

MiniMax Total Conventional Hip Investigation

Note: This analysis compares the MiniMax femoral stem 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-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 MiniMax 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)
MiniMax	23	417	2284	1.01 (0.64, 1.51)
Other Total Conventional Hip	19469	551737	3550159	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 MiniMax 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	7 Yrs	8 Yrs
MiniMax	4.6 (2.9, 7.1)	5.3 (3.5, 7.9)	5.5 (3.7, 8.2)	5.5 (3.7, 8.2)	5.5 (3.7, 8.2)	5.5 (3.7, 8.2)	5.5 (3.7, 8.2)	
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
MiniMax								
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
MiniMax							
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.

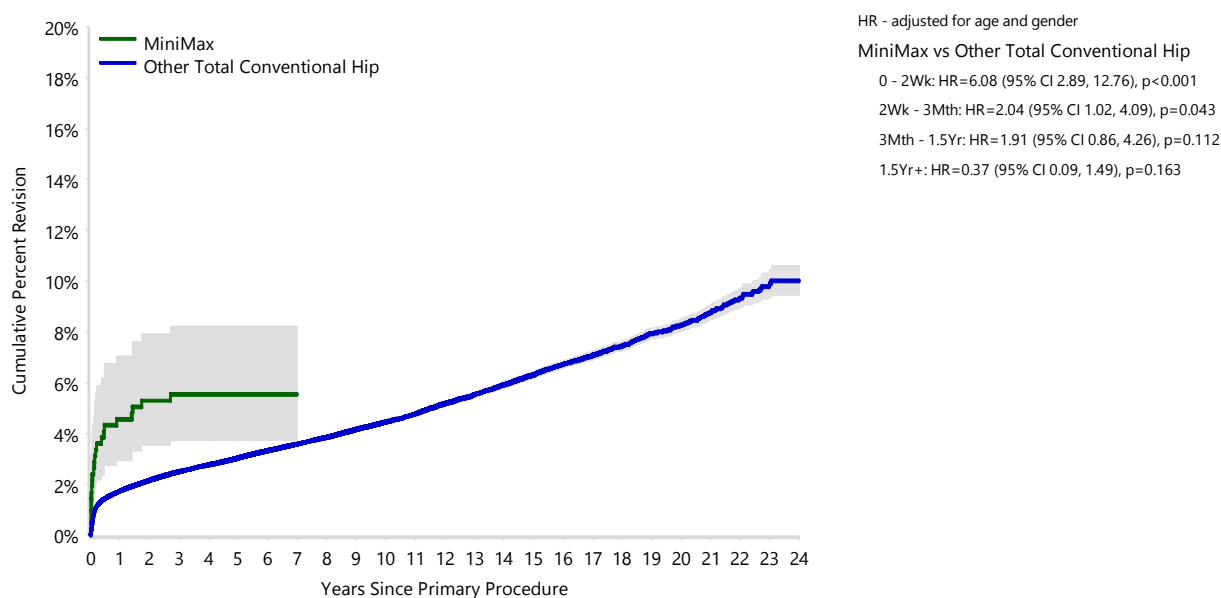
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the MiniMax 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	11 Yrs
MiniMax	417	394	388	382	362	318	197	44	4	0	0	0
Other Total Conventional Hip	551737	487321	432429	383828	336851	295493	254749	217079	182229	150376	122151	99378

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
MiniMax	0	0	0	0	0	0	0	0	0	0	0	0
Other Total Conventional Hip	80223	63999	49890	37936	28064	20581	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	MiniMax		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	23	100.0	16151	83.0
Fractured Neck Of Femur			1436	7.4
Osteonecrosis			856	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			53	0.3
Other			19	0.1
Arthrodesis Takedown			14	0.1
TOTAL	23	100.0	19469	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 8.6 Years)

Revision Diagnosis	Number	MiniMax		Other Total Conventional Hip		
		% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	3	0.7	13.0	4503	0.8	26.5
Prosthesis Dislocation/Instability	1	0.2	4.3	4076	0.7	24.0
Fracture	12	2.9	52.2	3609	0.7	21.3
Loosening	2	0.5	8.7	2966	0.5	17.5
Pain				298	0.1	1.8
Leg Length Discrepancy	2	0.5	8.7	293	0.1	1.7
Malposition				253	0.0	1.5
Implant Breakage Stem				131	0.0	0.8
Implant Breakage Acetabular Insert				101	0.0	0.6
Incorrect Sizing	1	0.2	4.3	96	0.0	0.6
Lysis				92	0.0	0.5
Metal Related Pathology				60	0.0	0.4
Implant Breakage Acetabular				56	0.0	0.3
Tumour				39	0.0	0.2
Wear Acetabular Insert				32	0.0	0.2
Wear Head				32	0.0	0.2
Heterotopic Bone				27	0.0	0.2
Implant Breakage Head				21	0.0	0.1
Wear Acetabulum				4	0.0	0.0
Osteonecrosis				3	0.0	0.0
Synovitis				1	0.0	0.0
Other	2	0.5	8.7	283	0.1	1.7
N Revision	23	5.5	100.0	16976	3.1	100.0
N Primary	417			551737		

Note: This table is restricted to revisions within 8.6 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 MiniMax 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.

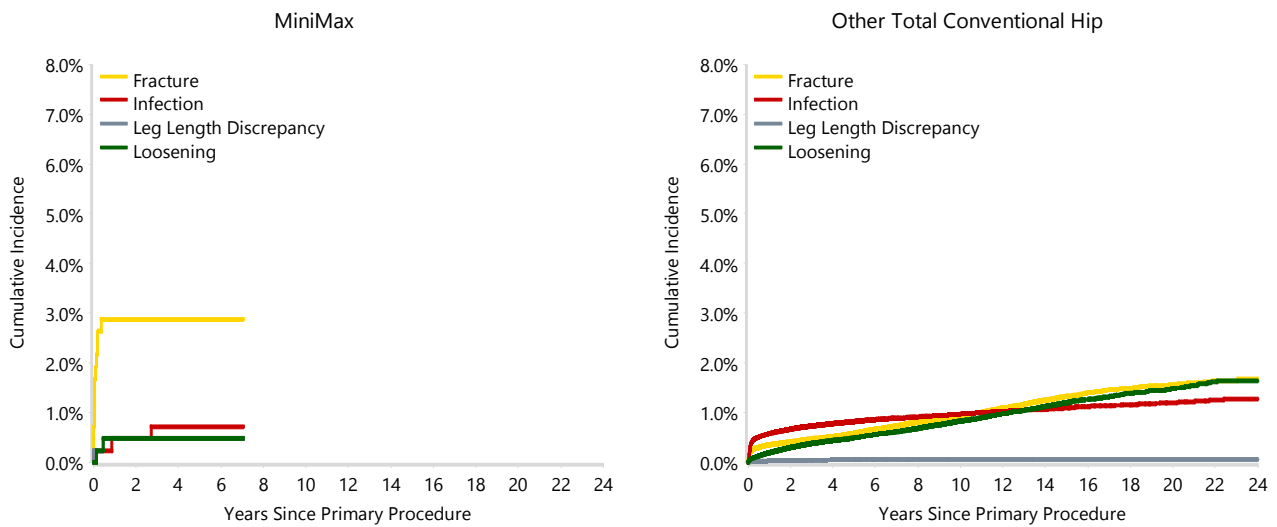
Figure 2: Cumulative Incidence Revision Diagnosis for Primary Total Conventional Hip Replacement

TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the MiniMax 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 MiniMax 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 8.6 Years)

Type of Revision	MiniMax		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	11	47.8	5512	32.5
Acetabular Component	1	4.3	2910	17.1
THR (Femoral/Acetabular)	3	13.0	1842	10.9
Cement Spacer	1	4.3	545	3.2
Removal of Prostheses			89	0.5
Reinsertion of Components	1	4.3	28	0.2
Total Femoral			11	0.1
Bipolar Head and Femoral			9	0.1
N Major	17	73.9	10946	64.5
Head/Insert	2	8.7	4704	27.7
Head Only	4	17.4	884	5.2
Minor Components			268	1.6
Insert Only			171	1.0
Bipolar Only			1	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	6	26.1	6030	35.5
TOTAL	23	100.0	16976	100.0

Note: This table is restricted to revisions within 8.6 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 MiniMax 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 MiniMax Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cementless	23	417
TOTAL	23	417

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

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	12	216
Ceramic/Non XLPE	5	123
Ceramic/XLPE	5	74
Metal/Non XLPE	0	2
Metal/XLPE	1	2
TOTAL	23	417

TABLE 8

Revision Rates of MiniMax 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 MiniMax Primary Total Conventional Hip Replacement by Approach

Approach	N Revised	N Total
Anterior	23	403
Posterior	0	14
TOTAL	23	417

TABLE 9**Number of Revisions of MiniMax Primary Total Conventional Hip Replacement by Year of Implant**

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

Year of Implant	Number Revised	Total Number
2016	0	4
2017	3	43
2018	7	170
2019	8	133
2020	2	41
2021	2	19
2022	1	5
2024	0	2
TOTAL	23	417

TABLE 10**Revision Rates of MiniMax 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 10: Revised Number of MiniMax Primary Total Conventional Hip Replacement by Acetabular Component

Acetabular Component	N Revised	N Total
Agilis	0	1
Mpact	12	184
Trinity	0	1
Versafitcup CC	6	106
Versafitcup DM	5	125
TOTAL	23	417