

## Taper Fit Total Conventional Hip Investigation

Note: This analysis compares the Taper Fit femoral stem prosthesis with all other total conventional hip 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-2022>.

Note: Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator. Procedures using prostheses with no recorded use in 2021 are excluded from the comparator.

### TABLE 1

#### Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the Taper Fit total conventional hip prosthesis is compared to all other total conventional hip prostheses.

**Table 1: Revision Rates of Primary Total Conventional Hip Replacement**

Component	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Taper Fit	133	4181	13595	0.98 (0.82, 1.16)
Other Total Conventional Hip	15775	449567	2710726	0.58 (0.57, 0.59)
<b>TOTAL</b>	<b>15908</b>	<b>453748</b>	<b>2724321</b>	<b>0.58 (0.57, 0.59)</b>

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

TABLE 2

**Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement**

The yearly cumulative percent revision of the Taper Fit total conventional hip prosthesis is compared to all other total conventional hip prostheses.

**Table 2: Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement**

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs
Taper Fit	1.5 (1.2, 1.9)	2.0 (1.6, 2.5)	2.6 (2.1, 3.2)	3.2 (2.6, 4.0)	4.1 (3.2, 5.1)	4.8 (3.8, 6.0)	5.8 (4.5, 7.4)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.2, 2.2)	2.5 (2.5, 2.6)	2.8 (2.8, 2.9)	3.1 (3.0, 3.2)	3.4 (3.3, 3.5)	3.7 (3.6, 3.7)

CPR	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs
Taper Fit	6.4 (4.9, 8.2)	7.1 (5.4, 9.2)	8.8 (6.6, 11.7)	9.3 (7.0, 12.4)	9.3 (7.0, 12.4)	12.6 (9.3, 17.0)	13.3 (9.8, 17.9)
Other Total Conventional Hip	4.0 (3.9, 4.0)	4.3 (4.2, 4.4)	4.6 (4.6, 4.7)	5.0 (4.9, 5.1)	5.4 (5.3, 5.5)	5.8 (5.7, 5.9)	6.3 (6.1, 6.4)

CPR	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
Taper Fit	15.8 (11.6, 21.3)	18.0 (13.1, 24.4)	18.0 (13.1, 24.4)				
Other Total Conventional Hip	6.7 (6.5, 6.8)	7.1 (6.9, 7.3)	7.5 (7.3, 7.7)	7.9 (7.6, 8.1)	8.6 (8.3, 8.9)	8.9 (8.5, 9.3)	9.8 (9.0, 10.8)

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

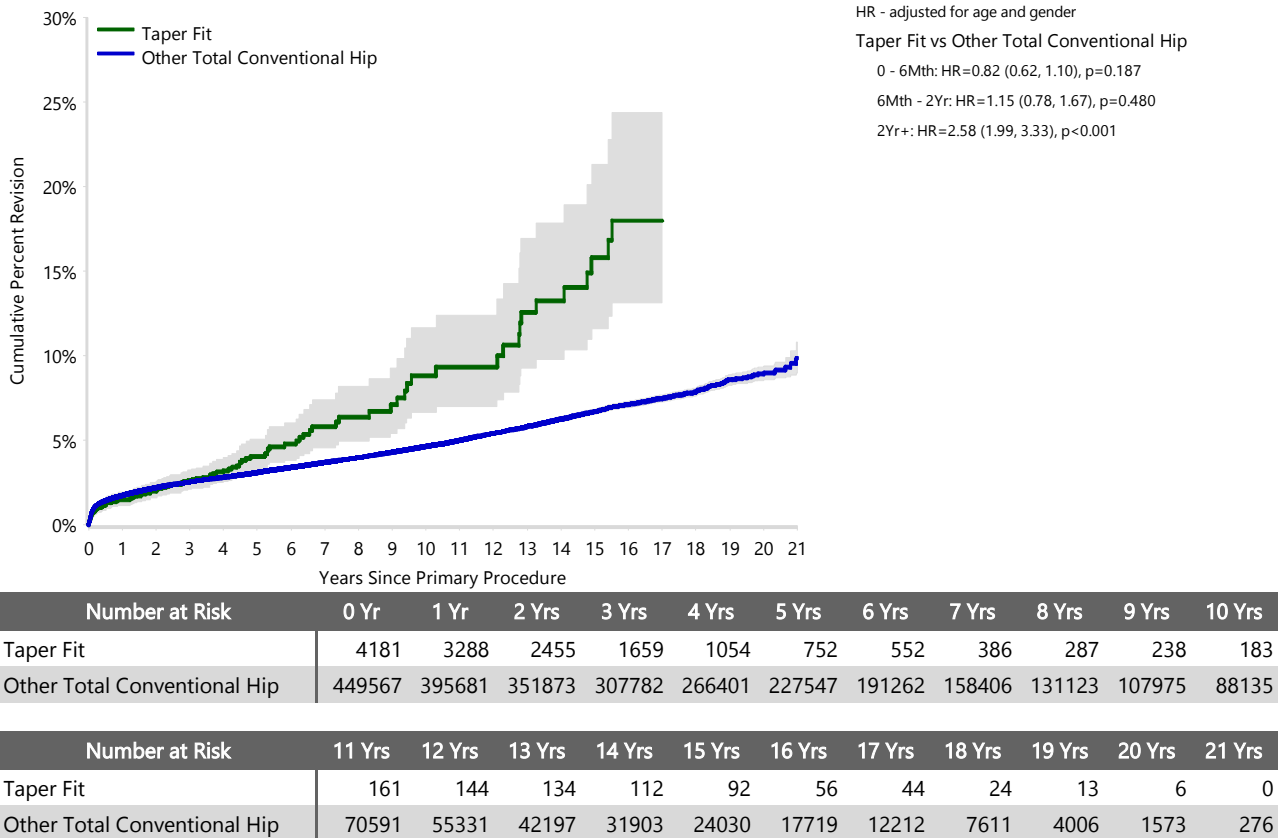
FIGURE 1

**Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement**

The yearly cumulative percent revision of the Taper Fit total conventional hip prosthesis is compared to all other total conventional hip 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 Conventional Hip Replacement**



Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

**TABLE 3****Primary Diagnosis for Revised Primary Total Conventional Hip 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 conventional hip prostheses.

**Table 3: Primary Diagnosis for Revised Primary Total Conventional Hip Replacement**

Primary Diagnosis	Taper Fit		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	107	80.5	13044	82.7
Fractured Neck Of Femur	7	5.3	1160	7.4
Osteonecrosis	9	6.8	713	4.5
Developmental Dysplasia			247	1.6
Rheumatoid Arthritis	2	1.5	171	1.1
Failed Internal Fixation			140	0.9
Tumour	4	3.0	134	0.8
Other Inflammatory Arthritis	2	1.5	90	0.6
Fracture/Dislocation	1	0.8	46	0.3
Arthrodesis Takedown			16	0.1
Other	1	0.8	14	0.1
<b>TOTAL</b>	<b>133</b>	<b>100.0</b>	<b>15775</b>	<b>100.0</b>

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm 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 Conventional Hip Replacement - Reason for Revision

Revision Diagnosis	Number	Taper Fit		Other Total Conventional Hip		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Prosthesis Dislocation/Instability	29	0.7	21.8	3691	0.8	23.4
Infection	30	0.7	22.6	3531	0.8	22.4
Fracture	30	0.7	22.6	3419	0.8	21.7
Loosening	25	0.6	18.8	3219	0.7	20.4
Pain	3	0.1	2.3	286	0.1	1.8
Leg Length Discrepancy				260	0.1	1.6
Malposition	1	0.0	0.8	225	0.1	1.4
Lysis				184	0.0	1.2
Implant Breakage Stem	7	0.2	5.3	151	0.0	1.0
Implant Breakage Acetabular Insert	1	0.0	0.8	113	0.0	0.7
Incorrect Sizing	1	0.0	0.8	95	0.0	0.6
Wear Acetabular Insert				91	0.0	0.6
Metal Related Pathology	1	0.0	0.8	70	0.0	0.4
Implant Breakage Acetabular				67	0.0	0.4
Wear Head				45	0.0	0.3
Tumour	1	0.0	0.8	36	0.0	0.2
Implant Breakage Head				30	0.0	0.2
Heterotopic Bone				23	0.0	0.1
Wear Acetabulum	2	0.0	1.5	9	0.0	0.1
Progression Of Disease				2	0.0	0.0
Osteonecrosis				1	0.0	0.0
Synovitis				1	0.0	0.0
Other	2	0.0	1.5	226	0.1	1.4
<b>N Revision</b>	<b>133</b>	<b>3.2</b>	<b>100.0</b>	<b>15775</b>	<b>3.5</b>	<b>100.0</b>
<b>N Primary</b>	<b>4181</b>			<b>449567</b>		

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

**FIGURE 2**

**Cumulative Incidence Revision Diagnosis of Primary Total Conventional Hip 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 Taper Fit total conventional hip prosthesis. A comparative graph is provided of the cumulative incidence for the same reasons for revisions for all other total conventional hip prostheses.

**Figure 2: Cumulative Incidence Revision Diagnosis for Primary Total Conventional Hip Replacement**

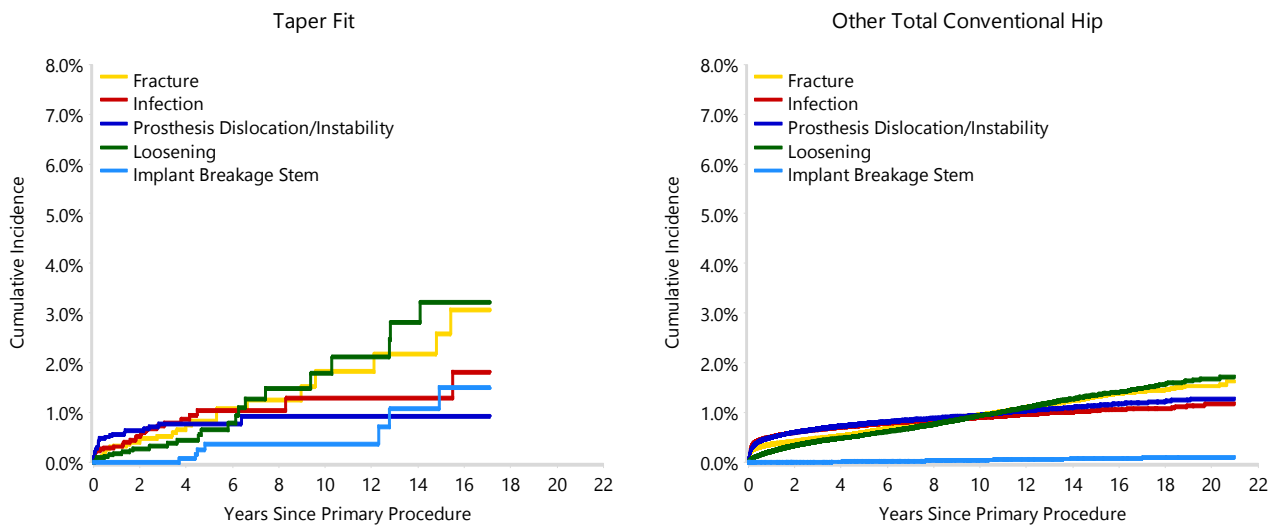


TABLE 5

**Type of Revision Performed for Primary Total Conventional Hip Replacement**

This analysis identifies the components used in the revision of the Taper Fit total conventional hip prosthesis and compares it to the components used in the revision of all other total conventional hip 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 conventional hip prostheses i.e. is there a difference in the type of revision undertaken for the Taper Fit total conventional hip prosthesis compared to all other total conventional hip prostheses.

**Table 5: Primary Total Conventional Hip Replacement - Type of Revision**

Type of Revision	Taper Fit		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	33	24.8	5132	32.5
Acetabular Component	30	22.6	3042	19.3
THR (Femoral/Acetabular)	30	22.6	1804	11.4
Cement Spacer	8	6.0	591	3.7
Removal of Prostheses	2	1.5	96	0.6
Reinsertion of Components			25	0.2
Total Femoral			6	0.0
Bipolar Head and Femoral			4	0.0
Saddle			1	0.0
<b>N Major</b>	<b>103</b>	<b>77.4</b>	<b>10701</b>	<b>67.8</b>
Head/Insert	23	17.3	3853	24.4
Head Only	3	2.3	775	4.9
Minor Components	3	2.3	271	1.7
Insert Only	1	0.8	171	1.1
Bipolar Only			2	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
<b>N Minor</b>	<b>30</b>	<b>22.6</b>	<b>5074</b>	<b>32.2</b>
<b>TOTAL</b>	<b>133</b>	<b>100.0</b>	<b>15775</b>	<b>100.0</b>

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

**TABLE 6****Revision Rates of Taper Fit Primary Total Conventional Hip 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 Taper Fit Primary Total Conventional Hip Replacement by Fixation**

Fixation	N Revised	N Total
Cemented	19	193
Cementless	0	2
Hybrid (Femur Cemented)	114	3986
<b>TOTAL</b>	<b>133</b>	<b>4181</b>

**TABLE 7****Revision Rates of Taper Fit Primary Total Conventional Hip 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 Taper Fit Primary Total Conventional Hip Replacement by Bearing Surface**

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	14	338
Ceramic/Non XLPE	0	27
Ceramic/XLPE	3	165
Ceramic/XLPE + Antioxidant	39	2129
Metal/Metal	32	167
Metal/Non XLPE	21	200
Metal/XLPE	0	40
Metal/XLPE + Antioxidant	24	1115
<b>TOTAL</b>	<b>133</b>	<b>4181</b>



**TABLE 8****Revision Rates of Taper Fit Primary Total Conventional Hip Replacement by Approach**

This analysis is provided as some prostheses are used with a variety of surgical approaches. All surgical approaches used with this prosthesis are listed.

**Table 8: Revised Number of Taper Fit Primary Total Conventional Hip Replacement by Approach**

Approach	N Revised	N Total
Anterior	8	684
Lateral	12	508
Posterior	53	2409
<b>TOTAL</b>	<b>73</b>	<b>3601</b>

Note: Excludes 580 procedures with no approach recorded

TABLE 9

**Revision Rates of Primary Total Conventional Hip Replacement by State**

This enables a state by state variation to be identified for the Taper Fit total conventional hip prosthesis and provides the comparative data for each of the states for all other total conventional hip 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 9: Revised Number of Primary Total Conventional Hip Replacement by State**

Component	State	N Revised	N Total
Taper Fit	NSW	83	2433
	VIC	13	510
	QLD	25	601
	WA	1	128
	SA	2	50
	TAS	0	39
	ACT/NT	9	420
Other Total Conventional Hip	NSW	4244	130736
	VIC	3974	116508
	QLD	3135	79588
	WA	2183	53824
	SA	1414	41885
	TAS	372	15059
	ACT/NT	453	11967
<b>TOTAL</b>		<b>15908</b>	<b>453748</b>

Note: Prostheses no longer used in 2021 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

**TABLE 10****Number of Revisions of Taper Fit Primary Total Conventional Hip Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the Taper Fit total conventional hip 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 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 10: Number of Revisions of Taper Fit Primary Total Conventional Hip Replacement by Year of Implant**

Year of Implant	Number Revised	Total Number
2001	2	14
2002	2	16
2003	6	34
2004	13	65
2005	15	50
2006	6	66
2007	1	26
2008	1	18
2009	1	6
2010	1	8
2011	2	17
2012	1	55
2013	1	45
2014	5	110
2015	5	161
2016	9	227
2017	9	315
2018	16	592
2019	18	790
2020	11	788
2021	8	778
<b>TOTAL</b>	<b>133</b>	<b>4181</b>

TABLE 11

**Revision Rates of Taper Fit Primary Total Conventional Hip 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 Taper Fit 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	Fixation
<b>Femoral Stem</b>					
Taper Fit	188001-188013	STAINLESS STEEL FEMORAL STEM W/CENTRALISER	YES	METAL	POLISHED
Taper Fit	5883600-5885004	STAINLESS STEEL FEMORAL STEM W/CENTRALISER	YES	METAL	POLISHED
Taper Fit	5883810-5884510	TAPERFIT CEMENT IN CEMENT REVISION STEM	YES	METAL	POLISHED
Taper Fit	E088000-E088014	EUROCONE STAINLESS STEEL FEMORAL STEM W/CENTRALISER	YES	METAL	POLISHED

**Table 11: Revised Number of Taper Fit Primary Total Conventional Hip Replacement by Catalogue Number Range**

Femoral Stem Range	N Revised	N Total
188001-188013	4	21
5883600-5885004	83	3868
5883810-5884510	0	1
E088000-E088014	46	291
<b>TOTAL</b>	<b>133</b>	<b>4181</b>

TABLE 12

## Revision Rates of Taper Fit Primary Total Conventional Hip 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 12: Revised Number of Taper Fit Primary Total Conventional Hip Replacement by Acetabular Component

Acetabular Component	N Revised	N Total
Acetabular Shell (Global)	0	1
Alpha Lock	2	31
Avantage	0	4
Cenator	5	37
Cera Fit	1	8
Contemporary	0	26
Continuum	0	1
Cormet	29	157
Cormet 2000	3	10
DC-Fit	0	1
Delta-One-TT	0	1
Dual Mobility Cup	2	39
Exeter X3 Rimfit	0	6
G7	0	7
Horizon	0	1
Mpact	0	1
Muller	1	7
No Acetabular	0	1
Novae	0	11
Novae E	0	18
PINNACLE	0	2
R3	0	1
RM Cup	0	2
Reflection (Cup)	7	30
Restoration	0	1
Saturne	3	31
Trident (Cup)	0	3
Trident (Shell)	0	11
Trident/Tritanium (Shell)	0	4
Trilogy	0	1
Trinity	79	3719
Trinity Plus	0	7
ZCA	1	1
<b>TOTAL</b>	<b>133</b>	<b>4181</b>