Basis Bipolar Hip Investigation

Note: This analysis compares the Basis femoral stem prosthesis with all other bipolar 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-2023.

Note: Procedures using prostheses with no recorded use in 2022 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Bipolar Hip Replacement

The revision rate of the Basis bipolar hip prosthesis is compared to all other bipolar hip prostheses.

Table 1: Revision Rates of Primary Bipolar Hip Replacement

Component	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Basis	18	156	837	2.15 (1.27, 3.40)
Other Bipolar Hip	936	30207	90034	1.04 (0.97, 1.11)
TOTAL	**954**	**30363**	**90871**	**1.05 (0.98, 1.12)**

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 2

Yearly Cumulative Percent Revision of Primary Bipolar Hip Replacement

The yearly cumulative percent revision of the Basis bipolar hip prosthesis is compared to all other bipolar hip prostheses.

Table 2: Yearly Cumulative Percent Revision of Primary Bipolar Hip Replacement

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
Basis	1.5 (0.4, 5.8)	6.4 (3.3, 12.5)	10.1 (5.9, 17.2)	10.1 (5.9, 17.2)	12.6 (7.6, 20.6)	12.6 (7.6, 20.6)	12.6 (7.6, 20.6)	16.1 (9.9, 25.6)
Other Bipolar Hip	2.5 (2.3, 2.7)	3.1 (2.9, 3.3)	3.6 (3.3, 3.8)	3.9 (3.6, 4.1)	4.2 (3.9, 4.5)	4.4 (4.1, 4.8)	4.7 (4.4, 5.1)	5.1 (4.7, 5.5)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs
Basis							
Other Bipolar Hip	5.4 (4.9, 5.9)	5.7 (5.1, 6.2)	5.7 (5.2, 6.3)	5.8 (5.3, 6.5)	6.1 (5.4, 6.8)	6.5 (5.7, 7.3)	7.1 (6.1, 8.2)

CPR	16 Yrs	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs
Basis							
Other Bipolar Hip	7.6 (6.4, 8.9)	7.9 (6.6, 9.4)	7.9 (6.6, 9.4)	8.5 (6.8, 10.6)	8.5 (6.8, 10.6)		

Note: Prostheses no longer used in 2022 are excluded from the comparator.

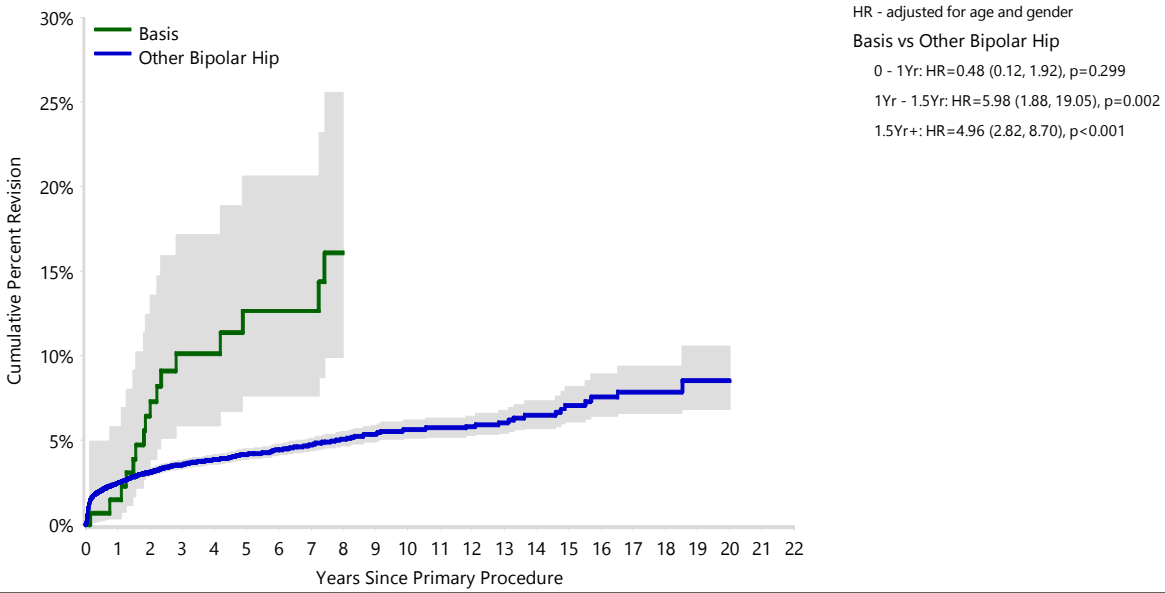
FIGURE 1

Yearly Cumulative Percent Revision of Primary Bipolar Hip Replacement

The yearly cumulative percent revision of the Basis bipolar hip prosthesis is compared to all other bipolar 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 Bipolar 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
Basis	156	123	109	84	73	67	58	54	44	39	28	24
Other Bipolar Hip	30207	19464	14506	10878	8105	6033	4476	3325	2411	1854	1434	1178

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
Basis	21	16	14	8	5	1	0	0	0	0	0
Other Bipolar Hip	936	739	579	446	333	255	171	104	41	9	0

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 3

Primary Diagnosis for Revised Primary Bipolar 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 bipolar hip prostheses.

Table 3: Primary Diagnosis for Revised Primary Bipolar Hip Replacement

	Basis		Other Bipolar Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Fractured Neck Of Femur	17	94.4	858	91.7
Tumour			30	3.2
Osteoarthritis	1	5.6	29	3.1
Failed Internal Fixation			10	1.1
Osteonecrosis			8	0.9
Other			1	0.1
TOTAL	**18**	**100.0**	**936**	**100.0**

Note: Prostheses no longer used in 2022 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 Bipolar Hip Replacement - Reason for Revision (Follow-up Limited to 17.3 Years)

	Basis			Other Bipolar Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	3	1.9	16.7	287	1.0	30.7
Prosthesis Dislocation/Instability	1	0.6	5.6	230	0.8	24.6
Fracture				174	0.6	18.6
Loosening	10	6.4	55.6	85	0.3	9.1
Chondrolysis/Acetab. Erosion	1	0.6	5.6	74	0.2	7.9
Pain	1	0.6	5.6	54	0.2	5.8
Tumour				5	0.0	0.5
Lysis	2	1.3	11.1	4	0.0	0.4
Leg Length Discrepancy				3	0.0	0.3
Malposition				3	0.0	0.3
Implant Breakage Stem				2	0.0	0.2
Incorrect Sizing				2	0.0	0.2
Progression Of Disease				2	0.0	0.2
Heterotopic Bone				1	0.0	0.1
Implant Breakage Head				1	0.0	0.1
Metal Related Pathology				1	0.0	0.1
Osteonecrosis				1	0.0	0.1
Other				6	0.0	0.6
N Revision	**18**	**11.5**	**100.0**	**935**	**3.1**	**100.0**
N Primary	**156**			**30207**		

Note: This table is restricted to revisions within 17.3 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2022 are excluded from the comparator.

FIGURE 2

Cumulative Incidence Revision Diagnosis of Primary Bipolar 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 Basis bipolar hip prosthesis. A comparative graph is provided of the cumulative incidence for the same reasons for revisions for all other bipolar hip prostheses.

Figure 2: Cumulative Incidence Revision Diagnosis for Primary Bipolar Hip Replacement

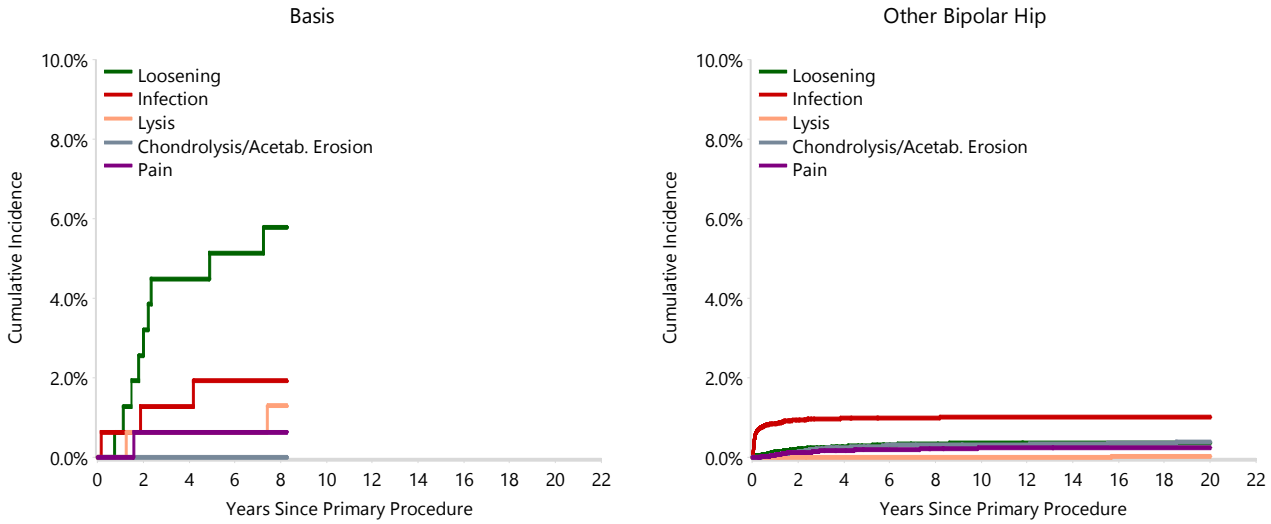


TABLE 5

Type of Revision Performed for Primary Bipolar Hip Replacement

This analysis identifies the components used in the revision of the Basis bipolar hip prosthesis and compares it to the components used in the revision of all other bipolar 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 bipolar hip prostheses i.e. is there a difference in the type of revision undertaken for the Basis bipolar hip prosthesis compared to all other bipolar hip prostheses.

Table 5: Primary Bipolar Hip Replacement - Type of Revision (Follow-up Limited to 17.3 Years)

	Basis		Other Bipolar Hip	
Type of Revision	Number	Percent	Number	Percent
Acetabular Component	3	16.7	295	31.6
THR (Femoral/Acetabular)	11	61.1	168	18.0
Bipolar Head and Femoral	1	5.6	128	13.7
Cement Spacer	2	11.1	39	4.2
Femoral Component			38	4.1
Removal of Prostheses			24	2.6
Reinsertion of Components			1	0.1
N Major	**17**	**94.4**	**693**	**74.1**
Bipolar Only			191	20.4
Head Only	1	5.6	28	3.0
Minor Components			23	2.5
N Minor	**1**	**5.6**	**242**	**25.9**
TOTAL	**18**	**100.0**	**935**	**100.0**

Note: This table is restricted to revisions within 17.3 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 6

Revision Rates of Primary Bipolar Hip Replacement by State

This enables a state by state variation to be identified for the Basis bipolar hip prosthesis and provides the comparative data for each of the states for all other bipolar 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 6: Revised Number of Primary Bipolar Hip Replacement by State

Component	State	N Revised	N Total
Basis	QLD	18	156
Other Bipolar Hip	NSW	303	10955
	VIC	190	5284
	QLD	202	6372
	WA	90	2380
	SA	80	3009
	TAS	23	618
	ACT/NT	48	1589
TOTAL		**954**	**30363**

Note: Prostheses no longer used in 2022 are excluded from the comparator.

TABLE 7

Number of Revisions of Basis Primary Bipolar Hip Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the Basis bipolar 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 2022 has a maximum of one year to be revised, whereas a primary procedure performed in 2020 has a maximum of three years to be revised.

Table 7: Number of Revisions of Basis Primary Bipolar Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2001	1	22
2002	2	15
2003	0	5
2005	3	10
2006	1	13
2007	0	9
2008	2	11
2009	1	4
2010	1	7
2011	0	8
2012	4	21
2013	2	24
2014	1	6
2015	0	1
TOTAL	**18**	**156**

TABLE 8

Revision Rates of Basis Primary Bipolar 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 Basis 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	Fixation
Femoral Stem					
Basis	71312261-71312265	BASIS FEMORAL COMPONENT	YES	METAL	MATT

Table 8: Revised Number of Basis Primary Bipolar Hip Replacement by Catalogue Number Range

Femoral Stem Range	N Revised	N Total
71312261-71312265	18	156
TOTAL	**18**	**156**

TABLE 9

Revision Rates of Basis Primary Bipolar 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 9: Revised Number of Basis Primary Bipolar Hip Replacement by Bipolar Component

Bipolar Component	N Revised	N Total
Convene	3	42
Tandem	15	114
TOTAL	**18**	**156**