

## G7 Multihole Total Conventional Hip Investigation

Note: This analysis compares the G7 Multihole 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-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 G7 Multihole 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)
G7 Multihole	42	686	987	4.26 (3.07, 5.75)
Other Total Conventional Hip	15819	452774	2720160	0.58 (0.57, 0.59)
<b>TOTAL</b>	<b>15861</b>	<b>453460</b>	<b>2721147</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 G7 Multihole 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
G7 Multihole	6.1 (4.5, 8.2)	6.4 (4.7, 8.6)	8.2 (5.4, 12.2)				
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.1, 2.2)	2.5 (2.5, 2.6)	2.8 (2.8, 2.9)	3.1 (3.0, 3.2)	3.4 (3.3, 3.4)	3.7 (3.6, 3.7)

CPR	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs
G7 Multihole							
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)	6.2 (6.1, 6.4)

CPR	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
G7 Multihole							
Other Total Conventional Hip	6.7 (6.5, 6.8)	7.1 (6.9, 7.3)	7.5 (7.3, 7.7)	7.8 (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.

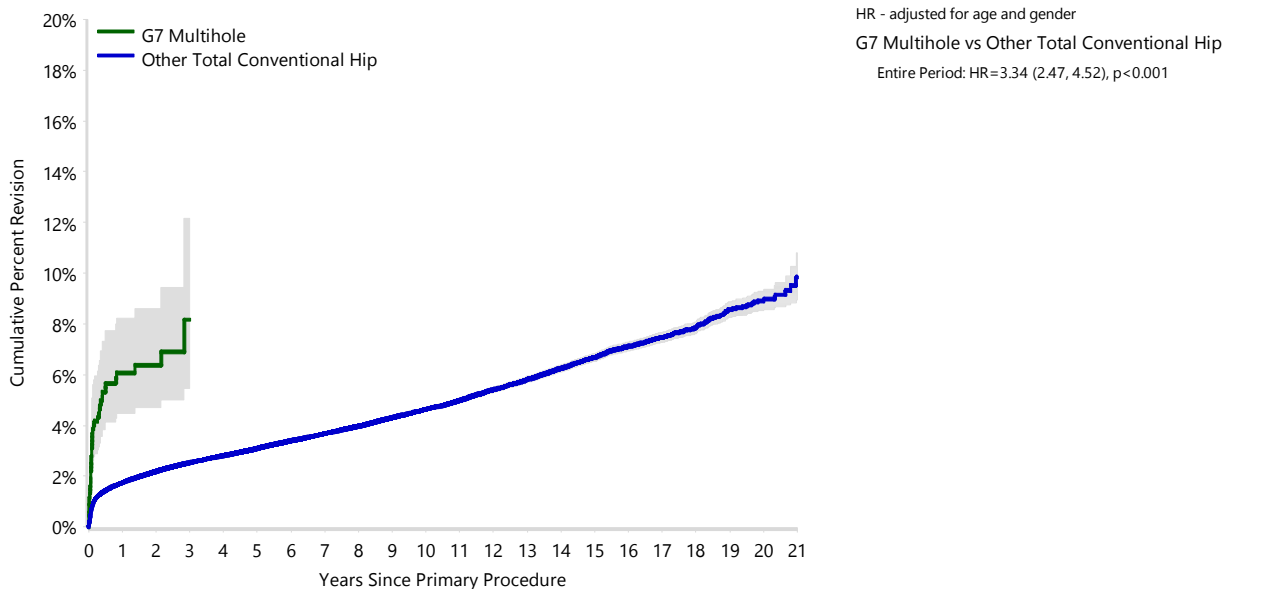
FIGURE 1

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

The yearly cumulative percent revision of the G7 Multihole 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
G7 Multihole	686	411	200	48	10	0	0	0	0	0	0
Other Total Conventional Hip	452774	398276	353855	309130	267195	228060	191587	158583	131210	108026	88155

Number at Risk	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs
G7 Multihole	0	0	0	0	0	0	0	0	0	0	0
Other Total Conventional Hip	70603	55343	42208	31909	24032	17719	12212	7611	4006	1573	276

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	G7 Multihole		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	17	40.5	13095	82.8
Fractured Neck Of Femur	9	21.4	1157	7.3
Osteonecrosis	2	4.8	716	4.5
Developmental Dysplasia	4	9.5	243	1.5
Rheumatoid Arthritis	1	2.4	172	1.1
Tumour	1	2.4	136	0.9
Failed Internal Fixation	5	11.9	135	0.9
Other Inflammatory Arthritis			91	0.6
Fracture/Dislocation	3	7.1	44	0.3
Arthrodesis Takedown			16	0.1
Other			14	0.1
<b>TOTAL</b>	<b>42</b>	<b>100.0</b>	<b>15819</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 (Follow-up Limited to 4.4 Years)

Revision Diagnosis	Number	G7 Multihole		Other Total Conventional Hip		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Prosthesis Dislocation/Instability	16	2.3	38.1	3104	0.7	26.5
Infection	14	2.0	33.3	3052	0.7	26.1
Fracture	7	1.0	16.7	2311	0.5	19.8
Loosening	2	0.3	4.8	1995	0.4	17.1
Leg Length Discrepancy				247	0.1	2.1
Pain				216	0.0	1.8
Malposition	2	0.3	4.8	184	0.0	1.6
Incorrect Sizing				87	0.0	0.7
Implant Breakage Acetabular Insert				75	0.0	0.6
Implant Breakage Stem	1	0.1	2.4	59	0.0	0.5
Implant Breakage Acetabular				40	0.0	0.3
Lysis				40	0.0	0.3
Tumour				30	0.0	0.3
Metal Related Pathology				24	0.0	0.2
Heterotopic Bone				19	0.0	0.2
Wear Head				17	0.0	0.1
Wear Acetabular Insert				13	0.0	0.1
Implant Breakage Head				11	0.0	0.1
Progression Of Disease				2	0.0	0.0
Wear Acetabulum				2	0.0	0.0
Osteonecrosis				1	0.0	0.0
Other				171	0.0	1.5
<b>N Revision</b>	<b>42</b>	<b>6.1</b>	<b>100.0</b>	<b>11700</b>	<b>2.6</b>	<b>100.0</b>
<b>N Primary</b>	<b>686</b>			<b>452774</b>		

Note: This table is restricted to revisions within 4.4 years for all groups to allow a time-matched comparison of revisions.

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 G7 Multihole 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**

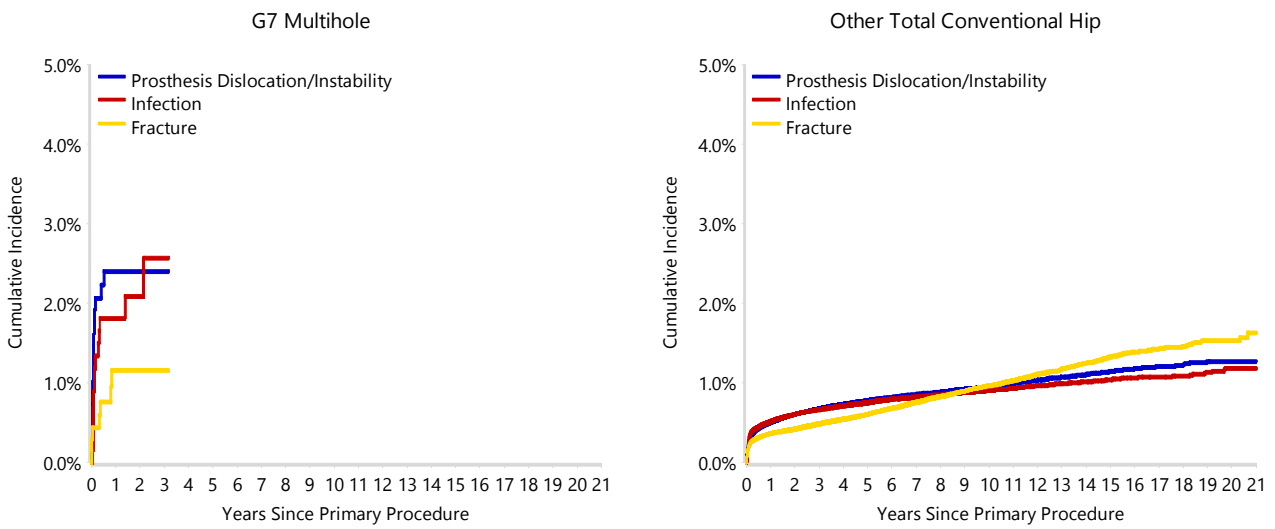


TABLE 5

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

This analysis identifies the components used in the revision of the G7 Multihole 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 G7 Multihole total conventional hip prosthesis compared to all other total conventional hip prostheses.

**Table 5: Primary Total Conventional Hip Replacement - Type of Revision (Follow-up Limited to 4.4 Years)**

Type of Revision	G7 Multihole		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	7	16.7	3483	29.8
Acetabular Component	7	16.7	2211	18.9
THR (Femoral/Acetabular)	5	11.9	1179	10.1
Cement Spacer	1	2.4	465	4.0
Removal of Prostheses			85	0.7
Reinsertion of Components			24	0.2
Bipolar Head and Femoral			4	0.0
Total Femoral			4	0.0
Saddle			1	0.0
<b>N Major</b>	<b>20</b>	<b>47.6</b>	<b>7456</b>	<b>63.7</b>
Head/Insert	20	47.6	3182	27.2
Head Only			709	6.1
Minor Components			191	1.6
Insert Only	2	4.8	158	1.4
Bipolar Only			2	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
<b>N Minor</b>	<b>22</b>	<b>52.4</b>	<b>4244</b>	<b>36.3</b>
<b>TOTAL</b>	<b>42</b>	<b>100.0</b>	<b>11700</b>	<b>100.0</b>

Note: This table is restricted to revisions within 4.4 years for all groups to allow a time-matched comparison of revisions.

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 G7 Multihole 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 G7 Multihole Primary Total Conventional Hip Replacement by Fixation**

Fixation	N Revised	N Total
Cemented	0	5
Cementless	23	417
Hybrid (Femur Cemented)	19	250
Reverse Hybrid (Femur Cementless)	0	14
<b>TOTAL</b>	<b>42</b>	<b>686</b>

**TABLE 7****Revision Rates of G7 Multihole 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 G7 Multihole Primary Total Conventional Hip Replacement by Bearing Surface**

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	0	4
Ceramic/XLPE + Antioxidant	14	251
Metal/XLPE + Antioxidant	28	425
Ceramicised Metal/XLPE + Antioxidant	0	5
Unknown	0	1
<b>TOTAL</b>	<b>42</b>	<b>686</b>



**TABLE 8****Revision Rates of G7 Multihole 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 G7 Multihole Primary Total Conventional Hip Replacement by Approach**

Approach	N Revised	N Total
Anterior	4	77
Lateral	8	98
Posterior	30	508
<b>TOTAL</b>	<b>42</b>	<b>683</b>

Note: Excludes 3 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 G7 Multihole 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
G7 Multihole	NSW	7	111
	VIC	7	146
	QLD	4	95
	WA	16	263
	SA	7	56
	TAS	0	5
	ACT/NT	1	10
Other Total Conventional Hip	NSW	4291	132858
	VIC	3975	116852
	QLD	3142	80028
	WA	2168	53690
	SA	1410	41876
	TAS	372	15093
	ACT/NT	461	12377
<b>TOTAL</b>		<b>15861</b>	<b>453460</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 G7 Multihole Primary Total Conventional Hip Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the G7 Multihole 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 G7 Multihole Primary Total Conventional Hip Replacement by Year of Implant**

Year of Implant	Number Revised	Total Number
2017	1	15
2018	4	49
2019	12	169
2020	8	222
2021	17	231
<b>TOTAL</b>	<b>42</b>	<b>686</b>

**TABLE 11****Revision Rates of G7 Multihole 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 G7 Multihole 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
<b>Acetabular</b>				
G7	110010250-110010277	G7 OSSEO TI ACETABULAR SHELL MULTI HOLE CEMENTLESS	NO	METAL

**Table 11: Revised Number of G7 Multihole Primary Total Conventional Hip Replacement by Catalogue Number Range**

Acetabular Range	N Revised	N Total
110010250-110010277	42	686
<b>TOTAL</b>	<b>42</b>	<b>686</b>

TABLE 12

## Revision Rates of G7 Multihole 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 G7 Multihole Primary Total Conventional Hip Replacement by Femoral Stem Component

Femoral Stem Component	N Revised	N Total
Absolut	0	4
Accolade II	0	1
Arcos	5	30
Avenir	0	18
C-Stem AMT	0	9
CLS	0	3
CORAIL	0	26
CPCS	0	2
CPT	9	165
Evolve	1	4
Exeter V40	4	19
KAR	0	1
M/L Taper	0	1
MS 30	1	17
Metafix	0	1
Mutars	0	9
Optimys	0	1
Oss	2	3
Paragon	1	3
Polarstem	0	1
Quadra-C	1	4
Redapt	0	2
S-Rom	2	19
Segmental System	0	2
Short Exeter V40	1	2
Sirius	0	1
Spectron EF	0	2
Summit	0	7
Taper Fit	0	1
Taperloc	13	252
Taperloc Microplasty	1	47
VerSys	0	9
Wagner	0	5
X-Acta	0	2
ZMR	1	13
<b>TOTAL</b>	<b>42</b>	<b>686</b>