Furlong Total Conventional Hip Investigation

Note: This analysis compares the Furlong acetabular 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-2023.

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 2022 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the Furlong 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)
Furlong	68	963	6539	1.04 (0.81, 1.32)
Other Total Conventional Hip	17415	493611	3078926	0.57 (0.56, 0.57)
TOTAL	**17483**	**494574**	**3085465**	**0.57 (0.56, 0.58)**

Note: Prostheses no longer used in 2022 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 Furlong 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	8 Yrs
Furlong	4.2 (3.1, 5.7)	5.4 (4.1, 7.0)	6.2 (4.9, 8.0)	6.4 (5.0, 8.2)	6.7 (5.2, 8.5)	6.7 (5.2, 8.5)	6.9 (5.4, 8.8)	7.3 (5.7, 9.3)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.1, 2.2)	2.5 (2.5, 2.6)	2.8 (2.7, 2.8)	3.1 (3.0, 3.1)	3.4 (3.3, 3.4)	3.6 (3.6, 3.7)	3.9 (3.9, 4.0)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs
Furlong	7.6 (5.9, 9.7)	7.6 (5.9, 9.7)	7.9 (6.2, 10.2)	7.9 (6.2, 10.2)	7.9 (6.2, 10.2)		
Other Total Conventional Hip	4.3 (4.2, 4.3)	4.6 (4.5, 4.7)	4.9 (4.8, 5.0)	5.3 (5.2, 5.4)	5.7 (5.6, 5.8)	6.1 (6.0, 6.2)	6.5 (6.4, 6.6)

CPR	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs
Furlong							
Other Total Conventional Hip	6.9 (6.8, 7.1)	7.3 (7.1, 7.4)	7.6 (7.4, 7.8)	8.2 (8.0, 8.5)	8.5 (8.2, 8.8)	8.9 (8.5, 9.3)	9.3 (8.8, 9.8)

Note: Prostheses no longer used in 2022 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

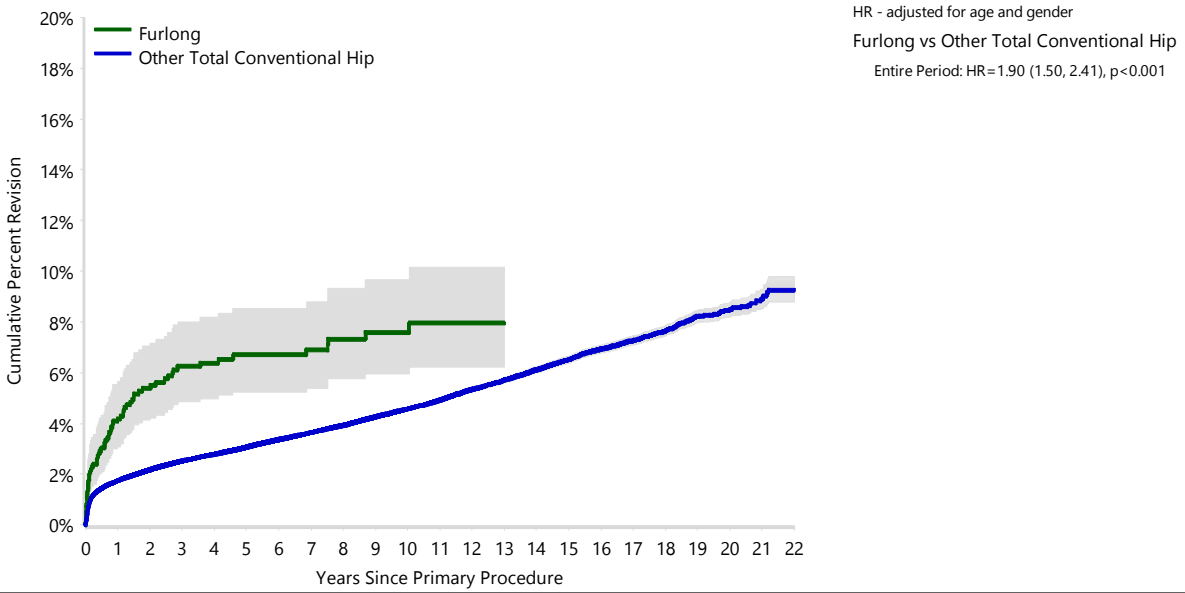
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the Furlong 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



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
Furlong	963	901	811	730	645	548	487	460	393	334	259	193
Other Total Conventional Hip	493611	437011	388306	343878	299392	257875	219167	183382	151265	124843	102584	83441

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
Furlong	127	62	24	22	17	16	14	13	9	5	2
Other Total Conventional Hip	66631	51982	39538	29740	22330	16535	11402	7013	3737	1435	252

Note: Prostheses no longer used in 2022 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

	Furlong		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	59	86.8	14397	82.7
Fractured Neck Of Femur	7	10.3	1291	7.4
Osteonecrosis	2	2.9	795	4.6
Developmental Dysplasia			279	1.6
Rheumatoid Arthritis			186	1.1
Failed Internal Fixation			147	0.8
Tumour			145	0.8
Other Inflammatory Arthritis			99	0.6
Fracture/Dislocation			46	0.3
Arthrodesis Takedown			16	0.1
Other			14	0.1
TOTAL	**68**	**100.0**	**17415**	**100.0**

Note: Prostheses no longer used in 2022 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

	Furlong			Other Total Conventional Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Prosthesis Dislocation/Instability	14	1.5	20.6	4020	0.8	23.1
Infection	13	1.3	19.1	3997	0.8	23.0
Fracture	12	1.2	17.6	3803	0.8	21.8
Loosening	18	1.9	26.5	3525	0.7	20.2
Pain				310	0.1	1.8
Leg Length Discrepancy	3	0.3	4.4	267	0.1	1.5
Malposition	3	0.3	4.4	242	0.0	1.4
Lysis				197	0.0	1.1
Implant Breakage Stem	1	0.1	1.5	168	0.0	1.0
Implant Breakage Acetabular Insert	1	0.1	1.5	120	0.0	0.7
Wear Acetabular Insert				102	0.0	0.6
Incorrect Sizing	1	0.1	1.5	101	0.0	0.6
Metal Related Pathology				79	0.0	0.5
Implant Breakage Acetabular				70	0.0	0.4
Wear Head				45	0.0	0.3
Tumour				41	0.0	0.2
Implant Breakage Head	2	0.2	2.9	32	0.0	0.2
Heterotopic Bone				26	0.0	0.1
Wear Acetabulum				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				257	0.1	1.5
N Revision	**68**	**7.1**	**100.0**	**17415**	**3.5**	**100.0**
N Primary	**963**			**493611**		

Note: Prostheses no longer used in 2022 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 Furlong 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

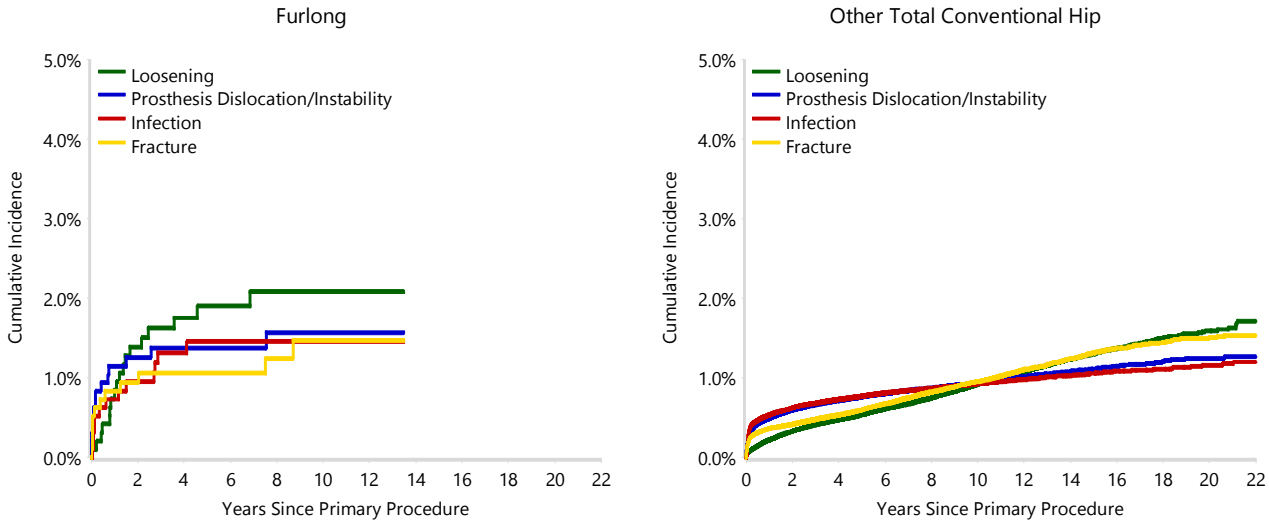


TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the Furlong 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 Furlong total conventional hip prosthesis compared to all other total conventional hip prostheses.

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

	Furlong		Other Total Conventional Hip	
Type of Revision	Number	Percent	Number	Percent
Femoral Component	21	30.9	5689	32.7
Acetabular Component	17	25.0	3309	19.0
THR (Femoral/Acetabular)	10	14.7	2023	11.6
Cement Spacer	4	5.9	615	3.5
Removal of Prostheses	1	1.5	95	0.5
Reinsertion of Components			27	0.2
Total Femoral			8	0.0
Bipolar Head and Femoral			5	0.0
Saddle			1	0.0
N Major	**53**	**77.9**	**11772**	**67.6**
Head/Insert	7	10.3	4320	24.8
Head Only	8	11.8	840	4.8
Minor Components			298	1.7
Insert Only			181	1.0
Bipolar Only			2	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	**15**	**22.1**	**5643**	**32.4**
TOTAL	**68**	**100.0**	**17415**	**100.0**

Note: Prostheses no longer used in 2022 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 Furlong 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 Furlong Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cementless	67	955
Hybrid (Femur Cemented)	1	8
TOTAL	**68**	**963**

TABLE 7

Revision Rates of Furlong 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 Furlong Primary Total Conventional Hip Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	37	582
Ceramic/Non XLPE	18	293
Metal/Non XLPE	13	88
TOTAL	**68**	**963**

TABLE 8

Revision Rates of Furlong 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 Furlong Primary Total Conventional Hip Replacement by Approach

Approach	N Revised	N Total
Anterior	20	255
Lateral	5	48
Posterior	8	157
TOTAL	**33**	**460**

Note: Excludes 503 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 Furlong 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
Furlong	NSW	5	61
	VIC	10	173
	QLD	24	393
	WA	20	229
	SA	2	8
	TAS	7	95
	ACT/NT	0	4
Other Total Conventional Hip	NSW	4726	144737
	VIC	4340	128178
	QLD	3444	86800
	WA	2369	58661
	SA	1621	45638
	TAS	405	16382
	ACT/NT	510	13215
TOTAL		**17483**	**494574**

Note: Prostheses no longer used in 2022 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 Furlong Primary Total Conventional Hip Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the Furlong 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 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 10: Number of Revisions of Furlong Primary Total Conventional Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2000	0	5
2001	1	7
2002	2	15
2003	1	4
2007	0	4
2008	1	7
2009	3	61
2010	6	90
2011	8	85
2012	4	73
2013	4	76
2014	5	64
2015	3	66
2016	0	12
2017	3	55
2018	13	100
2019	9	82
2020	2	65
2021	1	71
2022	2	21
TOTAL	**68**	**963**

TABLE 11

Revision Rates of Furlong 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 Furlong 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
Acetabular					
Furlong	1704607-1706607	H-A.C. CSF PLUS ACETABULAR CUP	NO	METAL	HA COATED
Furlong	1754607-1756807	H-A.C. CSF PLUS ACETABULAR CUP	NO	METAL	HA COATED
Furlong	855600-866207	JRI FURLONG H-AC CSF CUP	NO	METAL	HA COATED

Table 11: Revised Number of Furlong Primary Total Conventional Hip Replacement by Catalogue Number Range

Acetabular Range	N Revised	N Total
1704607-1706607	33	552
1754607-1756807	31	376
855600-866207	4	35
TOTAL	**68**	**963**

TABLE 12

Revision Rates of Furlong 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 Furlong Primary Total Conventional Hip Replacement by Femoral Stem Component

Femoral Stem Component	N Revised	N Total
ABGII	0	2
Anthology	0	2
CORAIL	2	6
Duofit	0	4
Exeter V40	0	1
Furlong	20	320
Furlong Evolution	33	437
GTH	1	6
HACTIV	1	11
Linear	2	15
MBA (exch neck)	0	10
MGS	0	1
MultiFit	0	5
Novation	9	132
Origin	0	7
S-Rom	0	1
Securus	0	2
Standard C	0	1
TOTAL	**68**	**963**