL	26836	757949	5069780	0.53 (0.52, 0.54)

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Mutars/Mutars 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
Mutars/Mutars	6.5 (4.2, 9.9)	12.2 (8.8, 16.9)	17.2 (12.8, 23.0)	21.9 (16.1, 29.4)				
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)	3.7 (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
Mutars/Mutars							
Other Total Knee	4.3 (4.3, 4.4)	4.6 (4.6, 4.7)	4.9 (4.9, 5.0)	5.2 (5.1, 5.3)	5.5 (5.5, 5.6)	5.9 (5.8, 5.9)	6.2 (6.1, 6.3)

CPR	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs
Mutars/Mutars							
Other Total Knee	6.6 (6.5, 6.8)	7.0 (6.9, 7.1)	7.3 (7.2, 7.5)	7.6 (7.4, 7.8)	7.8 (7.6, 8.0)	8.0 (7.7, 8.2)	8.2 (7.9, 8.6)

Note: Prostheses no longer used in 2022 are excluded from the comparator.

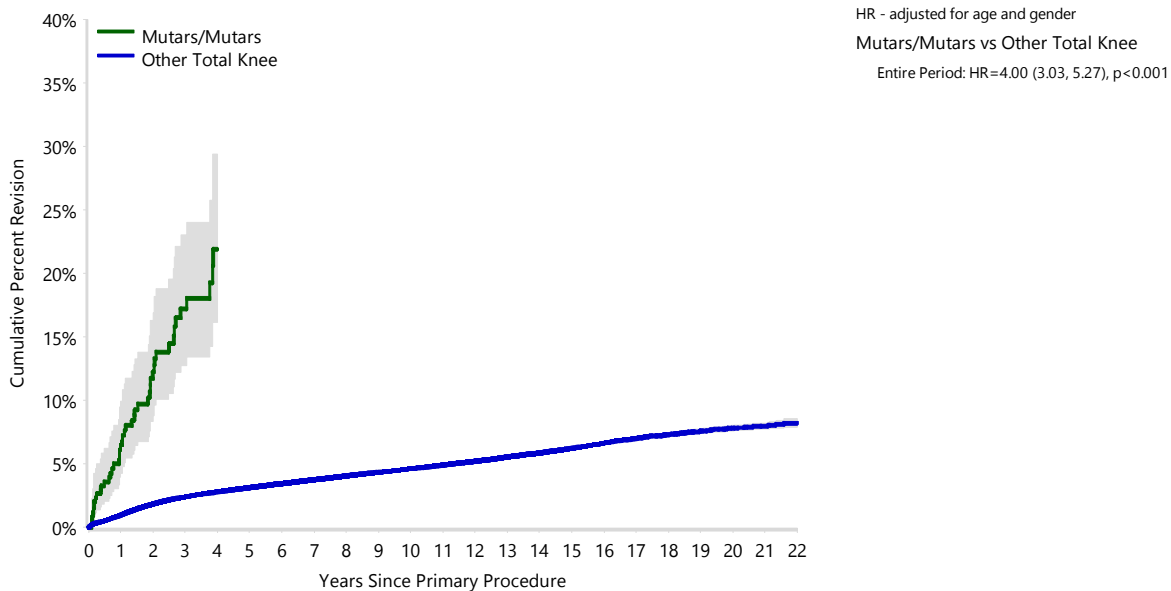
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Mutars/Mutars 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
Mutars/Mutars	357	247	169	107	56	39	20	12	6	3	0	0
Other Total Knee	757592	689635	619447	556726	492745	431091	372717	318114	267223	221557	180409	143443

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
Mutars/Mutars	0	0	0	0	0	0	0	0	0	0	0
Other Total Knee	111922	85787	65049	47997	34991	24735	16433	9944	5486	2318	538

Note: Prostheses no longer used in 2022 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	Mutars/Mutars		Other Total Knee	
	Number	Percent	Number	Percent
Osteoarthritis	15	29.4	25989	97.0
Rheumatoid Arthritis	1	2.0	341	1.3
Other Inflammatory Arthritis	1	2.0	159	0.6
Tumour	29	56.9	133	0.5
Osteonecrosis			101	0.4
Fracture	5	9.8	43	0.2
Other			18	0.1
Chondrocalcinosis			1	0.0
TOTAL	51	100.0	26785	100.0

Note: Prostheses no longer used in 2022 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 9.8 Years)

Revision Diagnosis	Mutars/Mutars			Other Total Knee		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	17	4.8	33.3	7008	0.9	28.6
Loosening	13	3.6	25.5	5357	0.7	21.8
Instability	2	0.6	3.9	2431	0.3	9.9
Pain	2	0.6	3.9	1892	0.2	7.7
Patellofemoral Pain				1829	0.2	7.5
Patella Erosion				1542	0.2	6.3
Arthrofibrosis				1018	0.1	4.1
Fracture	3	0.8	5.9	855	0.1	3.5
Malalignment				581	0.1	2.4
Incorrect Sizing				259	0.0	1.1
Lysis				232	0.0	0.9
Wear Tibial Insert				216	0.0	0.9
Patella Maltracking				183	0.0	0.7
Bearing Dislocation				146	0.0	0.6
Implant Breakage Patella				128	0.0	0.5
Implant Breakage Tibial Insert				123	0.0	0.5
Metal Related Pathology	3	0.8	5.9	93	0.0	0.4
Prosthesis Dislocation				79	0.0	0.3
Synovitis				68	0.0	0.3
Osteonecrosis				54	0.0	0.2
Implant Breakage Tibial				37	0.0	0.2
Wear Patella				27	0.0	0.1
Tumour	4	1.1	7.8	25	0.0	0.1
Implant Breakage Femoral	6	1.7	11.8	24	0.0	0.1
Heterotopic Bone				12	0.0	0.0
Wear Tibial				7	0.0	0.0
Progression Of Disease				4	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	1	0.3	2.0	308	0.0	1.3
N Revision	51	14.3	100.0	24542	3.2	100.0
N Primary	357			757592		

Note: This table is restricted to revisions within 9.8 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2022 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 Mutars/Mutars 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

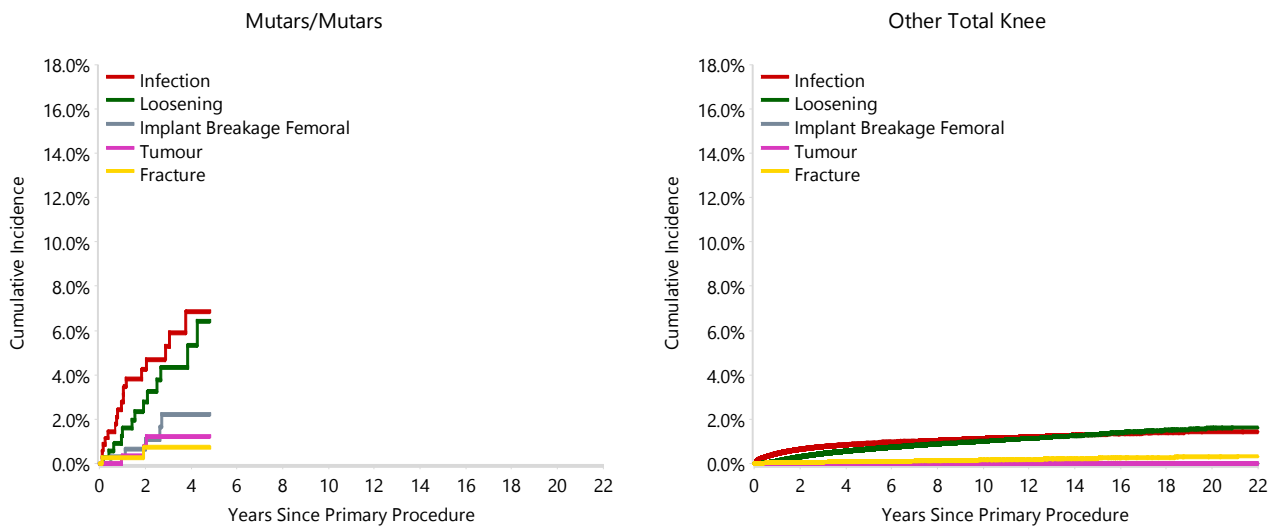


TABLE 5

Type of Revision Performed for Primary Total Knee Replacement

This analysis identifies the components used in the revision of the Mutars/Mutars 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 Mutars/Mutars total knee combination compared to all other total knee prostheses.

Table 5: Primary Total Knee Replacement - Type of Revision (Follow-up Limited to 9.8 Years)

Type of Revision	Mutars/Mutars		Other Total Knee	
	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	7	13.7	5730	23.3
Tibial Component	3	5.9	2043	8.3
Cement Spacer	3	5.9	1304	5.3
Femoral Component	22	43.1	1266	5.2
Removal of Prostheses			147	0.6
Total Femoral	3	5.9	19	0.1
Reinsertion of Components			12	0.0
N Major	38	74.5	10521	42.9
Insert Only	7	13.7	7174	29.2
Patella Only	2	3.9	4475	18.2
Insert/Patella	3	5.9	2296	9.4
Minor Components	1	2.0	59	0.2
Cement Only			17	0.1
N Minor	13	25.5	14021	57.1
TOTAL	51	100.0	24542	100.0

Note: This table is restricted to revisions within 9.8 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 6**Revision Rates of Mutars/Mutars 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 Mutars/Mutars Primary Total Knee Replacement by Fixation

Fixation	N Revised	N Total
Cemented	40	309
Cementless	0	3
Hybrid (Tibial Cemented)	11	38
Hybrid (Tibial Cementless)	0	7
TOTAL	51	357

TABLE 7**Revision Rates of Mutars/Mutars 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 Mutars/Mutars Primary Total Knee Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Non XLPE	51	356
Unknown	0	1
TOTAL	51	357

TABLE 8**Revision Rates of Mutars/Mutars 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 Mutars/Mutars Primary Total Knee Replacement by Bearing Mobility

Bearing Mobility	N Revised	N Total
Fixed	15	57
Rotating	36	299
Unknown	0	1
TOTAL	51	357

TABLE 9**Revision Rates of Mutars/Mutars 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 Mutars/Mutars Primary Total Knee Replacement by Stability

Stability	N Revised	N Total
Hinged	36	299
Minimally Stabilised	15	57
Unknown	0	1
TOTAL	51	357

TABLE 10

Revision Rates of Primary Total Knee Replacement by State

This enables a state by state variation to be identified for the Mutars/Mutars 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
Mutars/Mutars	NSW	9	57
	VIC	17	65
	QLD	8	125
	WA	13	67
	SA	4	32
	TAS	0	10
	ACT/NT	0	1
Other Total Knee	NSW	7950	262376
	VIC	5808	152982
	QLD	5758	156883
	WA	3232	81072
	SA	2963	66387
	TAS	437	18123
	ACT/NT	637	19769
TOTAL		26836	757949

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 11**Number of Revisions of Mutars/Mutars Primary Total Knee Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the Mutars/Mutars 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 2022 has a maximum of one year to be revised, whereas a primary procedure performed in 2020 has a maximum of three years to be revised.

Table 11: Number of Revisions of Mutars/Mutars Primary Total Knee Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2012	0	2
2013	2	12
2014	1	8
2015	8	15
2016	4	14
2017	3	26
2018	12	32
2019	10	63
2020	4	56
2021	3	63
2022	4	66
TOTAL	51	357

TABLE 12

Revision Rates of Mutars/Mutars 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 Mutars/Mutars 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	Material	Coating
Femoral					
Mutars	57200030-57200032	DISTAL FEMUR MOM INCL SAFETY SCREW	NO		
Mutars	57200040N-57200048N	DISTAL FEMUR MOM INCL SAFETY SCREW TIN COATED	NO		TIN
Mutars	57200040S-57200090S	DISTAL FEMUR MOM SILVER COATED	NO		SILVER
Mutars	57200040SN-57200048SN	DISTAL FEMUR MOM INCL SAFETY SCREW SILVER TIN COATED	NO		TIN
Mutars	57200210N-57200235N	GENUX FEMORAL COMPONENT CEMENTLESS	NO		TIN
Mutars	57200310-57200535	GENUX HINGE FEMORAL COMPONENT	YES		
Mutars	57200310N-57200335N	GENUX HINGE FEMORAL COMPONENT TIN COATED	YES		TIN
Mutars	57200500N-57200545N	GENUX MK FEMORAL COMPONENT TIN	YES		TIN
Mutars	67700011S-67700021S	ARTHRODESIS FEMORAL COMPONENT	NO		SILVER
Tibial					
Mutars	57500003-57500003	PROXIMAL TIBIA	YES	METAL	
Mutars	57500003S-57500005S	PROXIMAL TIBIA	NO	METAL	SILVER
Mutars	57503010N-57503010N	CUSTOM MADE BIOXPAND TIBIAL PLATEAU	NO		
Mutars	57510300N-57510310N	TIBIAL PLATEAU CEMENTED COATED WITH TIN	YES		TIN
Mutars	57510300S-57510310S	GENUX SILVER TIBIAL PLATEAU	YES		SILVER
Mutars	57510603N-57510606N	GENUX MK TIBIA INCL COUNTER SCREW	YES		TIN
Mutars	67700031S-67700031S	ARTHRODESIS TIBIAL COMPONENT	NO	METAL	SILVER

Table 12: Revised Number of Mutars/Mutars Primary Total Knee Replacement by Catalogue Number Range

Femoral Range	Tibial Range	N Revised	N Total
57200030-57200032	57510603N-57510606N	0	1
57200040N-57200048N	57510603N-57510606N	0	2
57200040S-57200090S	57503010N-57503010N	1	1
	57510300S-57510310S	1	3
	57510603N-57510606N	0	2
57200040SN-57200048SN	57510300S-57510310S	10	29
	57510603N-57510606N	26	137
57200210N-57200235N	57500003S-57500005S	0	3
57200310-57200535	57500003-57500003	0	1
57200310N-57200335N	57500003S-57500005S	1	3
	57510300N-57510310N	1	2
	57510300S-57510310S	0	5
57200500N-57200545N	57500003S-57500005S	1	15
	57510300S-57510310S	1	2
	57510603N-57510606N	9	150
67700011S-67700021S	67700031S-67700031S	0	1
TOTAL		51	357