Meridian/ABGII Total Conventional Hip Investigation

Note: This analysis compares the Meridian/ABGII 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 Meridian/ABGII 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)
Meridian/ABGII	22	143	1839	1.20 (0.75, 1.81)
Other Total Conventional Hip	19492	552154	3552443	0.55 (0.54, 0.56)
TOTAL	**19514**	**552297**	**3554281**	**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 Meridian/ABGII 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
Meridian/ABGII	2.1 (0.7, 6.4)	3.5 (1.5, 8.3)	5.0 (2.4, 10.1)	6.4 (3.4, 12.0)	6.4 (3.4, 12.0)	6.4 (3.4, 12.0)	7.3 (4.0, 13.2)	7.3 (4.0, 13.2)
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
Meridian/ABGII	8.3 (4.6, 14.5)	8.3 (4.6, 14.5)	8.3 (4.6, 14.5)	9.4 (5.4, 16.0)	11.6 (7.0, 19.1)	12.8 (7.8, 20.7)	14.3 (8.8, 22.7)	17.3 (10.9, 26.6)
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
Meridian/ABGII	17.3 (10.9, 26.6)	21.0 (13.6, 31.7)					
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.

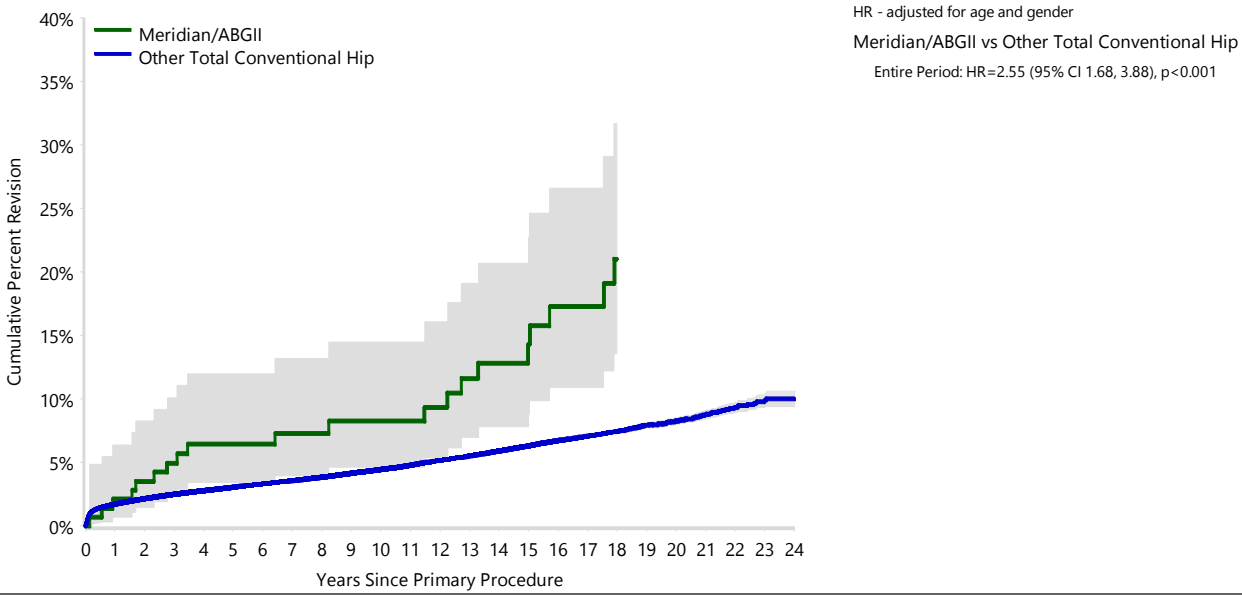
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the Meridian/ABGII 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
Meridian/ABGII	143	139	136	131	123	116	110	102	97	89	87	84
Other Total Conventional Hip	552154	487715	432817	384210	337213	295811	254946	217123	182233	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
Meridian/ABGII	81	76	71	59	54	49	41	36	33	25	22	7
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

	Meridian/ABGII		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	20	90.9	16174	83.0
Fractured Neck Of Femur			1436	7.4
Osteonecrosis	1	4.5	856	4.4
Developmental Dysplasia			313	1.6
Rheumatoid Arthritis	1	4.5	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	**22**	**100.0**	**19492**	**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

	Meridian/ABGII			Other Total Conventional Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	4	2.8	18.2	4771	0.9	24.5
Prosthesis Dislocation/Instability	5	3.5	22.7	4403	0.8	22.6
Fracture	1	0.7	4.5	4347	0.8	22.3
Loosening	5	3.5	22.7	3707	0.7	19.0
Pain	2	1.4	9.1	327	0.1	1.7
Leg Length Discrepancy				297	0.1	1.5
Malposition				269	0.0	1.4
Lysis	4	2.8	18.2	209	0.0	1.1
Implant Breakage Stem	1	0.7	4.5	201	0.0	1.0
Implant Breakage Acetabular Insert				127	0.0	0.7
Wear Acetabular Insert				109	0.0	0.6
Incorrect Sizing				98	0.0	0.5
Metal Related Pathology				92	0.0	0.5
Implant Breakage Acetabular				68	0.0	0.3
Wear Head				43	0.0	0.2
Tumour				40	0.0	0.2
Implant Breakage Head				31	0.0	0.2
Heterotopic Bone				27	0.0	0.1
Wear Acetabulum				10	0.0	0.1
Osteonecrosis				3	0.0	0.0
Synovitis				1	0.0	0.0
Other				312	0.1	1.6
N Revision	**22**	**15.4**	**100.0**	**19492**	**3.5**	**100.0**
N Primary	**143**			**552154**		

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 Meridian/ABGII 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

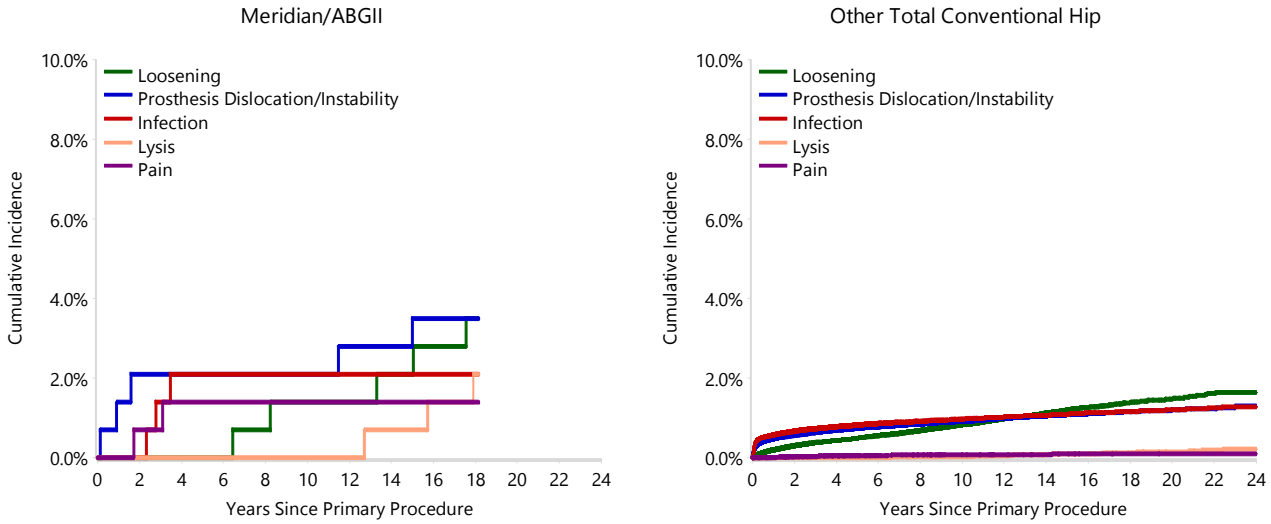


TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the Meridian/ABGII 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 Meridian/ABGII total conventional hip combination compared to all other total conventional hip prostheses.

Table 5: Primary Total Conventional Hip Replacement - Type of Revision

	Meridian/ABGII		Other Total Conventional Hip	
Type of Revision	Number	Percent	Number	Percent
Femoral Component			6562	33.7
Acetabular Component	10	45.5	3419	17.5
THR (Femoral/Acetabular)	3	13.6	2258	11.6
Cement Spacer	3	13.6	593	3.0
Removal of Prostheses	1	4.5	98	0.5
Reinsertion of Components			29	0.1
Total Femoral			13	0.1
Bipolar Head and Femoral			9	0.0
N Major	**17**	**77.3**	**12981**	**66.6**
Head/Insert	3	13.6	5100	26.2
Head Only	2	9.1	924	4.7
Minor Components			305	1.6
Insert Only			179	0.9
Bipolar Only			1	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	**5**	**22.7**	**6511**	**33.4**
TOTAL	**22**	**100.0**	**19492**	**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 6

Revision Rates of Meridian/ABGII 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 Meridian/ABGII Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cementless	22	143
TOTAL	**22**	**143**

TABLE 7

Revision Rates of Meridian/ABGII 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 Meridian/ABGII Primary Total Conventional Hip Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Ceramic/Non XLPE	1	1
Metal/Non XLPE	21	142
TOTAL	**22**	**143**

TABLE 8

Revision Rates of Primary Total Conventional Hip Replacement by State

This enables a state by state variation to be identified for the Meridian/ABGII total conventional hip combination 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
Meridian/ABGII	NSW	22	143
Other Total Conventional Hip	NSW	5288	159916
	VIC	4851	143812
	QLD	3893	100102
	WA	2492	62236
	SA	1926	51998
	TAS	448	18480
	ACT/NT	594	15610
TOTAL		**19514**	**552297**

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 9

Number of Revisions of Meridian/ABGII Primary Total Conventional Hip Replacement by Year of Implant

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

Year of Implant	Number Revised	Total Number
2001	1	19
2002	10	67
2003	7	31
2004	3	22
2005	1	4
TOTAL	**22**	**143**

TABLE 10

Revision Rates of Meridian/ABGII 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 Meridian/ABGII 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
Femoral Stem					
Meridian	62610001-62610018	MERIDIAN PA STEM #9/19MM	NO	METAL	
Acetabular					
ABGII	48401042-48401074	ABG II 5 HOLE CUP WITH HA	NO	METAL	HA COATED
ABGII	48402042-48402070	ABG II NO-HOLE CUP WITH HA	NO	METAL	HA COATED

Table 10: Revised Number of Meridian/ABGII Primary Total Conventional Hip Replacement by Catalogue Number Range

Femoral Stem Range	Acetabular Range	N Revised	N Total
62610001-62610018	48401042-48401074	7	63
	48402042-48402070	15	80
TOTAL		**22**	**143**