

Trekking/Trekking Total Knee Investigation

Note: This analysis compares the Trekking/Trekking 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-2022>.

Note: Procedures using prostheses with no recorded use in 2021 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Knee Replacement

The revision rate of the Trekking/Trekking 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)
Trekking/Trekking	65	1263	7104	0.91 (0.71, 1.17)
Other Total Knee	25996	726432	4722020	0.55 (0.54, 0.56)
TOTAL	26061	727695	4729125	0.55 (0.54, 0.56)

Note: Prostheses no longer used in 2021 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Trekking/Trekking 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
Trekking/Trekking	2.3 (1.6, 3.3)	3.2 (2.4, 4.4)	3.8 (2.8, 5.0)	4.6 (3.5, 5.9)	4.9 (3.7, 6.3)	5.5 (4.3, 7.1)	6.1 (4.7, 7.9)
Other Total Knee	1.0 (1.0, 1.0)	1.9 (1.9, 1.9)	2.5 (2.4, 2.5)	2.9 (2.9, 2.9)	3.2 (3.2, 3.3)	3.6 (3.5, 3.6)	3.9 (3.8, 3.9)

CPR	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs
Trekking/Trekking	6.1 (4.7, 7.9)	6.5 (5.0, 8.5)	6.5 (5.0, 8.5)				
Other Total Knee	4.2 (4.1, 4.2)	4.5 (4.4, 4.5)	4.8 (4.7, 4.8)	5.1 (5.0, 5.1)	5.4 (5.3, 5.5)	5.7 (5.6, 5.8)	6.0 (6.0, 6.1)

CPR	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Trekking/Trekking							
Other Total Knee	6.4 (6.3, 6.6)	6.9 (6.7, 7.0)	7.3 (7.1, 7.4)	7.6 (7.4, 7.8)	7.9 (7.7, 8.1)	8.2 (7.9, 8.4)	8.2 (8.0, 8.5)

Note: Prostheses no longer used in 2021 are excluded from the comparator.

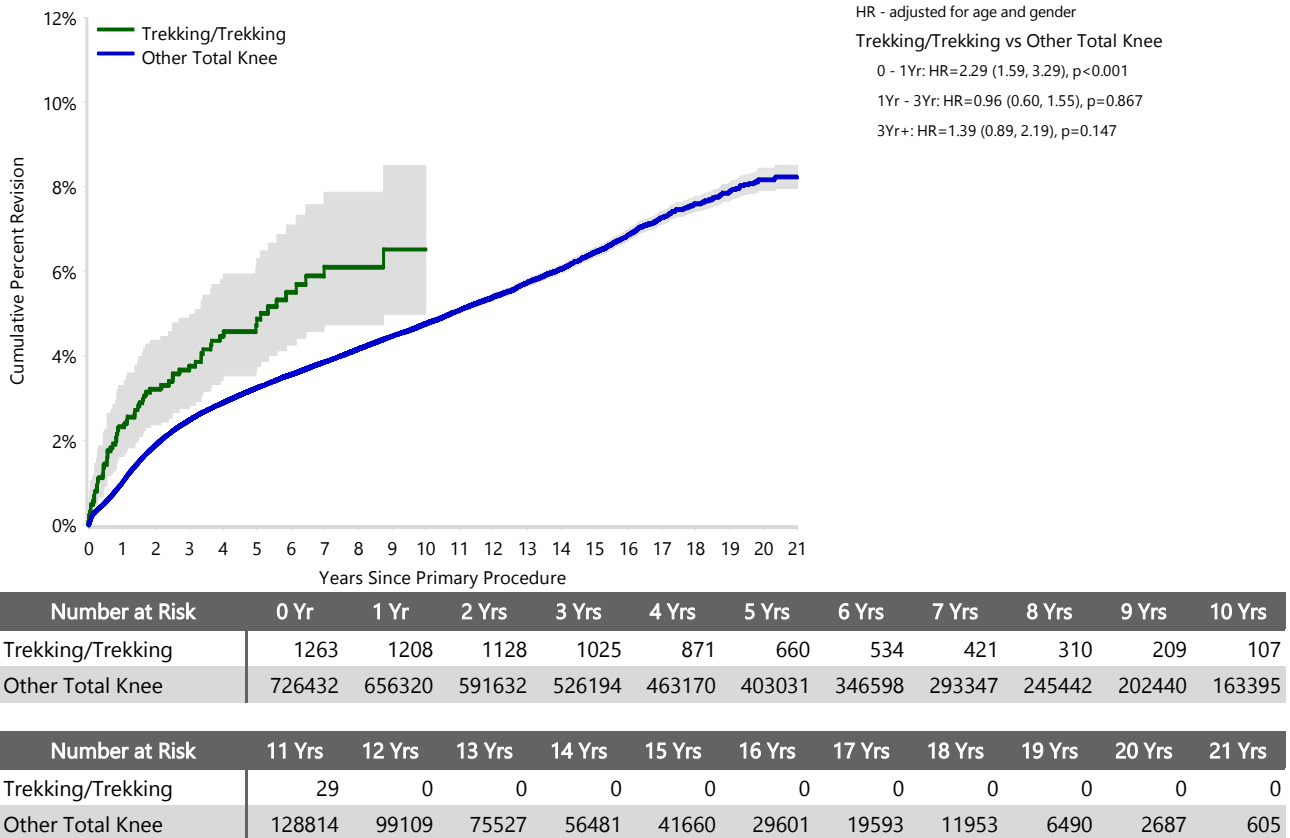
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Knee Replacement

The yearly cumulative percent revision of the Trekking/Trekking 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 2021 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	Trekking/Trekking		Other Total Knee	
	Number	Percent	Number	Percent
Osteoarthritis	62	95.4	25189	96.9
Rheumatoid Arthritis			331	1.3
Other Inflammatory Arthritis	3	4.6	158	0.6
Tumour			151	0.6
Osteonecrosis			98	0.4
Fracture			49	0.2
Other			19	0.1
Chondrocalcinosis			1	0.0
TOTAL	65	100.0	25996	100.0

Note: Prostheses no longer used in 2021 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 11.5 Years)

Revision Diagnosis	Trekking/Trekking			Other Total Knee		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	17	1.3	26.2	6777	0.9	27.4
Loosening	22	1.7	33.8	5466	0.8	22.1
Instability	6	0.5	9.2	2383	0.3	9.6
Pain	1	0.1	1.5	2000	0.3	8.1
Patellofemoral Pain	3	0.2	4.6	1990	0.3	8.0
Patella Erosion	3	0.2	4.6	1558	0.2	6.3
Arthrofibrosis	4	0.3	6.2	982	0.1	4.0
Fracture	2	0.2	3.1	854	0.1	3.5
Malalignment				591	0.1	2.4
Lysis	1	0.1	1.5	279	0.0	1.1
Wear Tibial Insert	1	0.1	1.5	264	0.0	1.1
Incorrect Sizing	2	0.2	3.1	256	0.0	1.0
Patella Maltracking				181	0.0	0.7
Bearing Dislocation				148	0.0	0.6
Implant Breakage Patella				130	0.0	0.5
Implant Breakage Tibial Insert	1	0.1	1.5	125	0.0	0.5
Metal Related Pathology				103	0.0	0.4
Prosthesis Dislocation				76	0.0	0.3
Synovitis				71	0.0	0.3
Osteonecrosis	1	0.1	1.5	57	0.0	0.2
Implant Breakage Tibial				39	0.0	0.2
Implant Breakage Femoral				30	0.0	0.1
Tumour				26	0.0	0.1
Wear Patella				26	0.0	0.1
Heterotopic Bone				13	0.0	0.1
Wear Tibial				8	0.0	0.0
Progression Of Disease				4	0.0	0.0
Patella Dislocation				2	0.0	0.0
Wear Femoral				2	0.0	0.0
Incorrect Side				1	0.0	0.0
Other	1	0.1	1.5	297	0.0	1.2
N Revision	65	5.1	100.0	24739	3.4	100.0
N Primary	1263			726432		

Note: This table is restricted to revisions within 11.5 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2021 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 Trekking/Trekking 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

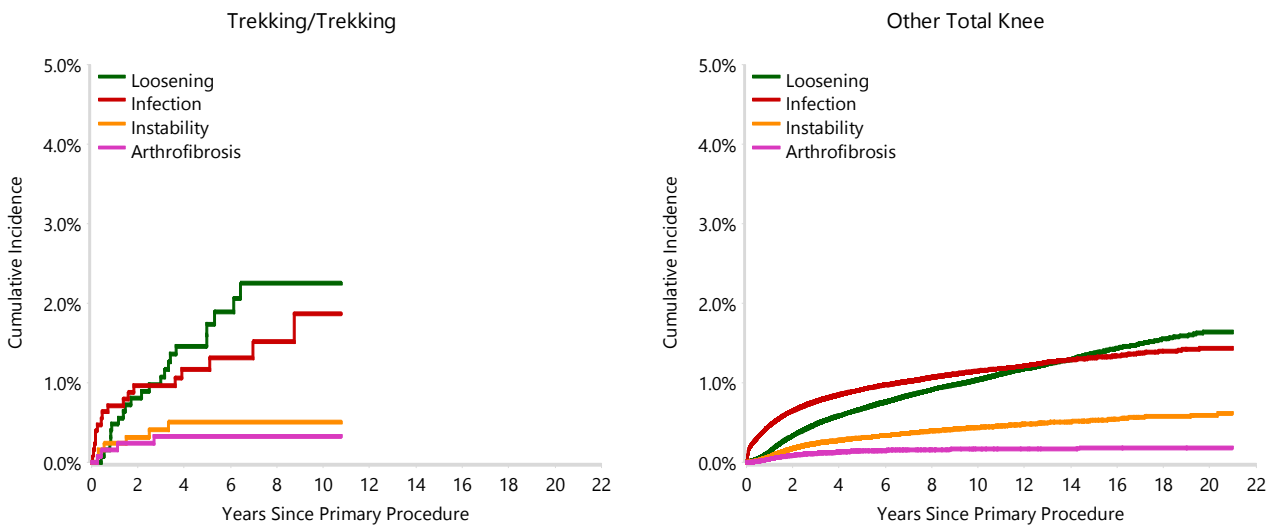


TABLE 5

Type of Revision Performed for Primary Total Knee Replacement

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

Table 5: Primary Total Knee Replacement - Type of Revision (Follow-up Limited to 11.5 Years)

Type of Revision	Trekking/Trekking		Other Total Knee	
	Number	Percent	Number	Percent
TKR (Tibial/Femoral)	27	41.5	5867	23.7
Tibial Component	3	4.6	2049	8.3
Cement Spacer	4	6.2	1316	5.3
Femoral Component	7	10.8	1288	5.2
Removal of Prostheses	1	1.5	146	0.6
Total Femoral			17	0.1
Reinsertion of Components			11	0.0
N Major	42	64.6	10694	43.2
Insert Only	12	18.5	6880	27.8
Patella Only	8	12.3	4647	18.8
Insert/Patella	3	4.6	2445	9.9
Minor Components			59	0.2
Cement Only			14	0.1
N Minor	23	35.4	14045	56.8
TOTAL	65	100.0	24739	100.0

Note: This table is restricted to revisions within 11.5 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2021 are excluded from the comparator.

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

Fixation	N Revised	N Total
Cemented	24	394
Cementless	21	309
Hybrid (Tibial Cemented)	19	555
Hybrid (Tibial Cementless)	1	5
TOTAL	65	1263

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

Bearing Surface	N Revised	N Total
Non XLPE	61	1191
XLPE + Antioxidant	4	72
TOTAL	65	1263

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

Bearing Mobility	N Revised	N Total
Fixed	13	513
Rotating	52	750
TOTAL	65	1263

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

Stability	N Revised	N Total
Minimally Stabilised	32	832
Posterior Stabilised	33	431
TOTAL	65	1263

TABLE 10

Revision Rates of Primary Total Knee Replacement by State

This enables a state by state variation to be identified for the Trekking/Trekking 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
Trekking/Trekking	NSW	16	105
	VIC	24	407
	QLD	10	422
	WA	4	58
	TAS	2	19
	ACT/NT	9	252
	Other Total Knee	NSW	7706
	VIC	5529	144080
	QLD	5680	152749
	WA	3231	77847
	SA	2837	63440
	TAS	416	16866
	ACT/NT	597	18434
TOTAL		26061	727695

Note: Prostheses no longer used in 2021 are excluded from the comparator.

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

This analysis details the number of prostheses reported each year to the Registry for the Trekking/Trekking 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 2021 has a maximum of one year to be revised, whereas a primary procedure performed in 2019 has a maximum of three years to be revised.

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

Year of Implant	Number Revised	Total Number
2010	5	35
2011	7	102
2012	12	133
2013	7	107
2014	3	108
2015	3	106
2016	9	129
2017	6	216
2018	6	143
2019	4	99
2020	3	65
2021	0	20
TOTAL	65	1263

TABLE 12

Revision Rates of Trekking/Trekking 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 Trekking/Trekking 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				
Trekking	GSP0001-GSP0105	FEMORAL COMPONENT CR	YES	
Trekking	GSP0001P-GSP0105P	CR PRESSFIT FEMORAL	NO	HA COATED
Trekking	GSP0002N-GSP0002N	FEMORAL COMPONENT CR	YES	
Trekking	GSP0004PN-GSP0104PN	CR PRESSFIT FEMORAL	NO	HA COATED
Trekking	GSP1001-GSP1105	FEMORAL COMPONENT PS	YES	
Trekking	GSP1001P-GSP1105P	PS PRESSFIT FEMORAL	NO	HA COATED
Trekking	GSP1004N-GSP1103N	FEMORAL COMPONENT PS	YES	
Tibial				
Trekking	GSP7011-GSP7015	COCRMO MBHOLLOW TIBIAL TRAY	YES	
Trekking	GSP7011P-GSP7015P	COCRMO PRESSFIT TIBIAL	NO	
Trekking	GSP7011PN-GSP7014PN	TIBIAL TRAY MB HOLLOW COCRMO PRESSFIT	NO	
Trekking	GSP7013N-GSP7014N	COCRMO MBHOLLOW TIBIAL TRAY	YES	
Trekking	GSP7041-GSP7045	FB TIBIAL TRAY COCRMO	YES	
Trekking	GSP7041P-GSP7045P	COCRMO PRESSFIT FB TIBIAL	NO	
Trekking	GSP7042N-GSP7043N	FB TIBIAL TRAY COCRMO	YES	

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

Femoral Range	Tibial Range	N Revised	N Total
GSP0001-GSP0105	GSP7011-GSP7015	5	50
	GSP7013N-GSP7014N	0	1
	GSP7041-GSP7045	1	59
GSP0001P-GSP0105P	GSP7011-GSP7015	5	102
	GSP7011P-GSP7015P	10	210
	GSP7011PN-GSP7014PN	1	8
	GSP7041-GSP7045	10	393
	GSP7042N-GSP7043N	0	1
GSP0002N-GSP0002N	GSP7042N-GSP7043N	0	1
GSP0004PN-GSP0104PN	GSP7011-GSP7015	0	1
	GSP7011P-GSP7015P	0	4
	GSP7041-GSP7045	0	2
GSP1001-GSP1105	GSP7011-GSP7015	16	237
	GSP7011P-GSP7015P	1	6
	GSP7013N-GSP7014N	0	3
	GSP7041-GSP7045	2	35
	GSP7041P-GSP7045P	0	1
GSP1001P-GSP1105P	GSP7011-GSP7015	4	31
	GSP7011P-GSP7015P	10	95
	GSP7011PN-GSP7014PN	0	1
	GSP7041-GSP7045	0	17
	GSP7041P-GSP7045P	0	1
GSP1004N-GSP1103N	GSP7011-GSP7015	0	3
	GSP7041-GSP7045	0	1
TOTAL		65	1263