

## Conserve Plus/Conserve Plus Total Resurfacing Hip Investigation

Note: This analysis compares the Conserve Plus/Conserve Plus head/acetabular combination with all other total resurfacing 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-2020>.

### TABLE 1

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

The revision rate of the Conserve Plus/Conserve Plus total resurfacing hip combination is compared to all other total resurfacing hip prostheses.

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

Component	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Conserve Plus/Conserve Plus	16	63	802	2.00 (1.14, 3.24)
Other Total Resurfacing Hip	1831	18187	197759	0.93 (0.88, 0.97)
<b>TOTAL</b>	<b>1847</b>	<b>18250</b>	<b>198561</b>	<b>0.93 (0.89, 0.97)</b>

TABLE 2

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

The yearly cumulative percent revision of the Conserve Plus/Conserve Plus total resurfacing hip combination is compared to all other total resurfacing hip prostheses.

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

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs
Conserve Plus/Conserve Plus	4.8 (1.6, 14.0)	4.8 (1.6, 14.0)	6.4 (2.4, 16.1)	9.6 (4.4, 20.1)	9.6 (4.4, 20.1)	9.6 (4.4, 20.1)
Other Total Resurfacing Hip	1.7 (1.5, 1.9)	2.5 (2.3, 2.7)	3.2 (2.9, 3.4)	3.9 (3.6, 4.2)	4.9 (4.6, 5.2)	5.8 (5.5, 6.2)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
Conserve Plus/Conserve Plus	12.8 (6.6, 24.0)	14.4 (7.8, 25.9)	14.4 (7.8, 25.9)	14.4 (7.8, 25.9)	16.1 (9.0, 27.9)	22.8 (14.2, 35.5)
Other Total Resurfacing Hip	6.7 (6.3, 7.1)	7.5 (7.1, 7.9)	8.3 (7.9, 8.7)	9.2 (8.8, 9.7)	9.9 (9.4, 10.4)	10.6 (10.1, 11.1)

CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs
Conserve Plus/Conserve Plus	26.2 (16.9, 39.1)	26.2 (16.9, 39.1)	26.2 (16.9, 39.1)	26.2 (16.9, 39.1)			
Other Total Resurfacing Hip	11.4 (10.9, 12.0)	12.1 (11.5, 12.6)	12.6 (12.1, 13.2)	13.3 (12.7, 13.9)	13.7 (13.0, 14.4)	14.1 (13.3, 14.8)	15.1 (13.9, 16.4)

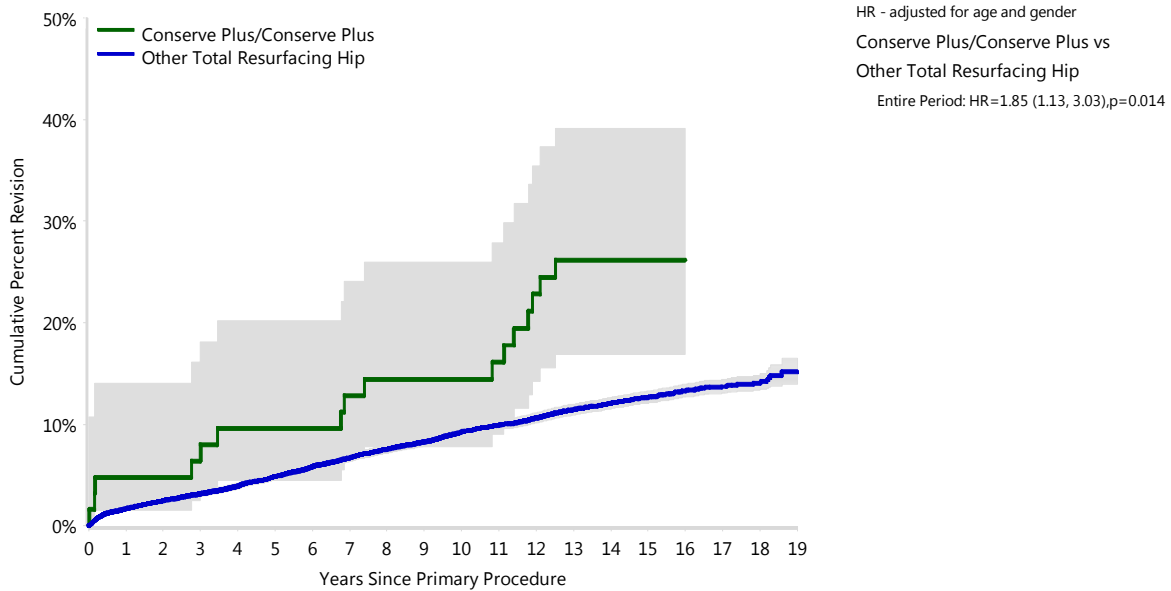
**FIGURE 1**

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

The yearly cumulative percent revision of the Conserve Plus/Conserve Plus total resurfacing hip combination is compared to all other total resurfacing 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 Resurfacing 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
Conserve Plus/Conserve Plus	63	60	59	58	56	56	56	54	53	53
Other Total Resurfacing Hip	18187	17341	16788	16249	15671	15103	14531	13950	13311	12596

Number at Risk	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs	19 Yrs
Conserve Plus/Conserve Plus	52	50	46	42	36	23	9	5	3	1
Other Total Resurfacing Hip	11508	10287	8884	7369	5845	4302	2914	1696	618	84

**TABLE 3****Primary Diagnosis for Revised Primary Total Resurfacing 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 resurfacing hip prostheses.

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

Primary Diagnosis	Conserve Plus/Conserve Plus		Other Total Resurfacing Hip	
	Number	Percent	Number	Percent
Osteoarthritis	16	100.0	1678	91.6
Developmental Dysplasia			89	4.9
Osteonecrosis			42	2.3
Other Inflammatory Arthritis			11	0.6
Rheumatoid Arthritis			9	0.5
Other			2	0.1
<b>TOTAL</b>	<b>16</b>	<b>100.0</b>	<b>1831</b>	<b>100.0</b>

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 Resurfacing Hip Replacement - Reason for Revision

Revision Diagnosis	Conserve Plus/Conserve Plus			Other Total Resurfacing Hip		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Metal Related Pathology	1	1.6	6.3	510	2.8	27.9
Loosening	9	14.3	56.3	466	2.6	25.5
Fracture	3	4.8	18.8	312	1.7	17.0
Lysis	1	1.6	6.3	170	0.9	9.3
Infection				114	0.6	6.2
Pain				111	0.6	6.1
Osteonecrosis	2	3.2	12.5	41	0.2	2.2
Prosthesis Dislocation				27	0.1	1.5
Malposition				23	0.1	1.3
Instability				8	0.0	0.4
Implant Breakage Head				6	0.0	0.3
Implant Breakage Acetabular				5	0.0	0.3
Progression Of Disease				4	0.0	0.2
Tumour				4	0.0	0.2
Leg Length Discrepancy				3	0.0	0.2
Wear Acetabulum				3	0.0	0.2
Synovitis				2	0.0	0.1
Heterotopic Bone				1	0.0	0.1
Incorrect Sizing				1	0.0	0.1
Other				20	0.1	1.1
<b>N Revision</b>	<b>16</b>	<b>25.4</b>	<b>100.0</b>	<b>1831</b>	<b>10.1</b>	<b>100.0</b>
<b>N Primary</b>	<b>63</b>			<b>18187</b>		

**FIGURE 2**

**Cumulative Incidence Revision Diagnosis of Primary Total Resurfacing 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 Conserve Plus/Conserve Plus total resurfacing hip combination. A comparative graph is provided of the cumulative incidence for the same reasons for revisions for all other total resurfacing hip prostheses.

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

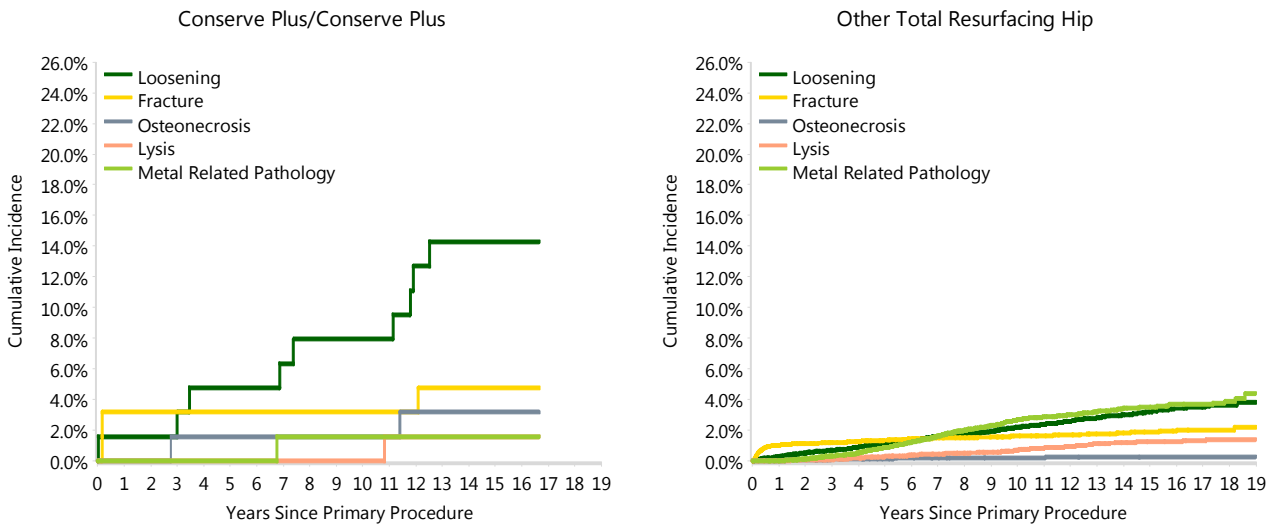


TABLE 5

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

This analysis identifies the components used in the revision of the Conserve Plus/Conserve Plus total resurfacing hip combination and compares it to the components used in the revision of all other total resurfacing 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 resurfacing hip prostheses i.e. is there a difference in the type of revision undertaken for the Conserve Plus/Conserve Plus total resurfacing hip combination compared to all other total resurfacing hip prostheses.

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

Type of Revision	Conserve Plus/Conserve Plus		Other Total Resurfacing Hip	
	Number	Percent	Number	Percent
THR (Femoral/Acetabular)	12	75.0	1318	72.0
Femoral Component	4	25.0	411	22.4
Acetabular Component			52	2.8
Cement Spacer			40	2.2
Removal of Prostheses			10	0.5
<b>N Major</b>	<b>16</b>	<b>100.0</b>	<b>1831</b>	<b>100.0</b>
<b>TOTAL</b>	<b>16</b>	<b>100.0</b>	<b>1831</b>	<b>100.0</b>

**TABLE 6****Revision Rates of Conserve Plus/Conserve Plus Primary Total Resurfacing 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: Revision Rates of Conserve Plus/Conserve Plus Primary Total Resurfacing Hip Replacement by Fixation**

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Hybrid (Femur Cemented)	16	63	802	2.00 (1.14, 3.24)
<b>TOTAL</b>	<b>16</b>	<b>63</b>	<b>802</b>	<b>2.00 (1.14, 3.24)</b>



TABLE 7

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

This enables a state by state variation to be identified for the Conserve Plus/Conserve Plus total resurfacing hip combination and provides the comparative data for each of the states for all other total resurfacing 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 7: Revision Rates of Primary Total Resurfacing Hip Replacement by State**

Component	State	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Conserve Plus/Conserve Plus	NSW	12	51	646	1.86 (0.96, 3.24)
	VIC	2	2	15	13.24 (1.60, 47.84)
	QLD	0	4	57	0.00 (0.00, 6.49)
	WA	0	1	15	0.00 (0.00, 24.96)
	SA	2	4	53	3.75 (0.45, 13.54)
	ACT/NT	0	1	16	0.00 (0.00, 23.74)
Other Total Resurfacing Hip	NSW	515	5412	58811	0.88 (0.80, 0.95)
	VIC	558	5994	71497	0.78 (0.72, 0.85)
	QLD	283	3659	34133	0.83 (0.74, 0.93)
	WA	73	880	7317	1.00 (0.78, 1.25)
	SA	322	1404	16689	1.93 (1.72, 2.15)
	TAS	17	105	1177	1.44 (0.84, 2.31)
	ACT/NT	63	733	8135	0.77 (0.60, 0.99)
<b>TOTAL</b>		<b>1847</b>	<b>18250</b>	<b>198561</b>	<b>0.93 (0.89, 0.97)</b>

**TABLE 8****Number of Revisions of Conserve Plus/Conserve Plus Primary Total Resurfacing Hip Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the Conserve Plus/Conserve Plus total resurfacing 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 2019 has a maximum of one year to be revised, whereas a primary procedure performed in 2017 has a maximum of three years to be revised.

**Table 8: Number of Revisions of Conserve Plus/Conserve Plus Primary Total Resurfacing Hip Replacement by Year of Implant**

Year of Implant	Number Revised	Total Number
2000	0	1
2001	2	4
2002	0	3
2003	3	7
2004	3	18
2005	2	15
2006	4	11
2007	1	3
2009	1	1
<b>TOTAL</b>	<b>16</b>	<b>63</b>

TABLE 9

### Revision Rates of Conserve Plus/Conserve Plus Primary Total Resurfacing 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 Conserve Plus/Conserve Plus 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>Head</b>				
Conserve Plus	38021036-38021056	COCR SUPER POLISHED RS FEMORAL HEAD	YES	METAL
<b>Acetabular</b>				
Conserve Plus	38021146-38021162	CONSERVE PLUS CUP SHELL SURFACE BEADED (METAL CEMENTLESS)	NO	METAL
Conserve Plus	38HA3642-38HA5664	TITANIUM SUPER POLISHED HA BEADED THIN ACETABULAR SHELL	NO	METAL
Conserve Plus	SPHC0346-SPHC0364	CONSERVE PLUS CUP BEADED HA	NO	METAL

**Table 9: Revision Rates of Conserve Plus/Conserve Plus Primary Total Resurfacing Hip Replacement by Catalogue Number Range**

Head Range	Acetabular Range	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
38021036-38021056	38021146-38021162	3	13	194	1.55 (0.32, 4.52)
	38HA3642-38HA5664	8	43	544	1.47 (0.63, 2.90)
	SPHC0346-SPHC0364	5	7	64	7.86 (2.55, 18.34)
<b>TOTAL</b>		<b>16</b>	<b>63</b>	<b>802</b>	<b>2.00 (1.14, 3.24)</b>