

CORAIL/Trabecular Metal (Shell) Total Conventional Hip Investigation

Note: This analysis compares the CORAIL/Trabecular Metal (Shell) 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-2025>.

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 2024 are excluded from the comparator.

TABLE 1
Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the CORAIL/Trabecular Metal (Shell) 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)
CORAIL/Trabecular Metal (Shell)	11	99	868	1.27 (0.63, 2.27)
Other Total Conventional Hip	19481	552055	3551575	0.55 (0.54, 0.56)
TOTAL	19492	552154	3552443	0.55 (0.54, 0.56)

Note: Prostheses no longer used in 2024 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 CORAIL/Trabecular Metal (Shell) total conventional hip combination 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	7 Yrs	8 Yrs
CORAIL/Trabecular Metal (Shell)	6.1 (2.8, 13.1)	8.3 (4.2, 15.9)	9.5 (5.0, 17.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.1, 2.2)	2.5 (2.4, 2.5)	2.8 (2.7, 2.8)	3.0 (3.0, 3.1)	3.3 (3.3, 3.4)	3.6 (3.5, 3.6)	3.9 (3.8, 3.9)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
CORAIL/Trabecular Metal (Shell)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)	11.9 (6.7, 20.4)		
Other Total Conventional Hip	4.2 (4.1, 4.2)	4.4 (4.4, 4.5)	4.8 (4.7, 4.8)	5.2 (5.1, 5.3)	5.5 (5.4, 5.6)	5.9 (5.8, 6.0)	6.3 (6.2, 6.4)	6.7 (6.6, 6.9)

CPR	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
CORAIL/Trabecular Metal (Shell)							
Other Total Conventional Hip	7.1 (6.9, 7.2)	7.4 (7.3, 7.6)	7.9 (7.7, 8.1)	8.3 (8.0, 8.5)	8.8 (8.5, 9.1)	9.3 (9.0, 9.7)	9.9 (9.4, 10.5)

Note: Prostheses no longer used in 2024 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

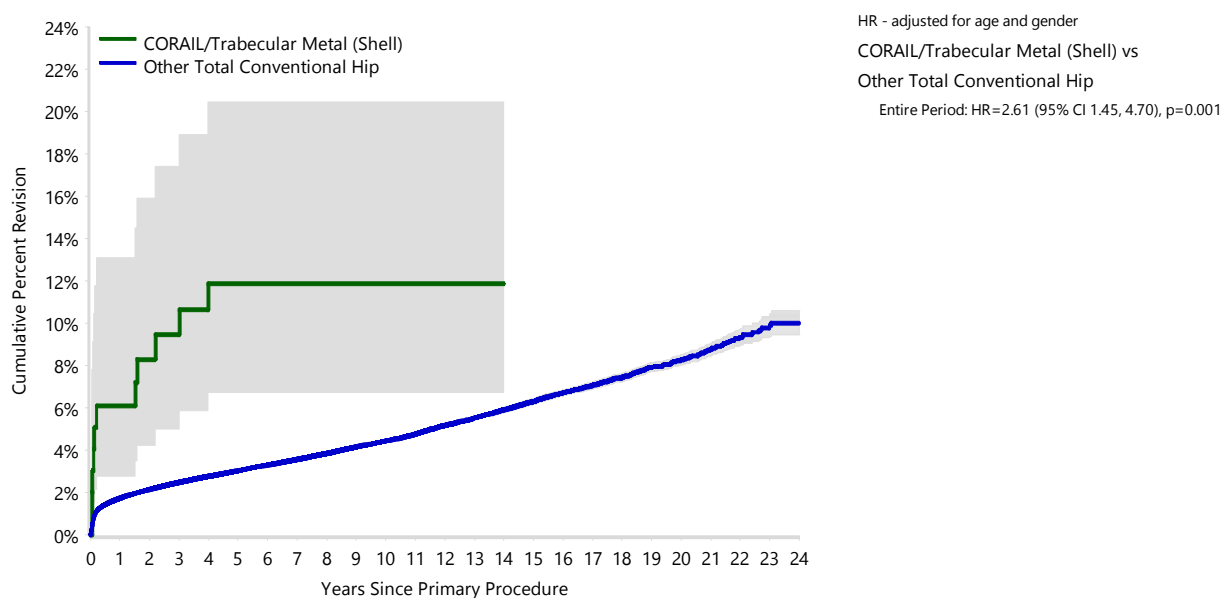
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the CORAIL/Trabecular Metal (Shell) 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



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
CORAIL/Trabecular Metal (Shell)	99	88	80	77	72	70	67	64	61	54	51	42
Other Total Conventional Hip	552055	487627	432737	384133	337141	295741	254879	217059	182172	150322	122100	99336

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	23 Yrs
CORAIL/Trabecular Metal (Shell)	35	28	21	10	5	2	0	0	0	0	0	0
Other Total Conventional Hip	80188	63971	49869	37926	28059	20579	15102	10871	7426	4536	2346	851

Note: Prostheses no longer used in 2024 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	CORAIL/Trabecular Metal (Shell)		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	7	63.6	16167	83.0
Fractured Neck Of Femur	1	9.1	1435	7.4
Osteonecrosis	1	9.1	855	4.4
Developmental Dysplasia			313	1.6
Rheumatoid Arthritis			210	1.1
Failed Internal Fixation			157	0.8
Tumour			148	0.8
Other Inflammatory Arthritis			112	0.6
Fracture/Dislocation	2	18.2	51	0.3
Other			19	0.1
Arthrodesis Takedown			14	0.1
TOTAL	11	100.0	19481	100.0

Note: Prostheses no longer used in 2024 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 17.6 Years)

Revision Diagnosis	CORAIL/Trabecular Metal (Shell)			Other Total Conventional Hip		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	4	4.0	36.4	4745	0.9	24.6
Prosthesis Dislocation/Instability	2	2.0	18.2	4376	0.8	22.7
Fracture	1	1.0	9.1	4311	0.8	22.3
Loosening	4	4.0	36.4	3649	0.7	18.9
Pain				326	0.1	1.7
Leg Length Discrepancy				297	0.1	1.5
Malposition				267	0.0	1.4
Implant Breakage Stem				196	0.0	1.0
Lysis				194	0.0	1.0
Implant Breakage Acetabular Insert				126	0.0	0.7
Incorrect Sizing				98	0.0	0.5
Wear Acetabular Insert				96	0.0	0.5
Metal Related Pathology				83	0.0	0.4
Implant Breakage Acetabular				67	0.0	0.3
Wear Head				41	0.0	0.2
Tumour				40	0.0	0.2
Implant Breakage Head				29	0.0	0.2
Heterotopic Bone				27	0.0	0.1
Wear Acetabulum				9	0.0	0.0
Osteonecrosis				3	0.0	0.0
Synovitis				1	0.0	0.0
Other				310	0.1	1.6
N Revision	11	11.1	100.0	19291	3.5	100.0
N Primary	99			552055		

Note: This table is restricted to revisions within 17.6 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2024 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 CORAIL/Trabecular Metal (Shell) 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

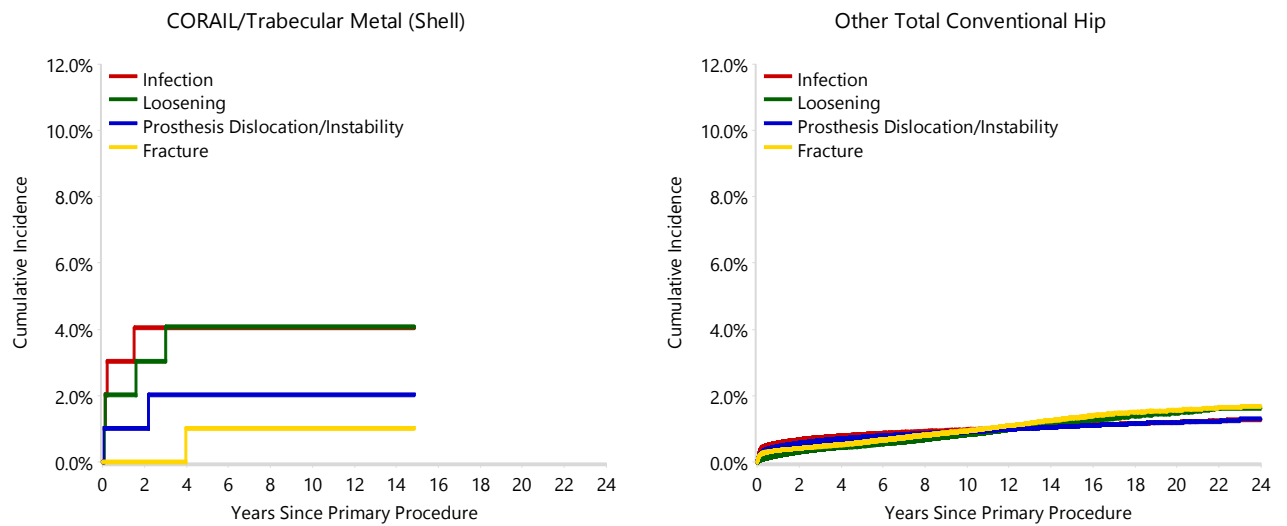


TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the CORAIL/Trabecular Metal (Shell) 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 CORAIL/Trabecular Metal (Shell) 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 17.6 Years)

Type of Revision	CORAIL/Trabecular Metal (Shell)		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	3	27.3	6516	33.8
Acetabular Component	2	18.2	3363	17.4
THR (Femoral/Acetabular)	1	9.1	2212	11.5
Cement Spacer			593	3.1
Removal of Prostheses	1	9.1	97	0.5
Reinsertion of Components			29	0.2
Total Femoral			13	0.1
Bipolar Head and Femoral			9	0.0
N Major	7	63.6	12832	66.5
Head/Insert	2	18.2	5056	26.2
Head Only			921	4.8
Minor Components	1	9.1	302	1.6
Insert Only	1	9.1	177	0.9
Bipolar Only			1	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	4	36.4	6459	33.5
TOTAL	11	100.0	19291	100.0

Note: This table is restricted to revisions within 17.6 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2024 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 CORAIL/Trabecular Metal (Shell) 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 CORAIL/Trabecular Metal (Shell) Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cementless	10	86
Hybrid (Femur Cemented)	0	1
Reverse Hybrid (Femur Cementless)	1	12
TOTAL	11	99

TABLE 7**Revision Rates of CORAIL/Trabecular Metal (Shell) 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 CORAIL/Trabecular Metal (Shell) Primary Total Conventional Hip Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Ceramic/Non XLPE	0	1
Ceramic/XLPE	4	31
Metal/Non XLPE	1	3
Metal/XLPE	6	64
TOTAL	11	99

TABLE 8

Revision Rates of CORAIL/Trabecular Metal (Shell) 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 CORAIL/Trabecular Metal (Shell) Primary Total Conventional Hip Replacement by Approach

Approach	N Revised	N Total
Lateral	1	6
Posterior	1	10
TOTAL	2	16

Note: Excludes 83 procedures with no approach recorded

TABLE 9
Number of Revisions of CORAIL/Trabecular Metal (Shell) Primary Total Conventional Hip Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the CORAIL/Trabecular Metal (Shell) 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 2024 has a maximum of one year to be revised, whereas a primary procedure performed in 2022 has a maximum of three years to be revised.

Table 9: Number of Revisions of CORAIL/Trabecular Metal (Shell) Primary Total Conventional Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2007	2	5
2008	3	10
2009	1	17
2010	2	20
2011	0	9
2012	1	8
2013	0	8
2014	0	6
2015	0	1
2016	2	6
2017	0	2
2018	0	4
2019	0	1
2020	0	1
2024	0	1
TOTAL	11	99