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-2025.

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 2024 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	223	7192	28111	0.79 (0.69, 0.90)
Other Total Conventional Hip	19327	545323	3528154	0.55 (0.54, 0.56)
TOTAL	**19550**	**552515**	**3556265**	**0.55 (0.54, 0.56)**

Note: Prostheses no longer used in 2024 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 (95% CI) of Primary Total Conventional Hip Replacement

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
Taper Fit	1.6 (1.4, 2.0)	2.1 (1.8, 2.5)	2.5 (2.1, 2.9)	2.8 (2.4, 3.3)	3.3 (2.8, 3.8)	3.9 (3.3, 4.5)	4.3 (3.6, 5.0)	4.8 (4.0, 5.7)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.1, 2.2)	2.5 (2.4, 2.5)	2.8 (2.7, 2.8)	3.0 (3.0, 3.1)	3.3 (3.3, 3.4)	3.6 (3.5, 3.6)	3.9 (3.8, 3.9)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Taper Fit	5.1 (4.2, 6.2)	6.3 (5.0, 8.0)	6.7 (5.3, 8.5)	6.7 (5.3, 8.5)	9.6 (7.1, 13.1)	10.3 (7.5, 14.0)	12.6 (9.1, 17.3)	14.2 (10.3, 19.5)
Other Total Conventional Hip	4.2 (4.1, 4.2)	4.4 (4.4, 4.5)	4.8 (4.7, 4.9)	5.2 (5.1, 5.3)	5.5 (5.4, 5.6)	5.9 (5.8, 6.0)	6.3 (6.2, 6.4)	6.7 (6.6, 6.9)

CPR	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
Taper Fit	16.1 (11.6, 22.0)	18.3 (13.2, 25.0)	18.3 (13.2, 25.0)				
Other Total Conventional Hip	7.1 (6.9, 7.2)	7.4 (7.3, 7.6)	7.9 (7.7, 8.1)	8.3 (8.0, 8.5)	8.8 (8.5, 9.1)	9.3 (9.0, 9.7)	9.9 (9.4, 10.5)

Note: Prostheses no longer used in 2024 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

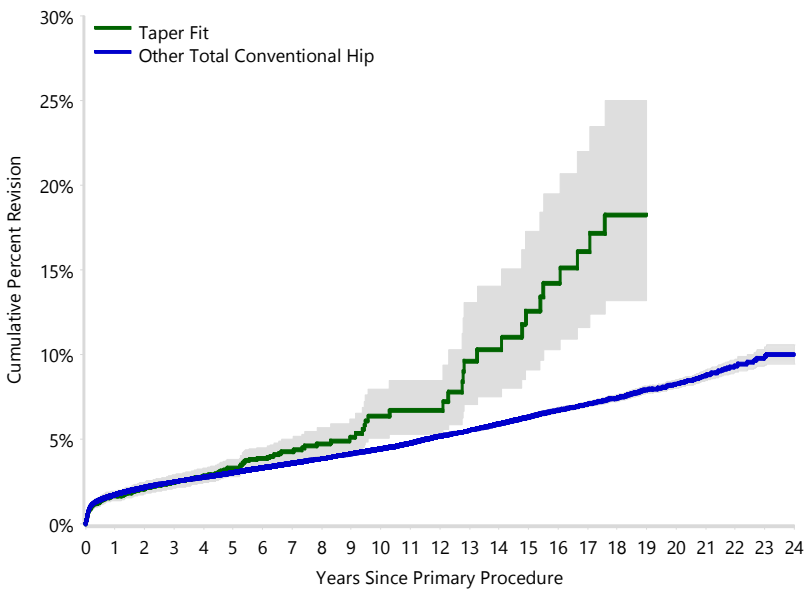
FIGURE 1

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



HR - adjusted for age and gender

Taper Fit vs Other Total Conventional Hip

0 - 6Mth: HR=0.95 (95% CI 0.77, 1.16), p=0.611

6Mth - 9Mth: HR=1.56 (95% CI 0.95, 2.56), p=0.078

9Mth - 1.5Yr: HR=0.82 (95% CI 0.51, 1.32), p=0.406

1.5Yr - 5.5Yr: HR=1.47 (95% CI 1.15, 1.89), p=0.002

5.5Yr+: HR=2.27 (95% CI 1.62, 3.17), p<0.001

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
Taper Fit	7192	6046	4759	3836	2988	2181	1455	909	635	459	309	224
Other Total Conventional Hip	545323	482014	428388	380690	334522	293905	253743	216436	181809	150113	122017	99318

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	23 Yrs
Taper Fit	180	142	126	110	98	78	68	45	31	18	11	5
Other Total Conventional Hip	80192	63993	49887	37933	28061	20580	15101	10871	7426	4536	2346	851

Note: Prostheses no longer used in 2024 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

	Taper Fit		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	176	78.9	16041	83.0
Fractured Neck Of Femur	20	9.0	1419	7.3
Osteonecrosis	14	6.3	846	4.4
Developmental Dysplasia			313	1.6
Rheumatoid Arthritis	3	1.3	207	1.1
Failed Internal Fixation			157	0.8
Tumour	6	2.7	148	0.8
Other Inflammatory Arthritis	2	0.9	111	0.6
Fracture/Dislocation	1	0.4	52	0.3
Other	1	0.4	19	0.1
Arthrodesis Takedown			14	0.1
TOTAL	**223**	**100.0**	**19327**	**100.0**

Note: Prostheses no longer used in 2024 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

	Taper Fit			Other Total Conventional Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	57	0.8	25.6	4725	0.9	24.4
Prosthesis Dislocation/Instability	56	0.8	25.1	4352	0.8	22.5
Fracture	45	0.6	20.2	4312	0.8	22.3
Loosening	43	0.6	19.3	3682	0.7	19.1
Pain	3	0.0	1.3	326	0.1	1.7
Leg Length Discrepancy				297	0.1	1.5
Malposition	3	0.0	1.3	266	0.0	1.4
Lysis	1	0.0	0.4	209	0.0	1.1
Implant Breakage Stem	7	0.1	3.1	201	0.0	1.0
Implant Breakage Acetabular Insert	1	0.0	0.4	126	0.0	0.7
Wear Acetabular Insert				109	0.0	0.6
Incorrect Sizing	1	0.0	0.4	98	0.0	0.5
Metal Related Pathology	1	0.0	0.4	92	0.0	0.5
Implant Breakage Acetabular				68	0.0	0.4
Wear Head				43	0.0	0.2
Tumour	1	0.0	0.4	39	0.0	0.2
Implant Breakage Head				31	0.0	0.2
Heterotopic Bone				27	0.0	0.1
Wear Acetabulum	2	0.0	0.9	10	0.0	0.1
Osteonecrosis				3	0.0	0.0
Synovitis				1	0.0	0.0
Other	2	0.0	0.9	310	0.1	1.6
N Revision	**223**	**3.1**	**100.0**	**19327**	**3.5**	**100.0**
N Primary	**7192**			**545323**		

Note: Prostheses no longer used in 2024 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

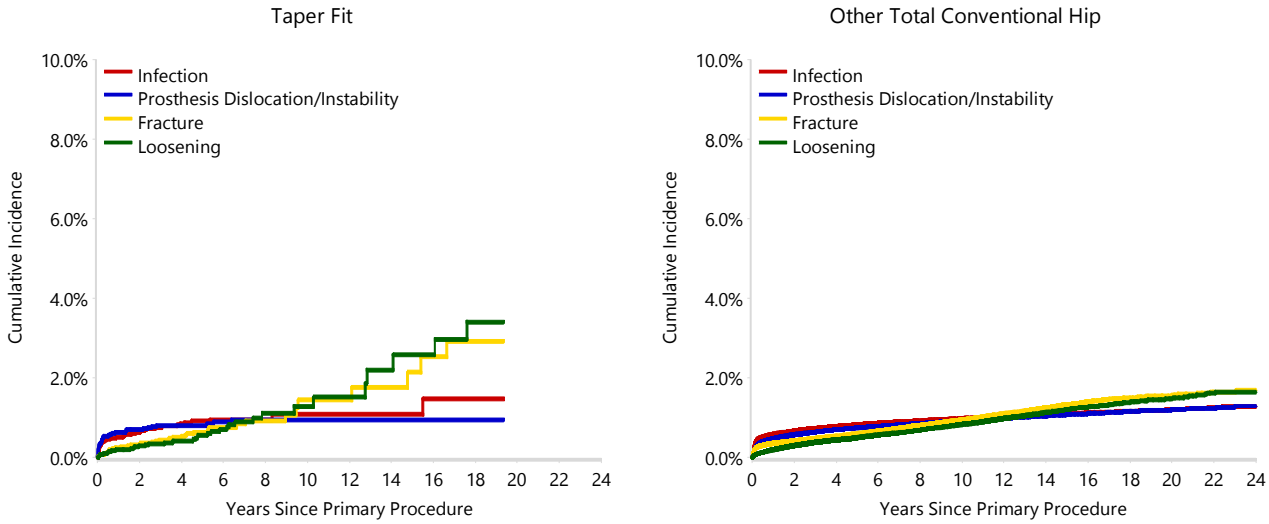


TABLE 5

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

	Taper Fit		Other Total Conventional Hip	
Type of Revision	Number	Percent	Number	Percent
Femoral Component	55	24.7	6518	33.7
Acetabular Component	46	20.6	3390	17.5
THR (Femoral/Acetabular)	46	20.6	2235	11.6
Cement Spacer	8	3.6	590	3.1
Removal of Prostheses	2	0.9	97	0.5
Reinsertion of Components			29	0.2
Total Femoral			13	0.1
Bipolar Head and Femoral			9	0.0
N Major	**157**	**70.4**	**12881**	**66.6**
Head/Insert	56	25.1	5045	26.1
Head Only	5	2.2	919	4.8
Minor Components	4	1.8	301	1.6
Insert Only	1	0.4	178	0.9
Bipolar Only			1	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	**66**	**29.6**	**6446**	**33.4**
TOTAL	**223**	**100.0**	**19327**	**100.0**

Note: Prostheses no longer used in 2024 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	25	235
Cementless	1	3
Hybrid (Femur Cemented)	197	6954
TOTAL	**223**	**7192**

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	16	395
Ceramic/Non XLPE	2	31
Ceramic/XLPE	4	190
Ceramic/XLPE + Antioxidant	96	4193
Metal/Metal	35	167
Metal/Non XLPE	25	208
Metal/XLPE	0	80
Metal/XLPE + Antioxidant	45	1928
TOTAL	**223**	**7192**

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	12	975
Lateral	23	763
Posterior	123	4870
TOTAL	**158**	**6608**

Note: Excludes 584 procedures with no approach recorded

TABLE 9

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 2024 has a maximum of one year to be revised, whereas a primary procedure performed in 2022 has a maximum of three years to be revised.

Table 9: 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	8	66
2007	3	26
2008	1	18
2009	1	6
2010	1	8
2011	2	17
2012	1	55
2013	1	45
2014	6	110
2015	5	161
2016	12	227
2017	11	315
2018	20	592
2019	27	790
2020	15	789
2021	16	798
2022	19	853
2023	20	1204
2024	16	933
TOTAL	**223**	**7192**

TABLE 10

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 10: Revised Number of Taper Fit Primary Total Conventional Hip Replacement by Acetabular Component

Acetabular Component	N Revised	N Total
Acetabular Shell (Global)	0	2
Alpha Lock	2	31
Avantage	0	7
BI-MENTUM	0	1
Cenator	5	37
Cera Fit	1	8
Contemporary	0	26
Continuum	0	3
Contour	0	1
Cormet	32	157
Cormet 2000	3	10
DC-Fit	0	1
Delta Revision TT	1	1
Delta-One-TT	0	2
Dual Mobility Cup	4	94
Exeter X3 Rimfit	0	7
G7	0	49
G7 Multihole	0	8
Generic Shell	0	1
Horizon	0	1
Marathon	0	1
Mpact	0	1
Muller	2	10
No Acetabular	0	1
Novae	0	14
Novae E	0	21
PINNACLE	0	4
R3	0	1
RM Cup	0	2
Reflection (Cup)	8	30
Restoration	0	1
Saturne	4	31
Trabecular Metal (Shell)	0	3
Trident (Cup)	0	3
Trident (Shell)	1	56
Trident II/Tritanium (Shell)	0	7
Trident/Tritanium (Shell)	0	4
Trilogy	0	1
Trinity	158	6488
Trinity Plus	1	64
ZCA	1	2
TOTAL	**223**	**7192**