ASR Total Conventional Hip Investigation

Note: This analysis compares the ASR 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-2026.

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 2025 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the ASR 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)
ASR	2120	4421	44193	4.80 (4.60, 5.01)
Other Total Conventional Hip	19701	568612	3623071	0.54 (0.54, 0.55)
TOTAL	**21821**	**573033**	**3667264**	**0.60 (0.59, 0.60)**

Note: Prostheses no longer used in 2025 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 ASR 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
ASR	1.9 (1.5, 2.3)	4.5 (3.9, 5.1)	9.6 (8.8, 10.5)	17.3 (16.2, 18.5)	24.5 (23.3, 25.9)	32.3 (30.9, 33.7)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.1 (2.1, 2.2)	2.5 (2.4, 2.5)	2.8 (2.7, 2.8)	3.0 (3.0, 3.1)	3.3 (3.2, 3.3)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
ASR	36.9 (35.5, 38.4)	40.5 (39.0, 42.0)	42.9 (41.4, 44.5)	45.2 (43.6, 46.7)	46.6 (45.0, 48.1)	48.2 (46.7, 49.8)
Other Total Conventional Hip	3.5 (3.5, 3.6)	3.8 (3.7, 3.9)	4.1 (4.0, 4.2)	4.4 (4.3, 4.5)	4.7 (4.6, 4.8)	5.1 (5.0, 5.2)

CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
ASR	49.4 (47.8, 50.9)	50.6 (49.0, 52.2)	51.6 (50.0, 53.2)	52.0 (50.4, 53.6)	52.9 (51.3, 54.5)	53.6 (51.9, 55.2)
Other Total Conventional Hip	5.4 (5.3, 5.5)	5.8 (5.7, 5.9)	6.2 (6.1, 6.3)	6.6 (6.5, 6.7)	7.0 (6.8, 7.1)	7.3 (7.1, 7.5)

CPR	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
ASR	54.4 (52.7, 56.1)	54.9 (53.1, 56.6)					
Other Total Conventional Hip	7.7 (7.5, 7.9)	8.0 (7.8, 8.2)	8.6 (8.3, 8.9)	9.0 (8.7, 9.4)	9.6 (9.1, 10.0)	9.6 (9.2, 10.1)	10.3 (9.4, 11.2)

Note: Prostheses no longer used in 2025 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

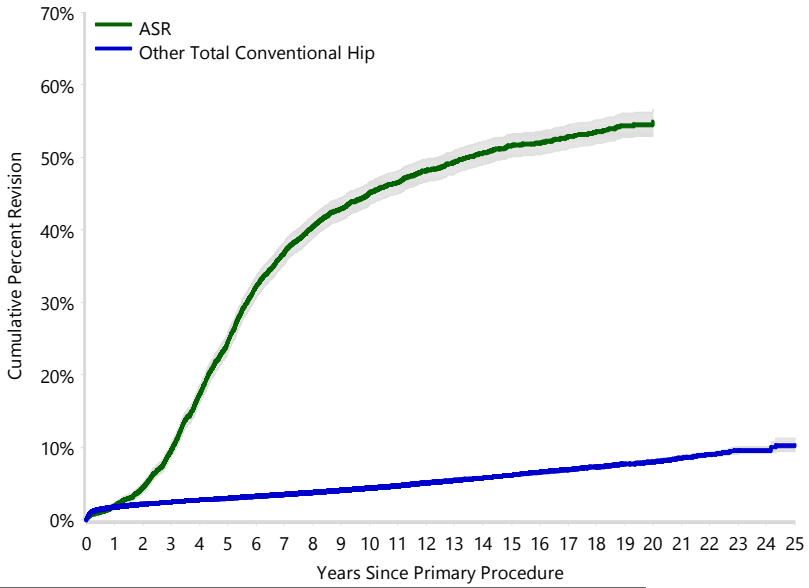
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the ASR 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



label	HR
HR - adjusted for age and sex	
ASR vs Other Total Conventional Hip	0 - 2Wk: HR=1.31 (95% CI 0.80, 2.14), p=0.289
	2Wk - 1Mth: HR=0.20 (95% CI 0.08, 0.55), p=0.001
	1Mth - 3Mth: HR=0.73 (95% CI 0.46, 1.18), p=0.204
	3Mth - 6Mth: HR=1.02 (95% CI 0.56, 1.84), p=0.954
	6Mth - 9Mth: HR=1.92 (95% CI 1.13, 3.25), p=0.015
	9Mth - 1.5Yr: HR=4.42 (95% CI 3.47, 5.62), p<0.001
	1.5Yr - 2Yr: HR=7.65 (95% CI 5.94, 9.86), p<0.001
	2Yr - 2.5Yr: HR=13.48 (95% CI 10.97, 16.57), p<0.001
	2.5Yr - 3Yr: HR=18.94 (95% CI 15.57, 23.04), p<0.001
	3Yr - 4Yr: HR=30.64 (95% CI 27.05, 34.71), p<0.001
	4Yr - 5Yr: HR=33.57 (95% CI 29.44, 38.28), p<0.001
	5Yr - 6Yr: HR=36.97 (95% CI 32.45, 42.11), p<0.001
	6Yr - 7Yr: HR=26.63 (95% CI 22.60, 31.39), p<0.001
	7Yr - 8.5Yr: HR=19.27 (95% CI 16.48, 22.55), p<0.001
	8.5Yr - 10Yr: HR=12.02 (95% CI 9.88, 14.63), p<0.001
	10Yr - 10.5Yr: HR=9.67 (95% CI 6.39, 14.62), p<0.001
	10.5Yr - 12Yr: HR=7.19 (95% CI 5.67, 9.11), p<0.001
	12Yr - 12.5Yr: HR=4.71 (95% CI 2.71, 8.17), p<0.001
	12.5Yr - 13.5Yr: HR=7.08 (95% CI 5.16, 9.73), p<0.001
	13.5Yr+: HR=3.85 (95% CI 3.13, 4.74), p<0.001

Number at Risk	0 Yr	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs
ASR	4421	4295	4135	3860	3464	3106	2736	2482

Number at Risk	0 Yr	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs
Other Total Conventional Hip	568612	501603	445433	391564	344389	299354	259516	220948

Number at Risk	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
ASR	2270	2101	1939	1828	1703	1599	1468	1354	1274
Other Total Conventional Hip	185798	153739	124848	99575	79802	63343	49730	38033	28355

Number at Risk	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
ASR	1090	732	390	153	21	0	0	0	0
Other Total Conventional Hip	20437	14638	10400	7396	4859	2863	1455	560	95

Note: Prostheses no longer used in 2025 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

	ASR		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	1934	91.2	16296	82.7
Fractured Neck Of Femur	35	1.7	1521	7.7
Osteonecrosis	75	3.5	844	4.3
Developmental Dysplasia	51	2.4	321	1.6
Rheumatoid Arthritis	13	0.6	201	1.0
Failed Internal Fixation	5	0.2	165	0.8
Tumour			157	0.8
Other Inflammatory Arthritis	4	0.2	102	0.5
Fracture/Dislocation	1	0.0	60	0.3
Other			21	0.1
Arthrodesis Takedown	2	0.1	13	0.1
TOTAL	**2120**	**100.0**	**19701**	**100.0**

Note: Prostheses no longer used in 2025 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 21.7 Years)

	ASR			Other Total Conventional Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	150	3.4	7.1	5015	0.9	25.5
Prosthesis Dislocation/Instability	28	0.6	1.3	4382	0.8	22.3
Fracture	71	1.6	3.3	4344	0.8	22.1
Loosening	333	7.5	15.7	3625	0.6	18.4
Metal Related Pathology	1285	29.1	60.6	93	0.0	0.5
Pain	67	1.5	3.2	339	0.1	1.7
Leg Length Discrepancy	4	0.1	0.2	307	0.1	1.6
Malposition	1	0.0	0.0	282	0.0	1.4
Implant Breakage Stem	5	0.1	0.2	209	0.0	1.1
Lysis	127	2.9	6.0	199	0.0	1.0
Implant Breakage Acetabular Insert				128	0.0	0.7
Wear Acetabular Insert				109	0.0	0.6
Incorrect Sizing	2	0.0	0.1	96	0.0	0.5
Implant Breakage Acetabular	9	0.2	0.4	73	0.0	0.4
Wear Head				49	0.0	0.2
Tumour	4	0.1	0.2	46	0.0	0.2
Heterotopic Bone	1	0.0	0.0	26	0.0	0.1
Implant Breakage Head				26	0.0	0.1
Wear Acetabulum	15	0.3	0.7	6	0.0	0.0
Osteonecrosis				4	0.0	0.0
Synovitis	2	0.0	0.1	2	0.0	0.0
Progression Of Disease				1	0.0	0.0
Other	16	0.4	0.8	321	0.1	1.6
N Revision	**2120**	**48.0**	**100.0**	**19682**	**3.5**	**100.0**
N Primary	**4421**			**568612**		

Note: This table is restricted to revisions within 21.7 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2025 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 ASR 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

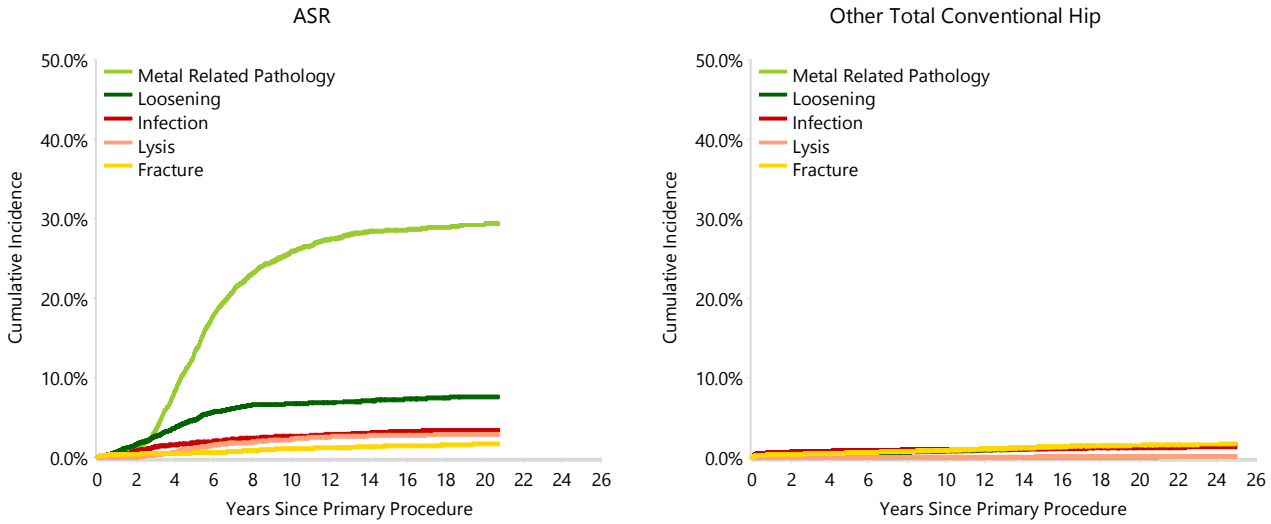


TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the ASR 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 ASR 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 21.7 Years)

	ASR		Other Total Conventional Hip	
Type of Revision	Number	Percent	Number	Percent
Femoral Component	68	3.2	6641	33.7
Acetabular Component	1586	74.8	3306	16.8
THR (Femoral/Acetabular)	348	16.4	2300	11.7
Cement Spacer	42	2.0	556	2.8
Removal of Prostheses	4	0.2	93	0.5
Reinsertion of Components	1	0.0	27	0.1
Total Femoral			12	0.1
Bipolar Head and Femoral			10	0.1
N Major	**2049**	**96.7**	**12945**	**65.8**
Head/Insert	38	1.8	5368	27.3
Head Only	24	1.1	913	4.6
Minor Components	7	0.3	285	1.4
Insert Only			168	0.9
Bipolar Only	2	0.1	1	0.0
Cement Only			1	0.0
Head/Neck/Insert			1	0.0
N Minor	**71**	**3.3**	**6737**	**34.2**
TOTAL	**2120**	**100.0**	**19682**	**100.0**

Note: This table is restricted to revisions within 21.7 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2025 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 ASR 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 ASR Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cemented	0	1
Cementless	2084	4322
Hybrid (Femur Cemented)	35	94
Reverse Hybrid (Femur Cementless)	1	4
TOTAL	**2120**	**4421**

TABLE 7

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

Bearing Surface	N Revised	N Total
Metal/Metal	2120	4421
TOTAL	**2120**	**4421**

TABLE 8

Revision Rates of Primary Total Conventional Hip Replacement by State

This enables a state by state variation to be identified for the ASR 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 8: Revised Number of Primary Total Conventional Hip Replacement by State

Component	State	N Revised	N Total
ASR	NSW	670	1493
	VIC	286	680
	QLD	346	752
	WA	217	393
	SA	437	778
	TAS	164	325
Other Total Conventional Hip	NSW	5507	167002
	VIC	4853	146558
	QLD	3968	104359
	WA	2510	64946
	SA	1887	52084
	TAS	439	18269
	ACT/NT	537	15394
TOTAL		**21821**	**573033**

Note: Prostheses no longer used in 2025 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

TABLE 9

Number of Revisions of ASR Primary Total Conventional Hip Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the ASR 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 2025 has a maximum of one year to be revised, whereas a primary procedure performed in 2023 has a maximum of three years to be revised.

Table 9: Number of Revisions of ASR Primary Total Conventional Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2004	39	84
2005	249	584
2006	447	958
2007	553	1185
2008	594	1180
2009	238	430
TOTAL	**2120**	**4421**

TABLE 10

Revision Rates of ASR 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 ASR 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					
ASR	999803944-999806370	ASR TOTAL ACETABULAR IMPLANT	NO	METAL	HA COATED
ASR	999830748-999830766	ACETABULAR COMPONENT	NO	METAL	

Table 10: Revised Number of ASR Primary Total Conventional Hip Replacement by Catalogue Number Range

Acetabular Range	N Revised	N Total
999803944-999806370	2106	4394
999830748-999830766	14	27
TOTAL	**2120**	**4421**

TABLE 11

Revision Rates of ASR 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 11: Revised Number of ASR Primary Total Conventional Hip Replacement by Femoral Stem Component

Femoral Stem Component	N Revised	N Total
C-Stem	3	9
C-Stem AMT	24	72
CLS	2	3
CORAIL	1428	2905
CORAIL RSA	3	4
Echelon	0	1
Fjord	0	2
Generic Stem	0	1
Proxima	4	6
S-Rom	103	261
Silent	9	19
Solution	0	2
Stability	0	1
Summit	540	1128
Taperloc	4	7
TOTAL	**2120**	**4421**