Accolade II/Trident Tritanium (Shell) Total Conventional Hip Investigation

Note: This analysis compares the Accolade II/Trident Tritanium (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-2024.

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 2023 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the Accolade II/Trident Tritanium (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)
Accolade II/Trident Tritanium (Shell)	141	4213	15344	0.92 (0.77, 1.08)
Other Total Conventional Hip	19108	534328	3439297	0.56 (0.55, 0.56)
TOTAL	**19249**	**538541**	**3454641**	**0.56 (0.55, 0.57)**

Note: Prostheses no longer used in 2023 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 Accolade II/Trident Tritanium (Shell) total conventional hip combination is compared to all other total conventional hip prostheses.

Table 2: Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs
Accolade II/Trident Tritanium (Shell)	2.2 (1.8, 2.7)	2.9 (2.4, 3.5)	3.2 (2.7, 3.8)	3.6 (3.1, 4.3)	3.9 (3.3, 4.6)	4.2 (3.5, 5.0)	4.6 (3.7, 5.6)	4.6 (3.7, 5.6)
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.2 (2.1, 2.2)	2.5 (2.5, 2.5)	2.8 (2.7, 2.8)	3.1 (3.0, 3.1)	3.3 (3.3, 3.4)	3.6 (3.6, 3.7)	3.9 (3.8, 4.0)

CPR	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Accolade II/Trident Tritanium (Shell)								
Other Total Conventional Hip	4.2 (4.1, 4.3)	4.5 (4.5, 4.6)	4.9 (4.8, 4.9)	5.3 (5.2, 5.4)	5.7 (5.6, 5.8)	6.0 (5.9, 6.2)	6.5 (6.3, 6.6)	6.9 (6.7, 7.0)

CPR	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs
Accolade II/Trident Tritanium (Shell)							
Other Total Conventional Hip	7.3 (7.1, 7.4)	7.6 (7.5, 7.8)	8.2 (8.0, 8.4)	8.5 (8.2, 8.7)	9.0 (8.7, 9.3)	9.7 (9.2, 10.1)	10.3 (9.5, 11.2)

Note: Prostheses no longer used in 2023 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

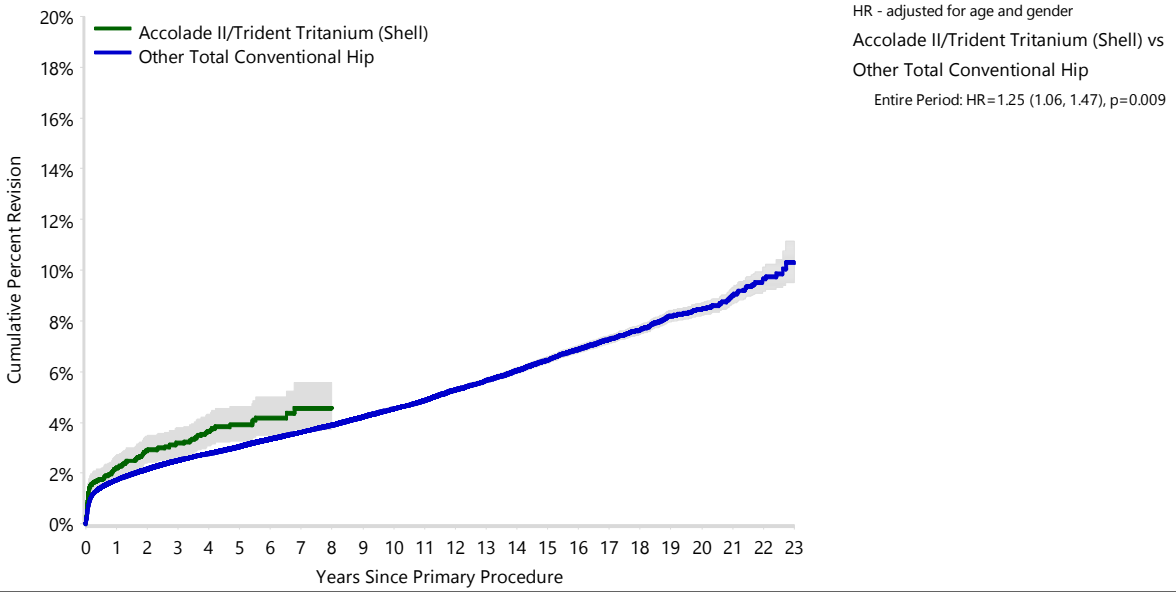
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the Accolade II/Trident Tritanium (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
Accolade II/Trident Tritanium (Shell)	4213	3766	3074	2262	1684	1197	810	359	135	28	1	1
Other Total Conventional Hip	534328	471879	422732	374906	331227	287782	246979	209262	174439	143273	117824	96250

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
Accolade II/Trident Tritanium (Shell)	0	0	0	0	0	0	0	0	0	0	0	0
Other Total Conventional Hip	77815	61602	47695	35979	26857	20094	14821	10048	6170	3221	1205	203

Note: Prostheses no longer used in 2023 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

	Accolade II/Trident Tritanium (Shell)		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	129	91.5	15822	82.8
Fractured Neck Of Femur	2	1.4	1418	7.4
Osteonecrosis	5	3.5	854	4.5
Developmental Dysplasia	4	2.8	316	1.7
Rheumatoid Arthritis	1	0.7	207	1.1
Failed Internal Fixation			151	0.8
Tumour			149	0.8
Other Inflammatory Arthritis			106	0.6
Fracture/Dislocation			53	0.3
Other			17	0.1
Arthrodesis Takedown			15	0.1
TOTAL	**141**	**100.0**	**19108**	**100.0**

Note: Prostheses no longer used in 2023 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 11.6 Years)

	Accolade II/Trident Tritanium (Shell)			Other Total Conventional Hip		
Revision Diagnosis	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	67	1.6	47.5	4308	0.8	24.2
Prosthesis Dislocation/Instability	8	0.2	5.7	4215	0.8	23.6
Fracture	28	0.7	19.9	3883	0.7	21.8
Loosening	24	0.6	17.0	3396	0.6	19.0
Pain	7	0.2	5.0	317	0.1	1.8
Leg Length Discrepancy	1	0.0	0.7	289	0.1	1.6
Malposition				265	0.0	1.5
Implant Breakage Stem				162	0.0	0.9
Lysis	2	0.0	1.4	142	0.0	0.8
Implant Breakage Acetabular Insert				119	0.0	0.7
Incorrect Sizing	2	0.0	1.4	100	0.0	0.6
Implant Breakage Acetabular				68	0.0	0.4
Wear Acetabular Insert				66	0.0	0.4
Metal Related Pathology				64	0.0	0.4
Wear Head				43	0.0	0.2
Tumour				42	0.0	0.2
Implant Breakage Head				29	0.0	0.2
Heterotopic Bone				26	0.0	0.1
Wear Acetabulum				8	0.0	0.0
Osteonecrosis				2	0.0	0.0
Progression Of Disease				2	0.0	0.0
Synovitis				1	0.0	0.0
Other	2	0.0	1.4	283	0.1	1.6
N Revision	**141**	**3.3**	**100.0**	**17830**	**3.3**	**100.0**
N Primary	**4213**			**534328**		

Note: This table is restricted to revisions within 11.6 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2023 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 Accolade II/Trident Tritanium (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

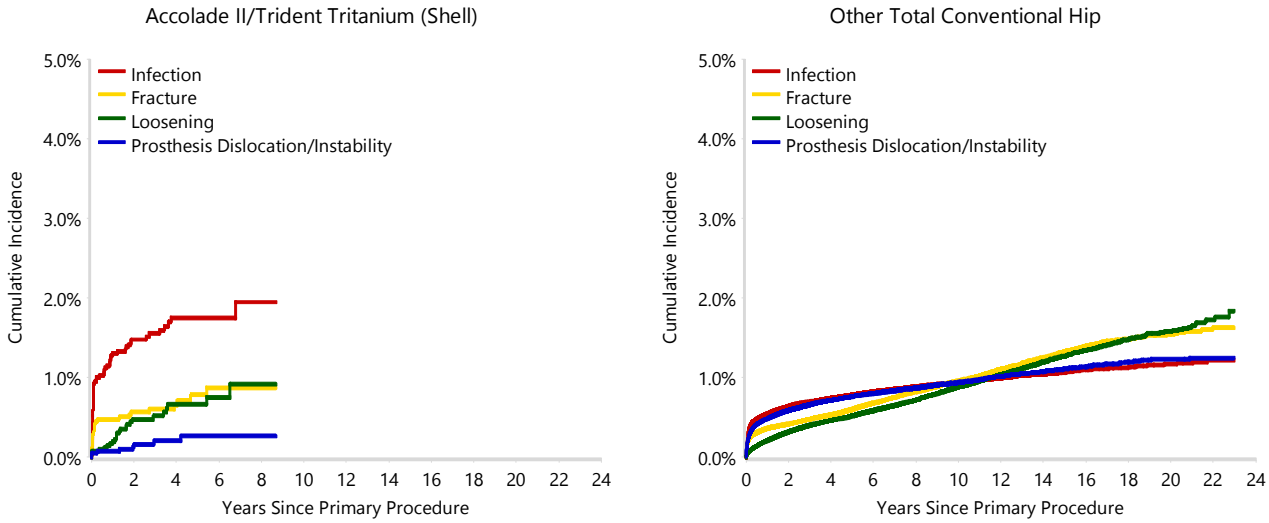


TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the Accolade II/Trident Tritanium (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 Accolade II/Trident Tritanium (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 11.6 Years)

	Accolade II/Trident Tritanium (Shell)		Other Total Conventional Hip	
Type of Revision	Number	Percent	Number	Percent
Femoral Component	40	28.4	5851	32.8
Acetabular Component	29	20.6	3274	18.4
THR (Femoral/Acetabular)	15	10.6	1984	11.1
Cement Spacer	3	2.1	603	3.4
Removal of Prostheses	1	0.7	94	0.5
Reinsertion of Components			28	0.2
Bipolar Head and Femoral			7	0.0
Total Femoral			7	0.0
Saddle			1	0.0
N Major	**88**	**62.4**	**11849**	**66.5**
Head/Insert	46	32.6	4599	25.8
Head Only	6	4.3	901	5.1
Minor Components	1	0.7	294	1.6
Insert Only			183	1.0
Bipolar Only			2	0.0
Cement Only			1	0.0
Head/Neck			1	0.0
N Minor	**53**	**37.6**	**5981**	**33.5**
TOTAL	**141**	**100.0**	**17830**	**100.0**

Note: This table is restricted to revisions within 11.6 years for all groups to allow a time-matched comparison of revisions.
Note: Prostheses no longer used in 2023 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 Accolade II/Trident Tritanium (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 Accolade II/Trident Tritanium (Shell) Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cementless	141	4207
Hybrid (Femur Cemented)	0	1
Reverse Hybrid (Femur Cementless)	0	5
TOTAL	**141**	**4213**

TABLE 7

Revision Rates of Accolade II/Trident Tritanium (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 Accolade II/Trident Tritanium (Shell) Primary Total Conventional Hip Replacement by Bearing Surface

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	1	40
Ceramic/Non XLPE	1	1
Ceramic/XLPE	107	3422
Metal/XLPE	32	749
Unknown	0	1
TOTAL	**141**	**4213**

TABLE 8

Revision Rates of Accolade II/Trident Tritanium (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 Accolade II/Trident Tritanium (Shell) Primary Total Conventional Hip Replacement by Approach

Approach	N Revised	N Total
Anterior	29	996
Lateral	21	404
Posterior	90	2746
TOTAL	**140**	**4146**

Note: Excludes 67 procedures with no approach recorded

TABLE 9

Revision Rates of Primary Total Conventional Hip Replacement by State

This enables a state by state variation to be identified for the Accolade II/Trident Tritanium (Shell) 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 9: Revised Number of Primary Total Conventional Hip Replacement by State

Component	State	N Revised	N Total
Accolade II/Trident Tritanium (Shell)	NSW	35	1124
	VIC	31	932
	QLD	13	272
	WA	43	1340
	SA	11	312
	TAS	6	202
	ACT/NT	2	31
Other Total Conventional Hip	NSW	5172	156583
	VIC	4828	139749
	QLD	3778	94310
	WA	2503	61925
	SA	1814	49086
	TAS	446	17996
	ACT/NT	567	14679
TOTAL		**19249**	**538541**

Note: Prostheses no longer used in 2023 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

TABLE 10

Number of Revisions of Accolade II/Trident Tritanium (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 Accolade II/Trident Tritanium (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 2023 has a maximum of one year to be revised, whereas a primary procedure performed in 2021 has a maximum of three years to be revised.

Table 10: Number of Revisions of Accolade II/Trident Tritanium (Shell) Primary Total Conventional Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2012	0	1
2013	0	1
2014	1	30
2015	5	119
2016	16	258
2017	16	484
2018	20	402
2019	18	510
2020	19	584
2021	22	810
2022	20	669
2023	4	345
TOTAL	**141**	**4213**

TABLE 11

Revision Rates of Accolade II/Trident Tritanium (Shell) 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 Accolade II/Trident Tritanium (Shell) 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	Fixation
Femoral Stem						
Accolade II	67200027-67201140	132 DEGREE NECK ANGLE V40 FEMORAL STEM	NO	METAL	HA COATED	
Accolade II	67210027-67211140	127 DEGREE NECK ANGLE V40 FEMORAL STEM	NO	METAL	HA COATED	
Acetabular						
Trident/Tritanium (Shell)	5000344A-5000366H	TRITANIUM HEMISPHERICAL SOLID SHELL	NO	METAL		HIGHLY POROUS
Trident/Tritanium (Shell)	5020344A-5020366H	TRITANIUM HEMISPHERICAL CLUSTER HOLE SHELL	NO	METAL		HIGHLY POROUS
Trident/Tritanium (Shell)	5090254E-5090280J	TRITANIUM REVISION HEMISPHERICAL CLUSTER HOLE SHELL	NO	METAL		HIGHLY POROUS

Table 11: Revised Number of Accolade II/Trident Tritanium (Shell) Primary Total Conventional Hip Replacement by Catalogue Number Range

Femoral Stem Range	Acetabular Range	N Revised	N Total
67200027-67201140	5000344A-5000366H	2	43
	5020344A-5020366H	32	745
	5090254E-5090280J	1	21
67210027-67211140	5000344A-5000366H	7	204
	5020344A-5020366H	98	3165
	5090254E-5090280J	1	35
TOTAL		**141**	**4213**