

Australian Orthopaedic Association National Joint Replacement Registry

Primary Patella/Trochlea
Partial Knee Replacement
Supplementary Report 2022



AOA
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ASSOCIATION

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**Australian Orthopaedic Association
National Joint Replacement Registry**

**2022 Primary Patella/Trochlea Partial
Knee Arthroplasty
Supplementary Report**

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The Registry greatly appreciates the participation of all joint replacement patients throughout Australia. Their contribution allows ongoing improvements in arthroplasty outcomes to be achieved.

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Primary Patella/Trochlea Partial Knee Replacement

Introduction

This supplementary report provides a brief overview of partial knee replacement followed by detailed information on patella/trochlea partial knee replacement. Summary information on unicompartmental knee replacement is available in the 2022 AOANJRR Annual Report.

Primary knee replacement is an initial replacement procedure for the knee. Partial replacement involves replacement of a portion of the knee surface. This can vary from a small area, such as a partial resurfacing procedure, to replacement of an entire compartment of the knee, such as the patella/trochlea region.

CLASSES OF PARTIAL KNEE REPLACEMENT

The Registry subcategorises partial knee replacement into five classes. These are defined by the types of prostheses used.

Partial resurfacing involves the use of one or more button prostheses to replace part of the natural articulating surface on one or more sides of the joint, in one or more articular compartments of the knee.

Unispacer involves the use of a medial or lateral femorotibial compartment articular spacer.

Bicompartmental involves the replacement of the medial femoral and trochlear articular surface of the knee with a single femoral prosthesis, as well as the medial tibial articular surface with a unicompartmental tibial prosthesis. It may also include the use of a patellar prosthesis.

Patella/trochlea involves the use of a trochlear prosthesis to replace the femoral trochlear articular surface and, on most occasions, a patellar prosthesis.

Unicompartmental involves the replacement of the femoral and tibial articular surface of either the medial or lateral femorotibial compartment using unicompartmental femoral and tibial prostheses.

Detailed information on the demographics of each class of primary partial knee replacement is available in the supplementary report 'Demographics of Hip, Knee & Shoulder Arthroplasty' on the AOANJRR website:
<https://aoanjrr.sahmri.com/annual-reports-2022>

Detailed information on unicompartmental knee replacements can be found in the 'Hip, Knee & Shoulder Arthroplasty Annual Report' on the AOANJRR website:
<https://aoanjrr.sahmri.com/annual-reports-2022>

USE OF PARTIAL KNEE REPLACEMENT

Unicompartmental knee replacement remains the most common class of primary partial knee replacement, accounting for 92.7% of all partial knee replacement procedures. The second most common class is patella/trochlea replacement (6.6%). Within the remaining three classes (partial resurfacing, unispacer, and bicompartmental knee replacement), only small numbers of procedures have been reported (Table SPK1).

Table SPK1 Partial Knee Replacement by Class

Partial Knee Class	Number	Percent
Partial Resurfacing	245	0.3
Unispacer	40	0.1
Bicompartmental	165	0.2
Patella/Trochlea	4827	6.6
Unicompartmental	67497	92.7
TOTAL	72774	100.0

The unispacer procedure has not been used since 2005 and has the highest revision rate of any class of partial knee replacement. Bicompartmental knee replacement has not been used since 2012. Partial resurfacing procedures have not been used since 2018. These classes of partial knee replacement are not presented in detail in this report.

Detailed information on unispacer, bicompartmental and partial resurfacing knee replacement is available in the supplementary report 'Prosthesis Types with No and Minimal Use' on the AOANJRR website: <https://aoanjrr.sahmri.com/annual-reports-2022>

Osteoarthritis is the principal diagnosis for the five classes of partial knee replacement (99.0%). There is considerable variation in the outcome of primary partial knee replacement depending on the class (Table SPK2).

Table SPK2 Cumulative Percent Revision of Primary Partial Knee Replacement by Class

Partial Knee Class	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	15 Yrs	20 Yrs
Partial Resurfacing	110	245	6.1 (3.7, 10.0)	17.1 (13.0, 22.5)	25.9 (20.8, 31.9)	39.7 (33.6, 46.5)		
Unispacer	35	40	42.5 (29.0, 59.2)	67.5 (53.0, 81.2)	67.5 (53.0, 81.2)	77.5 (63.7, 88.8)	82.5 (69.4, 92.3)	
Bicompartmental	31	165	6.1 (3.3, 11.0)	11.7 (7.6, 17.7)	14.2 (9.7, 20.6)	16.2 (11.3, 22.9)		
Patella/Trochlea	1067	4827	2.1 (1.7, 2.5)	7.9 (7.2, 8.8)	13.3 (12.2, 14.4)	26.9 (25.3, 28.6)	42.7 (40.2, 45.3)	
Unicompartmental	9165	67497	2.1 (2.0, 2.2)	5.2 (5.1, 5.4)	7.4 (7.2, 7.6)	13.8 (13.5, 14.1)	21.4 (21.0, 21.9)	29.6 (28.7, 30.5)
TOTAL	10408	72774						

PATELLA/TROCHLEA

DEMOGRAPHICS

There have been 4,827 patella/trochlea knee replacements reported to the Registry. This is an additional 298 procedures compared to the previous report.

The principal diagnosis for patella/trochlea procedures is osteoarthritis (98.8%). This procedure is most frequently undertaken in females (77.0%) (Figure SPK1). The mean age of patients is 58.4 years (Table SPK3 and Figure SPK2).

Figure SPK1 Primary Patella/Trochlea Knee Replacement by Gender

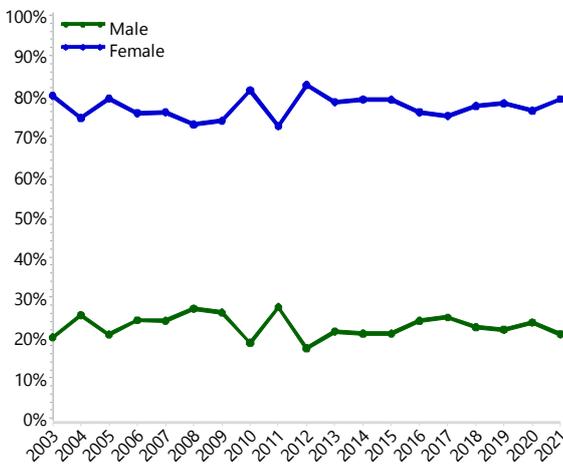
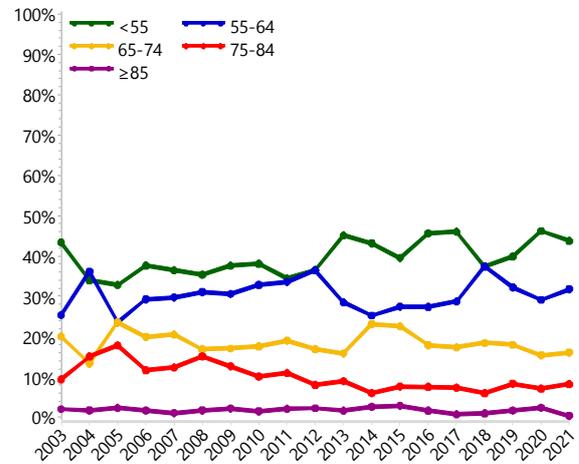


Figure SPK2 Primary Patella/Trochlea Knee Replacement by Age



In 2021, the 5 most common resurfacing trochlear prostheses are the Gender Solutions, Restoris MCK, Journey, Avon, and RBK. The Gender Solutions prosthesis was first reported in 2009 and since 2010 it has remained the most frequently used prosthesis in this class (Table SPK4).

The outcomes of patella/trochlear prosthesis combinations with more than 20 procedures are presented in Table SPK5.

Table SPK3 Age and Gender of Primary Patella/Trochlea Knee Replacement

Gender	Number	Percent	Minimum	Maximum	Median	Mean	Std Dev
Male	1108	23.0%	24	95	60	60.8	13.0
Female	3719	77.0%	22	95	57	57.7	11.8
TOTAL	4827	100.0%	22	95	57	58.4	12.1

Table SPK4 Most Used Resurfacing Trochlea Prostheses in Primary Patella/Trochlea Knee Replacement

2003		2018		2019		2020		2021	
N	Model	N	Model	N	Model	N	Model	N	Model
56	LCS	159	Gender Solutions	140	Gender Solutions	168	Gender Solutions	156	Gender Solutions
43	Avon	88	Restoris MCK	90	Restoris MCK	77	Restoris MCK	90	Restoris MCK
29	Lubinus	49	Journey	47	Journey	40	Journey	37	Journey
13	Themis	24	RBK	20	RBK	10	RBK	7	Avon
8	MOD III	17	Avon	4	Avon	4	Avon	3	RBK
1	RBK								
Most Used									
150	(6) 100.0%	337	(5) 100.0%	301	(5) 100.0%	299	(5) 100.0%	293	(5) 100.0%

Table SPK5 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Prosthesis Combination

Resurfacing Trochlear	Patella	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Avon	Avon	99	394	1.0 (0.4, 2.7)	6.8 (4.7, 9.8)	12.2 (9.3, 16.0)	23.4 (19.1, 28.5)	33.3 (27.3, 40.1)	
	Kinemax Plus*	117	307	2.0 (0.9, 4.3)	4.9 (3.0, 8.0)	11.9 (8.7, 16.1)	23.9 (19.4, 29.2)	36.7 (31.1, 42.9)	47.9 (41.0, 55.3)
	Triathlon	6	98	0.0 (0.0, 0.0)	2.2 (0.5, 8.3)	4.5 (1.7, 11.5)			
Gender Solutions	Natural Knee Flex*	9	36	0.0 (0.0, 0.0)	14.2 (6.1, 30.8)	14.2 (6.1, 30.8)	20.8 (10.4, 38.8)		
	Nexgen	165	1396	1.4 (0.9, 2.2)	6.8 (5.5, 8.4)	10.4 (8.7, 12.4)	23.2 (19.5, 27.4)		
	Persona	3	86	1.4 (0.2, 9.2)	3.2 (0.8, 12.5)				
Journey	Genesis II	122	654	2.1 (1.2, 3.6)	7.3 (5.5, 9.8)	11.9 (9.4, 15.0)	25.0 (20.8, 29.7)		
LCS	LCS*	207	395	3.5 (2.1, 5.9)	11.7 (8.9, 15.3)	20.9 (17.2, 25.3)	40.6 (35.8, 45.8)	52.0 (46.8, 57.3)	
Lubinus	Duracon*	28	77	2.6 (0.7, 10.0)	9.2 (4.5, 18.4)	16.0 (9.4, 26.4)	25.3 (16.6, 37.2)	38.6 (27.6, 52.1)	
	Lubinus*	22	39	5.1 (1.3, 19.0)	18.1 (9.1, 34.3)	20.9 (11.0, 37.6)	35.0 (22.0, 52.7)	58.2 (42.1, 75.2)	62.9 (46.0, 79.6)
MOD III	MOD III*	26	62	4.8 (1.6, 14.3)	14.5 (7.8, 26.0)	17.8 (10.3, 29.8)	26.6 (17.2, 39.7)	37.4 (26.4, 51.2)	44.9 (32.5, 59.5)
RBK	RBK	141	549	2.9 (1.8, 4.7)	8.9 (6.8, 11.7)	14.8 (12.0, 18.1)	27.8 (23.7, 32.4)	38.0 (32.1, 44.6)	
Restoris MCK	Duracon	2	21	4.8 (0.7, 29.3)	4.8 (0.7, 29.3)				
	Restoris MCK	19	357	1.0 (0.3, 3.1)	5.8 (3.4, 9.7)				
	Triathlon	3	69	3.1 (0.8, 11.8)	6.8 (2.0, 21.9)				
Sigma HP	PFC Sigma*	41	117	4.3 (1.8, 10.0)	14.7 (9.4, 22.6)	21.1 (14.6, 29.8)			
Themis	Themis*	15	38	2.6 (0.4, 17.2)	2.6 (0.4, 17.2)	8.0 (2.6, 22.7)	18.8 (9.4, 35.4)	39.5 (25.5, 57.6)	
Vanguard	Series A*	11	41	4.9 (1.2, 18.1)	17.1 (8.5, 32.5)	24.4 (13.9, 40.6)	27.0 (15.9, 43.4)		
Other (29)		31	91	3.3 (1.1, 9.9)	11.6 (6.4, 20.5)	14.4 (8.4, 24.0)	34.3 (24.1, 47.3)	49.1 (36.2, 63.7)	
TOTAL		1067	4827						

Note: Only combinations with >20 procedures have been listed

* denotes prosthesis combination with no reported use in patella/trochlea knee replacement in 2021

OUTCOME FOR OSTEOARTHRITIS

The Registry has recorded 1,052 revisions of primary patella/trochlea knee replacement for osteoarthritis.

The most common reason for revision is progression of disease (55.5%), followed by loosening (14.4%) and pain (10.4%) (Table SPK6).

The main type of revision of a primary patella/trochlea knee replacement is to a total knee replacement (87.1%) (Table SPK7).

The cumulative percent revision of primary patella/trochlea knee replacement undertaken for osteoarthritis is 13.3% at 5 years and 50.3% at 18 years (Table SPK8 and Figure SPK3).

Age and gender are risk factors for revision. Patients aged <65 years have a higher rate of revision than patients aged ≥65 years (Table SPK9 and Figure SPK4).

Males have a higher rate of revision than females (Table SPK10 and Figure SPK5).

Table SPK6 Primary Patella/Trochlea Knee Replacement by Reason for Revision (Primary Diagnosis OA)

Reason for Revision	Number	Percent
Progression Of Disease	584	55.5
Loosening	151	14.4
Pain	109	10.4
Implant Breakage Patella	36	3.4
Wear Patella	35	3.3
Infection	29	2.8
Malalignment	19	1.8
Lysis	15	1.4
Wear Tibial Insert	5	0.5
Arthrofibrosis	2	0.2
Wear Femoral	1	0.1
Implant Breakage Femoral	1	0.1
Other	65	6.2
TOTAL	1052	100.0

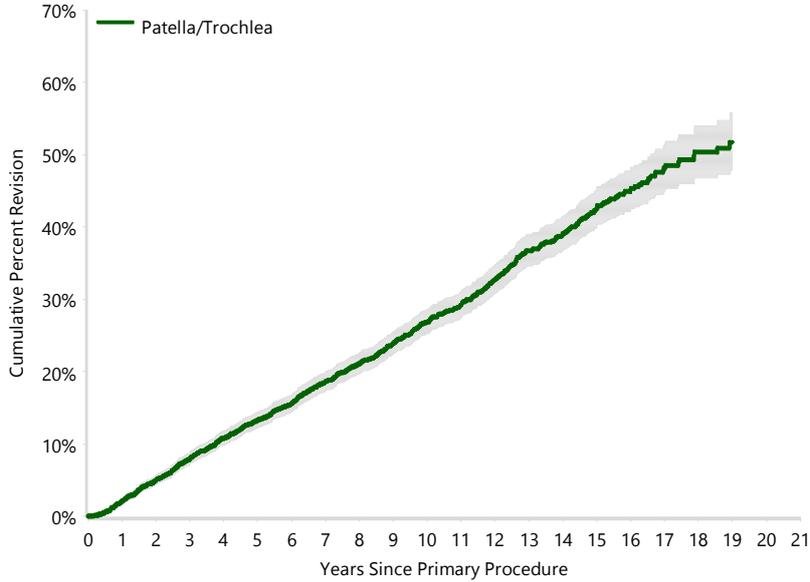
Table SPK7 Primary Patella/Trochlea Knee Replacement by Type of Revision (Primary Diagnosis OA)

Type of Revision	Number	Percent
TKR (Tibial/Femoral)	916	87.1
Patella Only	79	7.5
Patella/Trochlear Resurfacing	28	2.7
UKR (Uni Tibial/Uni Femoral)	16	1.5
Removal of Prostheses	6	0.6
Cement Spacer	4	0.4
Femoral Component	3	0.3
TOTAL	1052	100.0

Table SPK8 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement (Primary Diagnosis OA)

Knee Type	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Patella/Trochlea	1052	4772	2.1 (1.7, 2.5)	7.9 (7.2, 8.8)	13.3 (12.3, 14.4)	26.9 (25.2, 28.6)	39.1 (36.8, 41.5)	50.3 (46.8, 54.0)
TOTAL	1052	4772						

Figure SPK3 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement (Primary Diagnosis OA)

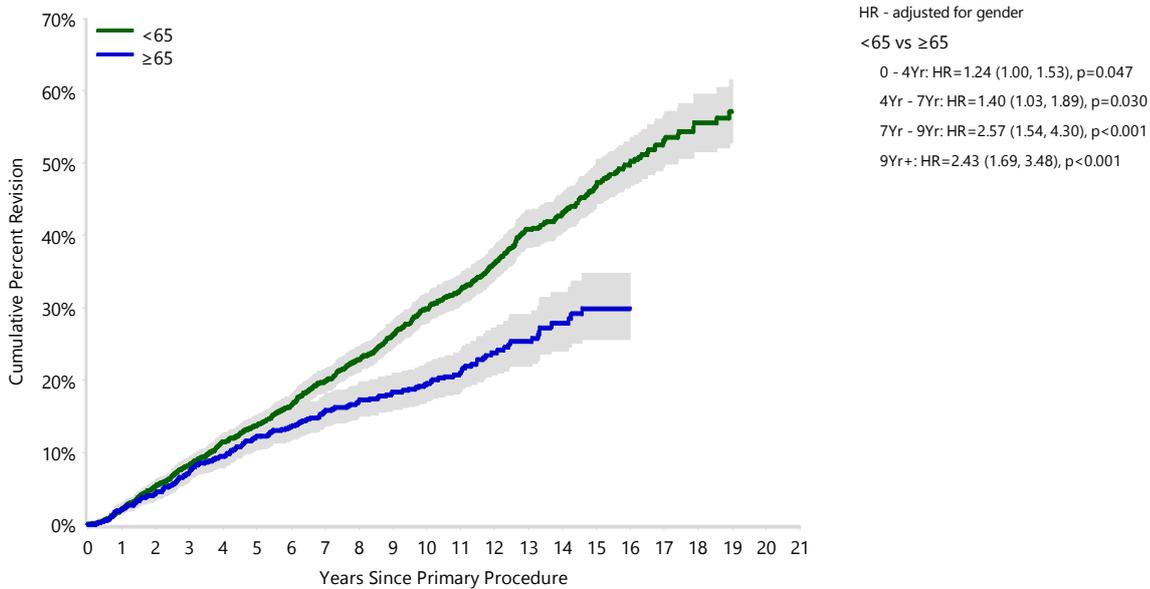


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Patella/Trochlea	4772	4375	3515	2721	1259	470	98

Table SPK9 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Age (Primary Diagnosis OA)

Age	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
<65	831	3365	2.1 (1.7, 2.7)	8.2 (7.3, 9.3)	13.8 (12.5, 15.1)	29.8 (27.8, 31.9)	43.1 (40.4, 45.9)	55.5 (51.6, 59.5)
≥65	221	1407	2.1 (1.4, 3.0)	7.2 (5.9, 8.8)	12.2 (10.4, 14.2)	19.3 (16.9, 22.1)	27.8 (24.0, 32.1)	
TOTAL	1052	4772						

Figure SPK4 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Age (Primary Diagnosis OA)

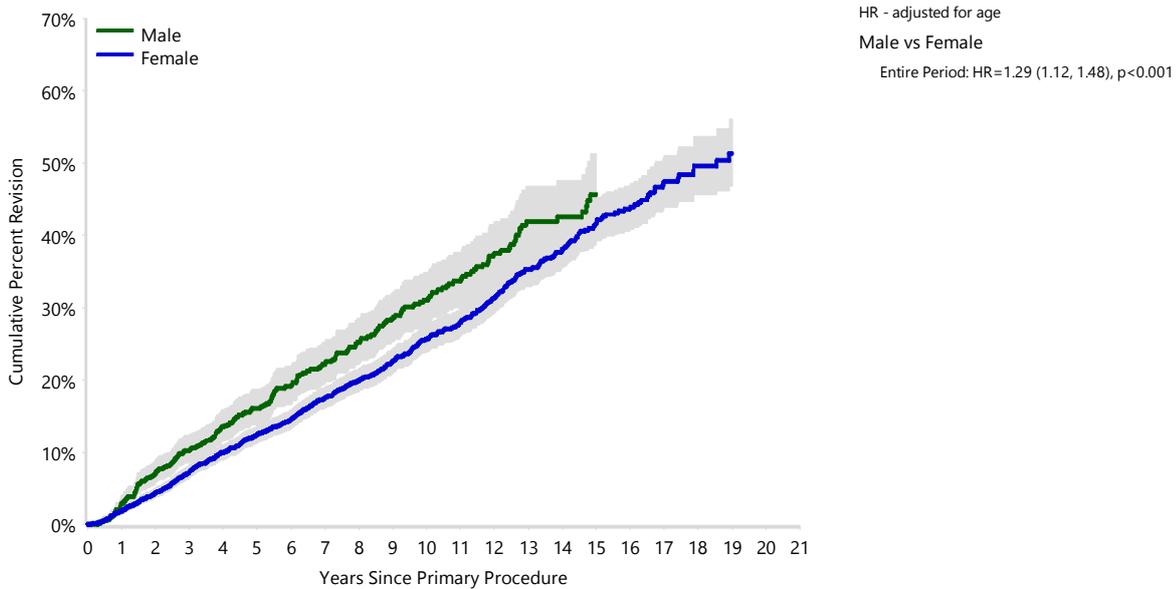


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
<65	3365	3077	2475	1908	887	350	76
≥65	1407	1298	1040	813	372	120	22

Table SPK10 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Gender (Primary Diagnosis OA)

Gender	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Male	270	1098	2.9 (2.1, 4.2)	10.2 (8.5, 12.3)	16.1 (13.9, 18.7)	31.1 (27.6, 34.9)	42.5 (37.8, 47.6)	
Female	782	3674	1.8 (1.4, 2.3)	7.2 (6.4, 8.2)	12.4 (11.3, 13.7)	25.6 (23.8, 27.5)	38.1 (35.5, 40.8)	49.6 (45.6, 53.7)
TOTAL	1052	4772						

Figure SPK5 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Gender (Primary Diagnosis OA)

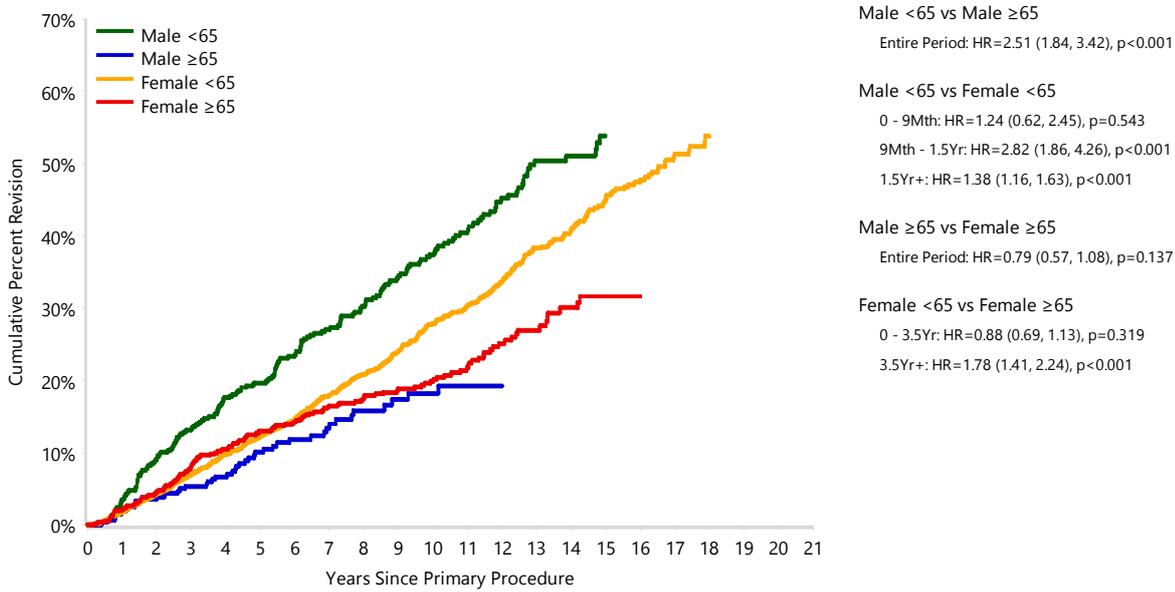


Number at Risk	0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Male	1098	1003	788	594	264	89	16
Female	3674	3372	2727	2127	995	381	82

Table SPK11 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Gender and Age (Primary Diagnosis OA)

Gender	Age	N Revised	N Total	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Male		270	1098	2.9 (2.1, 4.2)	10.2 (8.5, 12.3)	16.1 (13.9, 18.7)	31.1 (27.6, 34.9)	42.5 (37.8, 47.6)	
	<65	221	684	3.5 (2.4, 5.3)	13.2 (10.7, 16.1)	19.7 (16.7, 23.2)	37.5 (33.0, 42.3)	51.1 (45.5, 56.9)	
	≥65	49	414	2.0 (1.0, 4.0)	5.3 (3.5, 8.2)	10.1 (7.3, 14.0)	18.2 (13.7, 24.1)		
Female		782	3674	1.8 (1.4, 2.3)	7.2 (6.4, 8.2)	12.4 (11.3, 13.7)	25.6 (23.8, 27.5)	38.1 (35.5, 40.8)	49.6 (45.6, 53.7)
	<65	610	2681	1.7 (1.3, 2.3)	7.0 (6.0, 8.1)	12.2 (10.9, 13.7)	27.8 (25.6, 30.2)	41.0 (37.9, 44.2)	53.8 (49.3, 58.4)
	≥65	172	993	2.1 (1.3, 3.2)	8.0 (6.4, 9.9)	13.0 (10.9, 15.5)	19.9 (17.0, 23.1)	30.1 (25.6, 35.1)	
TOTAL		1052	4772						

Figure SPK6 Cumulative Percent Revision of Primary Patella/Trochlea Knee Replacement by Gender and Age (Primary Diagnosis OA)



Number at Risk		0 Yr	1 Yr	3 Yrs	5 Yrs	10 Yrs	14 Yrs	18 Yrs
Male	<65	684	620	487	370	178	65	12
	≥65	414	383	301	224	86	24	4
Female	<65	2681	2457	1988	1538	709	285	64
	≥65	993	915	739	589	286	96	18

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