

## CPT/Fitmore Total Conventional Hip Investigation

Note: This analysis compares the CPT/Fitmore femoral stem/acetabular combination with all other total conventional hip 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-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 CPT/Fitmore total conventional hip combination 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)
CPT/Fitmore	21	290	1840	1.14 (0.71, 1.74)
Other Total Conventional Hip	17436	493889	3079906	0.57 (0.56, 0.57)
<b>TOTAL</b>	<b>17457</b>	<b>494179</b>	<b>3081746</b>	<b>0.57 (0.56, 0.57)</b>

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 CPT/Fitmore total conventional hip combination 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
CPT/Fitmore	4.2 (2.4, 7.2)	4.9 (2.9, 8.1)	6.1 (3.8, 9.6)	6.1 (3.8, 9.6)	6.7 (4.2, 10.4)	7.3 (4.7, 11.3)	7.3 (4.7, 11.3)	8.2 (5.2, 12.7)
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
CPT/Fitmore	8.2 (5.2, 12.7)	8.2 (5.2, 12.7)					
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
CPT/Fitmore							
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.

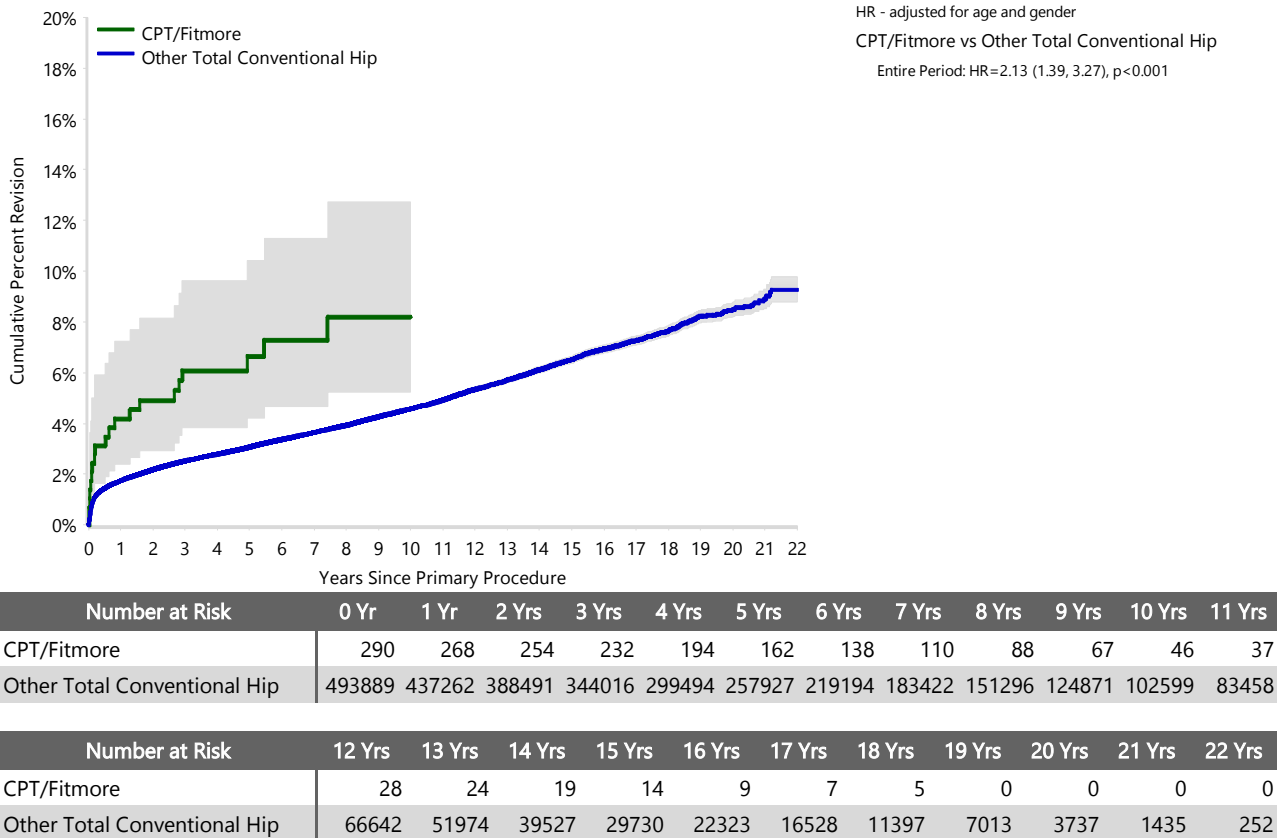
**FIGURE 1**

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

The yearly cumulative percent revision of the CPT/Fitmore total conventional hip combination 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 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**

Primary Diagnosis	CPT/Fitmore		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	11	52.4	14424	82.7
Fractured Neck Of Femur	8	38.1	1285	7.4
Osteonecrosis	1	4.8	796	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	1	4.8	98	0.6
Fracture/Dislocation			46	0.3
Arthrodesis Takedown			16	0.1
Other			14	0.1
<b>TOTAL</b>	<b>21</b>	<b>100.0</b>	<b>17436</b>	<b>100.0</b>

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 (Follow-up Limited to 18.5 Years)

Revision Diagnosis	Number	CPT/Fitmore		Other Total Conventional Hip		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Prosthesis Dislocation/Instability	1	0.3	4.8	4016	0.8	23.1
Infection	7	2.4	33.3	3996	0.8	23.0
Fracture	6	2.1	28.6	3798	0.8	21.9
Loosening	5	1.7	23.8	3514	0.7	20.2
Pain				309	0.1	1.8
Leg Length Discrepancy				270	0.1	1.6
Malposition				243	0.0	1.4
Lysis	1	0.3	4.8	192	0.0	1.1
Implant Breakage Stem	1	0.3	4.8	166	0.0	1.0
Implant Breakage Acetabular Insert				120	0.0	0.7
Incorrect Sizing				102	0.0	0.6
Wear Acetabular Insert				97	0.0	0.6
Metal Related Pathology				75	0.0	0.4
Implant Breakage Acetabular				69	0.0	0.4
Wear Head				45	0.0	0.3
Tumour				41	0.0	0.2
Implant Breakage Head				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
<b>N Revision</b>	<b>21</b>	<b>7.2</b>	<b>100.0</b>	<b>17381</b>	<b>3.5</b>	<b>100.0</b>
<b>N Primary</b>	<b>290</b>			<b>493889</b>		

Note: This table is restricted to revisions within 18.5 years for all groups to allow a time-matched comparison of revisions.

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 CPT/Fitmore total conventional hip combination. 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**

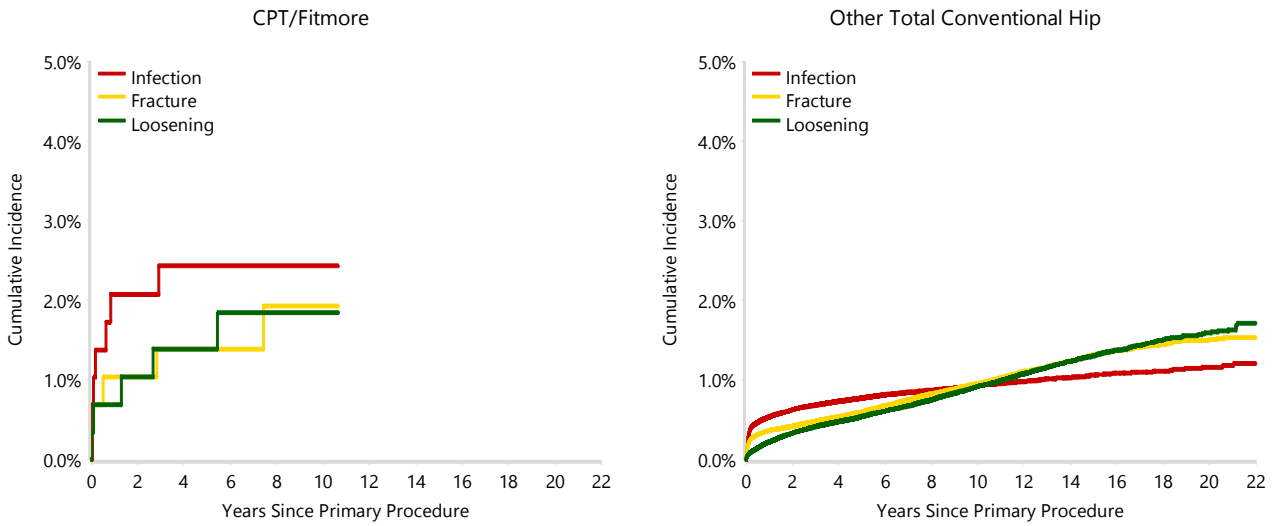


TABLE 5

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

This analysis identifies the components used in the revision of the CPT/Fitmore total conventional hip combination 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 CPT/Fitmore total conventional hip combination compared to all other total conventional hip prostheses.

**Table 5: Primary Total Conventional Hip Replacement - Type of Revision (Follow-up Limited to 18.5 Years)**

Type of Revision	CPT/Fitmore		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	10	47.6	5682	32.7
Acetabular Component			3299	19.0
THR (Femoral/Acetabular)	2	9.5	2017	11.6
Cement Spacer	3	14.3	617	3.5
Removal of Prostheses			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
<b>N Major</b>	<b>15</b>	<b>71.4</b>	<b>11751</b>	<b>67.6</b>
Head/Insert	5	23.8	4304	24.8
Head Only			844	4.9
Minor Components			298	1.7
Insert Only	1	4.8	180	1.0
Bipolar Only			2	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
<b>N Minor</b>	<b>6</b>	<b>28.6</b>	<b>5630</b>	<b>32.4</b>
<b>TOTAL</b>	<b>21</b>	<b>100.0</b>	<b>17381</b>	<b>100.0</b>

Note: This table is restricted to revisions within 18.5 years for all groups to allow a time-matched comparison of revisions.

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 CPT/Fitmore 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 CPT/Fitmore Primary Total Conventional Hip Replacement by Fixation**

Fixation	N Revised	N Total
Hybrid (Femur Cemented)	21	290
<b>TOTAL</b>	<b>21</b>	<b>290</b>

**TABLE 7****Revision Rates of CPT/Fitmore 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 combination are listed.

**Table 7: Revised Number of CPT/Fitmore Primary Total Conventional Hip Replacement by Bearing Surface**

Bearing Surface	N Revised	N Total
Ceramic/XLPE	4	50
Metal/Metal	4	32
Metal/XLPE	13	208
<b>TOTAL</b>	<b>21</b>	<b>290</b>



**TABLE 8****Revision Rates of CPT/Fitmore 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 combination are listed.

**Table 8: Revised Number of CPT/Fitmore Primary Total Conventional Hip Replacement by Approach**

Approach	N Revised	N Total
Anterior	0	2
Lateral	1	9
Posterior	4	98
<b>TOTAL</b>	<b>5</b>	<b>109</b>

Note: Excludes 181 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 CPT/Fitmore total conventional hip combination 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
CPT/Fitmore	NSW	21	274
	VIC	0	10
	WA	0	6
Other Total Conventional Hip	NSW	4712	144528
	VIC	4348	128314
	QLD	3451	86927
	WA	2389	58882
	SA	1621	45638
	TAS	405	16382
	ACT/NT	510	13218
<b>TOTAL</b>		<b>17457</b>	<b>494179</b>

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 CPT/Fitmore Primary Total Conventional Hip Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the CPT/Fitmore total conventional hip 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 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 CPT/Fitmore Primary Total Conventional Hip Replacement by Year of Implant**

Year of Implant	Number Revised	Total Number
2004	1	19
2005	0	6
2006	0	6
2007	0	4
2008	1	16
2009	5	12
2010	1	15
2011	1	24
2012	1	14
2013	1	30
2014	2	30
2015	3	22
2016	1	18
2017	0	16
2018	2	20
2019	1	25
2020	0	8
2021	0	1
2022	1	4
<b>TOTAL</b>	<b>21</b>	<b>290</b>

TABLE 11

**Revision Rates of CPT/Fitmore 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 CPT/Fitmore 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>					
CPT	00811400000-00811405000	ZIMALOY COCR POLISHED TAPERED STANDARD OFFSET FEMORAL STEM	YES	METAL	POLISHED
CPT	00811400010-00811400510	ZIMALOY COCR POLISHED TAPER EXTENDED OFFSET FEMORAL STEM	YES	METAL	POLISHED
CPT	00811400218-00811400218	ZIMALOY COCR POLISHED TAPER STANDARD OFFSET LONG FEMORAL STEM	YES	METAL	POLISHED
CPT	00811400230-00811400530	ZIMALOY COCR POLISHED TAPER EXTRA EXTENDED OFFSET FEMORAL STEM	YES	METAL	POLISHED
CPT	00811400318-00811400426	ZIMALOY COCR POLISHED TAPER EXTENDED OFFSET LONG FEMORAL STEM	YES	METAL	POLISHED
<b>Acetabular</b>					
Fitmore	0100024442-0100024464	TITANIUM SHELL W/FINS	NO	METAL	
Fitmore	0100024542-0100024568	TITANIUM SHELL W/SCREW CONES	NO	METAL	

**Table 11: Revised Number of CPT/Fitmore Primary Total Conventional Hip Replacement by Catalogue Number Range**

Femoral Stem Range	Acetabular Range	N Revised	N Total
00811400000-00811405000	0100024542-0100024568	10	176
00811400010-00811400510	0100024442-0100024464	0	6
	0100024542-0100024568	9	95
00811400218-00811400218	0100024542-0100024568	0	3
00811400230-00811400530	0100024542-0100024568	2	7
00811400318-00811400426	0100024542-0100024568	0	3
<b>TOTAL</b>		<b>21</b>	<b>290</b>