

Trident II Tritanium (Shell) (dm) Total Conventional Hip Investigation

Note: This analysis compares the Trident II Tritanium (Shell) (dm) acetabular 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-2026>.

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 2025 are excluded from the comparator.

TABLE 1

Revision Rate of Primary Total Conventional Hip Replacement

The revision rate of the Trident II Tritanium (Shell) (dm) 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)
Trident II Tritanium (Shell) (dm)	317	16150	20370	1.56 (1.39, 1.74)
Other Total Conventional Hip	19384	552462	3602701	0.54 (0.53, 0.55)
TOTAL	19701	568612	3623071	0.54 (0.54, 0.55)

Note: Prostheses no longer used in 2025 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 Trident II Tritanium (Shell) (dm) 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
Trident II Tritanium (Shell) (dm)	1.9 (1.7, 2.2)	2.3 (2.1, 2.6)	2.7 (2.4, 3.2)	2.7 (2.4, 3.2)		
Other Total Conventional Hip	1.7 (1.7, 1.8)	2.1 (2.1, 2.2)	2.5 (2.4, 2.5)	2.7 (2.7, 2.8)	3.0 (3.0, 3.1)	3.3 (3.2, 3.3)

CPR	7 Yrs	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs
Trident II Tritanium (Shell) (dm)						
Other Total Conventional Hip	3.5 (3.5, 3.6)	3.8 (3.7, 3.9)	4.1 (4.0, 4.2)	4.4 (4.3, 4.5)	4.7 (4.6, 4.8)	5.1 (5.0, 5.2)

CPR	13 Yrs	14 Yrs	15 Yrs	16 Yrs	17 Yrs	18 Yrs
Trident II Tritanium (Shell) (dm)						
Other Total Conventional Hip	5.4 (5.3, 5.5)	5.8 (5.7, 5.9)	6.2 (6.1, 6.3)	6.6 (6.5, 6.7)	7.0 (6.8, 7.1)	7.3 (7.1, 7.5)

CPR	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
Trident II Tritanium (Shell) (dm)							
Other Total Conventional Hip	7.7 (7.5, 7.9)	8.0 (7.8, 8.2)	8.5 (8.3, 8.8)	9.0 (8.7, 9.4)	9.6 (9.1, 10.0)	9.6 (9.1, 10.1)	10.3 (9.4, 11.2)

Note: Prostheses no longer used in 2025 are excluded from the comparator. Procedures using metal/metal prostheses with head size larger than 32mm are excluded from the comparator.

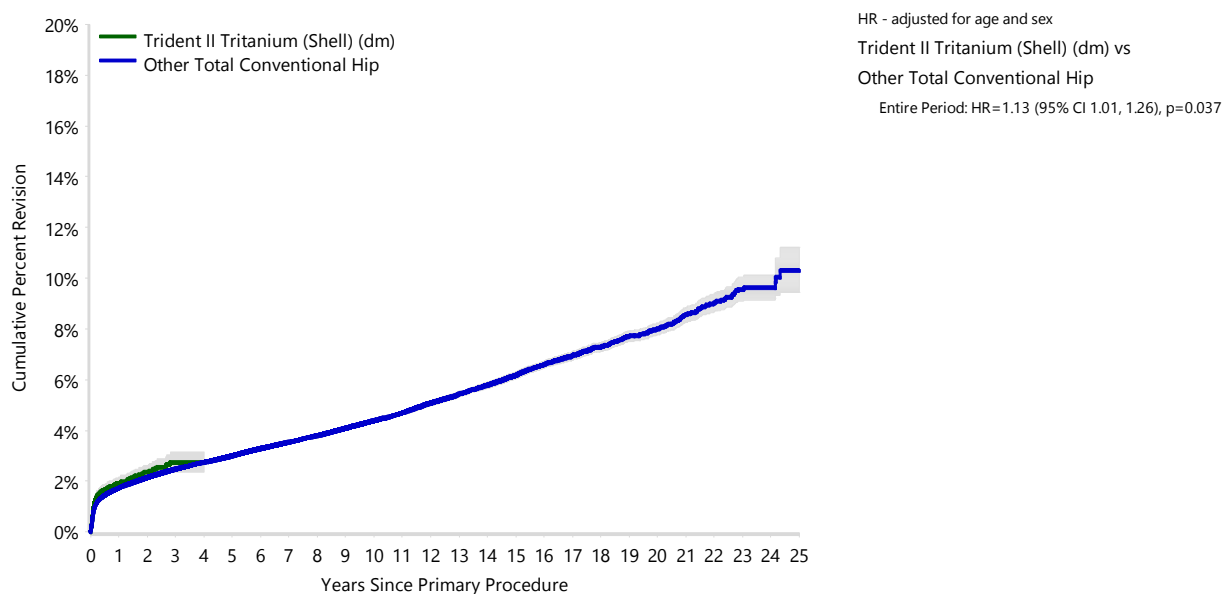
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The yearly cumulative percent revision of the Trident II Tritanium (Shell) (dm) 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
Trident II Tritanium (Shell) (dm)	16150	8451	3721	805	73	16	0	0
Other Total Conventional Hip	552462	493152	441712	390759	344316	299338	259516	220948

Number at Risk	8 Yrs	9 Yrs	10 Yrs	11 Yrs	12 Yrs	13 Yrs	14 Yrs	15 Yrs	16 Yrs
Trident II Tritanium (Shell) (dm)	0	0	0	0	0	0	0	0	0
Other Total Conventional Hip	185798	153739	124848	99575	79802	63343	49730	38033	28355

Number at Risk	17 Yrs	18 Yrs	19 Yrs	20 Yrs	21 Yrs	22 Yrs	23 Yrs	24 Yrs	25 Yrs
Trident II Tritanium (Shell) (dm)	0	0	0	0	0	0	0	0	0
Other Total Conventional Hip	20437	14638	10400	7396	4859	2863	1455	560	95

Note: Prostheses no longer used in 2025 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	Trident II Titanium (Shell) (dm)		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Osteoarthritis	250	78.9	16046	82.8
Fractured Neck Of Femur	39	12.3	1482	7.6
Osteonecrosis	16	5.0	828	4.3
Developmental Dysplasia	4	1.3	317	1.6
Rheumatoid Arthritis	4	1.3	197	1.0
Failed Internal Fixation	3	0.9	162	0.8
Tumour	1	0.3	156	0.8
Other Inflammatory Arthritis			102	0.5
Fracture/Dislocation			60	0.3
Other			21	0.1
Arthrodesis Takedown			13	0.1
TOTAL	317	100.0	19384	100.0

Note: Prostheses no longer used in 2025 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 5.8 Years)

Revision Diagnosis	Trident II Tritanium (Shell) (dm)			Other Total Conventional Hip		
	Number	% Primaries Revised	% Revisions	Number	% Primaries Revised	% Revisions
Infection	128	0.8	40.4	4412	0.8	28.8
Prosthesis Dislocation/Instability	63	0.4	19.9	3772	0.7	24.6
Fracture	84	0.5	26.5	3058	0.6	20.0
Loosening	25	0.2	7.9	2473	0.4	16.1
Leg Length Discrepancy	4	0.0	1.3	290	0.1	1.9
Pain	4	0.0	1.3	280	0.1	1.8
Malposition	3	0.0	0.9	238	0.0	1.6
Implant Breakage Acetabular Insert	2	0.0	0.6	94	0.0	0.6
Incorrect Sizing	1	0.0	0.3	91	0.0	0.6
Implant Breakage Stem				88	0.0	0.6
Lysis				58	0.0	0.4
Implant Breakage Acetabular				49	0.0	0.3
Tumour				36	0.0	0.2
Metal Related Pathology				35	0.0	0.2
Heterotopic Bone				24	0.0	0.2
Wear Head				24	0.0	0.2
Wear Acetabular Insert				18	0.0	0.1
Implant Breakage Head				12	0.0	0.1
Osteonecrosis				4	0.0	0.0
Synovitis				2	0.0	0.0
Wear Acetabulum				2	0.0	0.0
Progression Of Disease				1	0.0	0.0
Other	3	0.0	0.9	258	0.0	1.7
N Revision	317	2.0	100.0	15319	2.8	100.0
N Primary	16150			552462		

Note: This table is restricted to revisions within 5.8 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2025 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 Trident II Tritanium (Shell) (dm) 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.

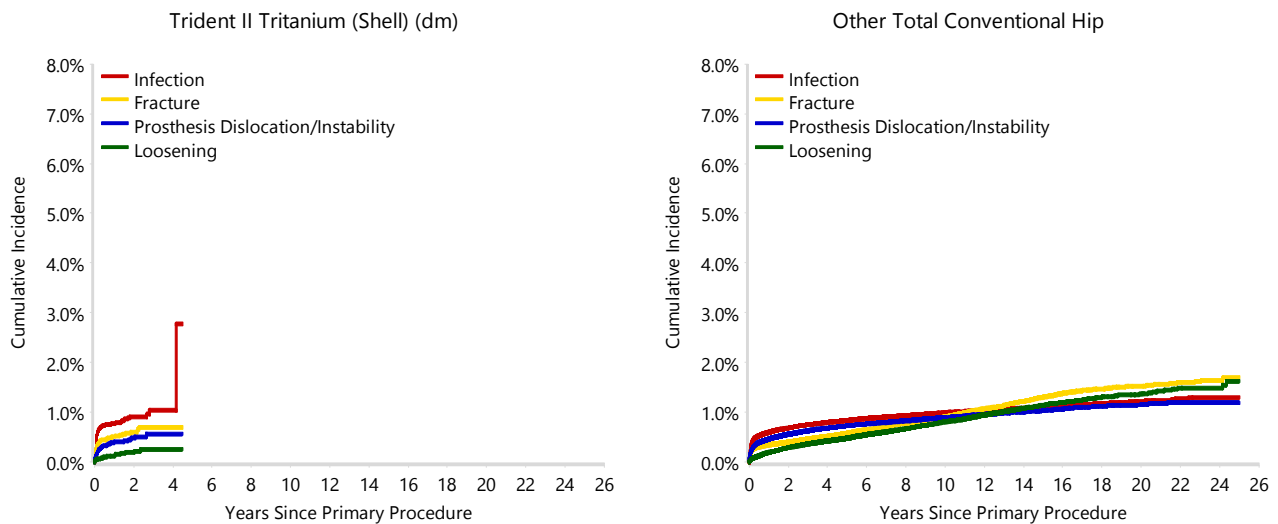
Figure 2: Cumulative Incidence Revision Diagnosis for Primary Total Conventional Hip Replacement

TABLE 5

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the Trident II Tritanium (Shell) (dm) 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 Trident II Tritanium (Shell) (dm) 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 5.8 Years)

Type of Revision	Trident II Tritanium (Shell) (dm)		Other Total Conventional Hip	
	Number	Percent	Number	Percent
Femoral Component	114	36.0	4689	30.6
Acetabular Component	29	9.1	2600	17.0
THR (Femoral/Acetabular)	17	5.4	1685	11.0
Cement Spacer	2	0.6	466	3.0
Removal of Prostheses			83	0.5
Reinsertion of Components			26	0.2
Total Femoral			9	0.1
Bipolar Head and Femoral			8	0.1
N Major	162	51.1	9566	62.4
Head/Insert	137	43.2	4559	29.8
Head Only	14	4.4	819	5.3
Minor Components	2	0.6	217	1.4
Insert Only	2	0.6	155	1.0
Bipolar Only			1	0.0
Cement Only			1	0.0
Head/Neck/Insert			1	0.0
N Minor	155	48.9	5753	37.6
TOTAL	317	100.0	15319	100.0

Note: This table is restricted to revisions within 5.8 years for all groups to allow a time-matched comparison of revisions.

Note: Prostheses no longer used in 2025 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 Trident II Tritanium (Shell) (dm) 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 Trident II Tritanium (Shell) (dm) Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total
Cemented	2	18
Cementless	170	8232
Hybrid (Femur Cemented)	145	7899
Reverse Hybrid (Femur Cementless)	0	1
TOTAL	317	16150

TABLE 7

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

Bearing Surface	N Revised	N Total
Ceramic/Ceramic	1	21
Ceramic/XLPE	212	11695
Metal/Non XLPE	1	26
Metal/XLPE	102	4355
Ceramicised Metal/XLPE	1	48
Unknown	0	5
TOTAL	317	16150

TABLE 8**Revision Rates of Trident II Tritanium (Shell) (dm) 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 Trident II Tritanium (Shell) (dm) Primary Total Conventional Hip Replacement by Approach

Approach	N Revised	N Total
Anterior	58	3599
Lateral	34	1144
Posterior	225	11377
TOTAL	317	16120

Note: Excludes 30 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 Trident II Tritanium (Shell) (dm) total conventional hip prosthesis 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
Trident II Tritanium (Shell) (dm)	NSW	97	4136
	VIC	58	3740
	QLD	91	4869
	WA	51	2245
	SA	15	767
	TAS	2	100
	ACT/NT	3	293
Other Total Conventional Hip	NSW	5410	162866
	VIC	4795	142818
	QLD	3877	99490
	WA	2459	62701
	SA	1872	51317
	TAS	437	18169
	ACT/NT	534	15101
TOTAL		19701	568612

Note: Prostheses no longer used in 2025 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 Trident II Tritanium (Shell) (dm) Primary Total Conventional Hip Replacement by Year of Implant**

This analysis details the number of prostheses reported each year to the Registry for the Trident II Tritanium (Shell) (dm) 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 2025 has a maximum of one year to be revised, whereas a primary procedure performed in 2023 has a maximum of three years to be revised.

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

Year of Implant	Number Revised	Total Number
2020	0	20
2021	4	61
2022	21	786
2023	92	3045
2024	86	4811
2025	114	7427
TOTAL	317	16150

TABLE 11

Revision Rates of Trident II Tritanium (Shell) (dm) 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 Trident II Tritanium (Shell) (dm) 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
Acetabular						
Trident II/Tritanium (Shell)	7000442A-7000466H	TRIDENT II TRITANIUM SOLIDBACK ACETABULAR SHELL	NO	METAL	HA COATED	HIGHLY POROUS
Trident II/Tritanium (Shell)	7020442A-7020466H	TRIDENT II TRITANIUM CLUSTERHOLE ACETABULAR SHELL	NO	METAL	HA COATED	HIGHLY POROUS
Trident II/Tritanium (Shell)	7090442A-7090472J	TRIDENT II TRITANIUM MULTIHOLE SHELL	NO			

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

Acetabular Range	N Revised	N Total
7000442A-7000466H	43	2387
7020442A-7020466H	262	13543
7090442A-7090472J	12	220
TOTAL	317	16150

TABLE 12

Revision Rates of Trident II Tritanium (Shell) (dm) 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 12: Revised Number of Trident II Tritanium (Shell) (dm) Primary Total Conventional Hip Replacement by Femoral Stem Component

Femoral Stem Component	N Revised	N Total
ACTIS	0	13
AMiStem H	0	3
AMiStem-P	0	1
Accolade II	152	7476
Arcos (cone body)	0	1
C-Stem AMT	1	5
CORAIL	5	203
CPCS	0	2
CPT	0	1
E2	1	4
Exeter	0	2
Exeter V40	118	6304
GMRS	0	11
Insignia	1	244
KAR	0	2
MP Reconstruction	0	1
Metafix	0	11
Modulus	0	1
Mutars	0	1
Optimys	1	24
Origin	0	2
Pantheon	0	1
Polarstem	1	47
Quadra-C	0	23
Quadra-P	0	1
Restoration	2	42
S-Rom	0	2
SPS Evolution	0	2
Secur-Fit	7	142
Secur-Fit Plus	1	2
Short Exeter V40	27	1531
Taper Fit	0	7
Taperloc	0	1
Taperloc Microplasty	0	1
VerSys	0	1
X-Acta	0	7
twinSys (cless)	0	18
twinSys (ctd)	0	10
TOTAL	317	16150