Australian Government

Department of Health and Ageing
Therapeutic Goods Administration

[redacted]
ESKA Australia
Suite 32 A-B 2-6 Chaplin Drive
LANE COVE NSW 2066

Dear [redacted]

Re: TGA Review of orthopaedic implants which have been identified as having higher than expected revision rates:

ESKA Adapter (cementless) Femoral Stem Prosthesis

I bring to your attention the 2010 Annual Report of the National Joint Replacement Registry of the Australian Orthopaedic Association (The Report). The Report can be downloaded from http://www.dmac.adelaide.edu.au/aoanjrr/index.jsp

The National Joint Replacement Registry of the Australian Orthopaedics Association (The Registry) has developed a three stage process to identify prostheses that have a higher than anticipated revision rate compared to other prostheses of the same type. The process is explained in pages 142-143 of the Report. The implants that have been identified as having a higher than anticipated revision rates are listed in Tables IP1-IP21 (pages 144-160). Further information about the implants appears in Figures IP1-IP12 (pages 144-162). The Registry has also provided a discussion of the revision rates of implants that have been identified for the first time in 2010.

Joint replacement surgery is associated with significant morbidity and a low (but not negligible) mortality. Failure of an implant leading to revision exposes the patient to joint replacement surgery which may have been unnecessary. Therefore revision surgery is considered to be an adverse event. It follows that an implant that is experiencing unusually high rates of revision is also a matter of concern.

The Registry has identified that the rate of revision of the Adapter (cementless) Femoral Stem Prosthesis is significantly higher than that of similar implants in the Australian market. For your convenience, I have attached a detailed report from the National Joint Replacement Registry about the implant. Given this evidence of higher than average revision rates for this implant, and the safety implications of revision surgery, please provide the following information:

1- A summary report of the number and types of problems, complaints and adverse events that ESKA Australia and the Manufacturer have received in relation to the implant. The report should be in the form of a table with a count of reports against each type of problem, complaint or adverse event.

2- The number of implants that have been supplied and the number of revisions associated with these implants that have been reported to ESKA Australia. Please provide both Australian figures and world-wide figures.

3- Your own estimate of the revision rate for the implant – (for example: the 5 year revision rate, the 10 year revision rate, or the revision rate in number of revisions per 100 component years) and an explanation of how this revision rate was estimated.

4- Details and results of any clinical trials, clinical studies, or overseas registry information that may be available for the implant

5- An explanation of the higher than average revision rate observed by the Australian National Hip Replacement Register for the implant.

6- A detailed description of design changes or any other actions that may have been undertaken to improve the seemingly poor early performance of the product in relation to early revision. Please outline how the changes reduce the risk of early revision supporting your argument with clinical evidence, if available.

7- An outline of the perceived benefits of using the Adapter (cementless) Femoral Stem Prosthesis over other similar products, and how these benefits compensate for the apparently increased risk of early revision.

8- Any other information about the implant that you wish the TGA to consider in addition to the data from The Registry.

The information that you provide will be reviewed by the Orthopaedic Expert Working Group established by the Medical Device Evaluation Committee (now the Advisory Committee on Medical Devices, ACMD) to advice the TGA. The Working Group will advise ACMD and the TGA whether the revision rate of the product is unacceptable, taking into consideration the reasons for revision and special needs for the product and any other information that you provide. If the information requested is not made available, the Working Group may need to make their recommendation based on the National Joint Replacement Registry data alone. The advice provided by the Working Group will provide a basis for the TGA considering whether any regulatory action is required.

Your response should be provided by Friday 22 October 2010. Please note that the Orthopaedic Expert Working Group will meet soon after, therefore there is very little scope for extension of this deadline. Do not hesitate to call me to discuss any aspect of this request.

Yours sincerely

[redacted]
Chief Biomaterials Scientist
Director, Biomaterials and Engineering
Office of Laboratories and Scientific Services

[redacted]

29 September 2010

Facsimile

Date:	29 September 2010	**Total pages:**	
TO:	ESKA Australia	**Telephone:**	[redacted]
Attention:	[redacted]	**Facsimile:**	[redacted]
Regarding:	TGA Review of the 2010 NJRR Report		
FROM:	[redacted]	**Telephone:**	[redacted]
Branch/Div.:	Office of Laboratories and Scientific Services	**Facsimile:**	

If you do not receive all pages, please telephone the sender immediately

MESSAGE:

A letter requiring prompt attention follows. A printed copy will follow by mail

Adaptor (cementless) Total Conventional Hip Femoral Prosthesis

This analysis compares the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis with all Other Total Conventional Hip prostheses. This Prosthesis has been identified as having a significantly higher revision rate.

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, http://www.dmac.adelaide.edu.au/aoanjrr/publications.jsp.

TABLE 1

Revision Rate of Primary Total Conventional Hip Replacement

The ***Revision Rate*** of the Adaptor (cementless) Total Conventional Hip Femoral 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)
Adapter (cementless)	23	567	1092	2.11 (1.34, 3.16)
Other Total Conventional Hip	5054	170537	651226	0.78 (0.75, 0.80)
TOTAL	5077	171104	652317	0.78 (0.76, 0.80)

TABLE 2

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The ***Yearly Cumulative Percent Revision*** of the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis is compared to all Other Total Conventional Hip prostheses.

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

CPR	1 Yr	3 Yrs	5 Yrs	7 Yrs	9 Yrs
Adapter (cementless)	2.7 (1.6, 4.5)	5.4 (3.5, 8.3)			
Other Total Conventional Hip	1.5 (1.5, 1.6)	2.7 (2.6, 2.8)	3.5 (3.4, 3.6)	4.4 (4.3, 4.5)	5.4 (5.1, 5.7)

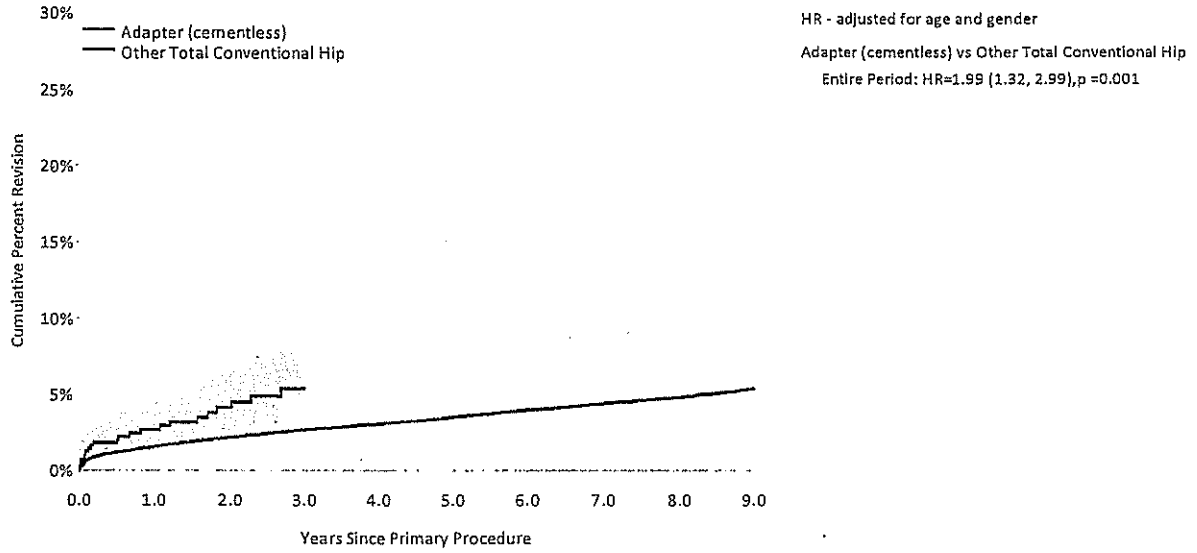
FIGURE 1

Yearly Cumulative Percent Revision of Primary Total Conventional Hip Replacement

The ***Yearly Cumulative Percent Revision*** of the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis is compared to all Other Total Conventional Hip prostheses. In addition, Hazard Ratios are also 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 Yrs	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs	8 Yrs	9 Yrs
Adapter (cementless)	567	396	265	137	16	0	0	0	0	0
Other Total Conventional Hip	170537	142264	117871	96114	75956	57166	40037	24821	11582	2968

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

	Adapter (cementless)		Other Total Conventional Hip	
Primary Diagnosis	Number	Percent	Number	Percent
Osteoarthritis	22	95.7	4262	84.3
Avascular Necrosis			253	5.0
Fractured Neck Of Femur	1	4.3	249	4.9
Rheumatoid Arthritis			96	1.9
Developmental Dysplasia			87	1.7
Failed Internal Fixation			32	0.6
Tumour			32	0.6
Other Inflammatory Arthritis			29	0.6
Fracture/Dislocation			7	0.1
Arthrodesis Takedown			5	0.1
Other			2	0.0
TOTAL	23	100.0	5054	100.0

TABLE 4

Revision Rates of Adaptor (cementless) 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 4: Revision Rates of Adapter (cementless) Primary Total Conventional Hip Replacement by Fixation

Fixation	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Cemented	0	1	3	0.00 (0.00, 115.0)
Cementless	23	550	1071	2.15 (1.36, 3.22)
Hybrid	0	16	18	0.00 (0.00, 21.04)
TOTAL	23	567	1092	2.11 (1.34, 3.16)

TABLE 5

Revision Rates of* Adaptor (cementless) *Primary* Total Conventional Hip *Replacement by Bearing Surface.

This analysis is provided as some prostheses are combined with a variety of different bearing surfaces. All bearing surfaces used with this Prosthesis are listed.

Table 5: Revision Rates of Adapter (cementless) Primary Total Conventional Hip Replacement by Bearing Surface

Bearing Surface	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Ceramic/Ceramic	2	38	78	2.56 (0.31, 9.26)
Ceramic/Polyethylene	1	53	99	1.01 (0.03, 5.65)
Ceramic/Modified Polyethylene	0	11	2	0.00 (0.00, 219.1)
Metal/Metal	17	356	759	2.24 (1.30, 3.59)
Metal/Polyethylene	3	105	150	2.00 (0.41, 5.84)
Metal/Modified Polyethylene	0	4	4	0.00 (0.00, 83.74)
TOTAL	23	567	1092	2.11 (1.34, 3.16)

TABLE 6

Type of Revision Performed for Primary Total Conventional Hip Replacement

This analysis identifies the components used in the revision of the Adaptor (cementless) Total Conventional Hip Femoral 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 Adaptor (cementless) Total Conventional Hip Femoral Prosthesis compared to all Other Total Conventional Hip prostheses.

Table 6: Primary Total Conventional Hip Replacement - Type of Revision

	Adapter (cementless)		Other Total Conventional Hip	
Revision Type	**Number**	**Percent**	**Number**	**Percent**
Femoral Only	6	26.1	1482	29.3
Acetabular Only	5	21.7	1260	24.9
THR (Femoral/Acetabular)	2	8.7	625	12.4
Cement Spacer	1	4.3	244	4.8
Removal of Prostheses			41	0.8
Reinsertion of Components			6	0.1
Bipolar Head and Femoral			2	0.0
Saddle			2	0.0
N Major	**14**	**60.9**	**3662**	**72.5**
Head/Insert	5	21.7	922	18.2
Head Only	1	4.3	285	5.6
Minor Components			82	1.6
Insert Only	1	4.3	70	1.4
Head/Neck	2	8.7	30	0.6
Neck Only			2	0.0
Neck/Insert			1	0.0
N Minor	**9**	**39.1**	**1392**	**27.5**
TOTAL	**23**	**100.0**	**5054**	**100.0**

TABLE 7

Reason for Revision of Primary Total Conventional Hip Replacement

This is reported in two ways; a percentage of all revisions and also as a percentage of all primary procedures.

This analysis includes a comparison of reasons for revision to all Other Total Conventional Hip prostheses.

This analysis is undertaken to identify if there are differences in the reasons for revision and the number of revisions performed for those reasons between the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis and all Other Total Conventional Hip prostheses.

Table 7: Primary Total Conventional Hip Replacement - Reason for Revision

	Adapter (cementless)			Other Total Conventional Hip		
Revision Diagnosis	Number	% Revision	% Primary	Number	% Revision	% Primary
Loosening/Lysis	5	21.7	0.9	1514	30.0	0.9
Prosthesis Dislocation	5	21.7	0.9	1395	27.6	0.8
Infection	3	13.0	0.5	843	16.7	0.5
Fracture	2	8.7	0.4	742	14.7	0.4
Pain	4	17.4	0.7	100	2.0	0.1
Other				67	1.3	0.0
Leg Length Discrepancy	1	4.3	0.2	63	1.2	0.0
Metal Sensitivity	1	4.3	0.2	61	1.2	0.0
Malposition				54	1.1	0.0
Wear Acetabulum	1	4.3	0.2	51	1.0	0.0
Implant Breakage Stem				35	0.7	0.0
Implant Breakage Acetabular	1	4.3	0.2	32	0.6	0.0
Incorrect Sizing				29	0.6	0.0
Instability				28	0.6	0.0
Implant Breakage Head				20	0.4	0.0
Heterotopic Bone				8	0.2	0.0
Tumour				8	0.2	0.0
Avascular Necrosis				2	0.0	0.0
Synovitis				2	0.0	0.0
N Revision	**23**	**100.0**	**4.1**	**5054**	**100.0**	**3.0**
N Primary	**567**			**170537**		

FIGURE 2

Revision Diagnosis Cumulative Incidence by Time to Revision for 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 Adaptor (cementless) 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

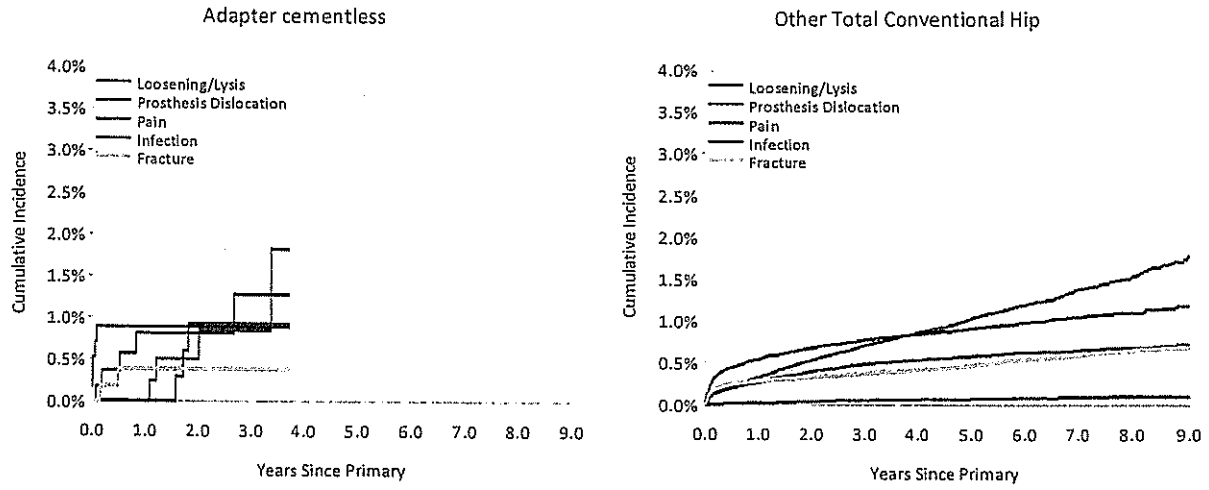


TABLE 8

Revision Rates of Adaptor (cementless) Primary Total Conventional Hip Replacement by Hospital

This table details the rates of revision in each of the individual hospitals in which the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis was used. The hospitals are identified by number only.

The purpose of this analysis is to determine if the higher than anticipated rate of revision has widespread distribution between hospitals. 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 hospitals 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: Revision Rates of Adapter (cementless) Primary Total Conventional Hip Replacement by Hospital

Hospital Number	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
1	0	5	5	0.00 (0.00, 69.02)
2	0	26	16	0.00 (0.00, 23.74)
3	0	1	1	0.00 (0.00, 561.4)
4	0	4	2	0.00 (0.00, 172.1)
5	0	1	2	0.00 (0.00, 221.2)
6	0	2	7	0.00 (0.00, 53.30)
7	0	5	8	0.00 (0.00, 43.42)
8	1	12	39	2.54 (0.06, 14.16)
9	2	51	93	2.15 (0.26, 7.75)
10	3	77	203	1.48 (0.31, 4.33)
11	0	1	0	0.00 (0.00, 1773)
12	0	1	0	0.00 (0.00, 3963)
13	0	5	14	0.00 (0.00, 25.83)
14	0	11	6	0.00 (0.00, 61.95)
15	3	57	121	2.49 (0.51, 7.26)
16	0	1	4	0.00 (0.00, 86.76)
17	1	8	10	9.66 (0.24, 53.82)
18	0	2	1	0.00 (0.00, 251.4)
19	0	3	5	0.00 (0.00, 69.49)
20	1	8	16	6.38 (0.16, 35.55)
21	5	152	304	1.64 (0.53, 3.84)
22	0	1	1	0.00 (0.00, 456.7)
23	1	8	4	25.94 (0.66, 144.5)
24	0	1	3	0.00 (0.00, 120.2)
25	0	2	1	0.00 (0.00, 276.1)
26	0	2	3	0.00 (0.00, 129.3)
27	0	2	6	0.00 (0.00, 64.71)
28	0	1	2	0.00 (0.00, 243.6)
29	0	1	2	0.00 (0.00, 156.3)
30	0	15	6	0.00 (0.00, 62.38)
31	3	73	132	2.27 (0.47, 6.63)
32	3	24	68	4.42 (0.91, 12.93)
33	0	3	3	0.00 (0.00, 105.7)
34	0	1	2	0.00 (0.00, 158.5)
TOTAL	**23**	**567**	**1092**	**2.11 (1.34, 3.16)**

TABLE 9

Revision Rates of Primary Total Conventional Hip Replacement by State

This enables a state by state variation to be identified for the Adaptor (cementless) Total Conventional Hip Femoral Prosthesis and provides the comparative data for each of the states for all Other Total Conventional Hip prostheses.

This analysis is undertaken for similar reasons as those outlined above for Table 8.

Table 9: Revision Rates of Primary Total Conventional Hip Replacement by State

Component	State	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
Adapter (cementless)	NSW	14	308	575	2.44 (1.33, 4.09)
Adapter (cementless)	VIC	3	74	141	2.13 (0.44, 6.22)
Adapter (cementless)	QLD	1	19	55	1.83 (0.05, 10.17)
Adapter (cementless)	WA	0	32	20	0.00 (0.00, 18.44)
Adapter (cementless)	SA	0	5	5	0.00 (0.00, 69.02)
Adapter (cementless)	TAS	5	128	296	1.69 (0.55, 3.95)
Adapter (cementless)	ACT/NT	0	1	0	0.00 (0.00, 1773)
Other Total Conventional Hip	NSW	1405	50347	180311	0.78 (0.74, 0.82)
Other Total Conventional Hip	VIC	1378	46239	176185	0.78 (0.74, 0.82)
Other Total Conventional Hip	QLD	867	27407	105373	0.82 (0.77, 0.88)
Other Total Conventional Hip	WA	647	18985	76117	0.85 (0.79, 0.92)
Other Total Conventional Hip	SA	462	17571	74846	0.62 (0.56, 0.68)
Other Total Conventional Hip	TAS	163	6120	24233	0.67 (0.57, 0.78)
Other Total Conventional Hip	ACT/NT	132	3868	14161	0.93 (0.78, 1.11)
TOTAL		**5077**	**171104**	**652317**	**0.78 (0.76, 0.80)**

TABLE 10

Number of Revisions of Adaptor (cementless) Primary Total Conventional Hip Replacement by Year of Implant

This analysis details the number of prostheses reported each year to the Registry for the Adaptor (cementless) 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 2009 has a maximum of one year to be revised, whereas a primary performed in 2007 has a maximum of three years to be revised.

Table 10: Number of Revisions of Adapter (cementless) Primary Total Conventional Hip Replacement by Year of Implant

Year of Implant	Number Revised	Total Number
2005	1	19
2006	9	140
2007	6	131
2008	4	121
2009	3	156
TOTAL	**23**	**567**

TABLE 11

Revision rates of Adaptor (cementless) 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 Adaptor (cementless) femoral prosthesis.

This analysis has been undertaken to determine if the revision rate varies according to the catalogue number range.

Table 11: Revision Rates of Adapter (cementless) Primary Total Conventional Hip Replacement by Catalogue Number Range

	Catalogue Range	Catalogue Description
Femoral Stem		
Adapter (cementless)	11090302-11090373	ADAPTER CEMENTLESS COLLARLESS
Adapter (cementless)	11099012-11099044	HIP STEM CEMENTLESS TiNB-C COLLARLESS

Femoral Stem Range	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
11090302-11090373	22	522	1061	2.07 (1.30, 3.14)
11099012-11099044	1	45	31	3.27 (0.08, 18.23)
TOTAL	**23**	**567**	**1092**	**2.11 (1.34, 3.16)**

TABLE 12

Revision rates of Adaptor (cementless) 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: Revision Rates of Adapter (cementless) Primary Total Conventional Hip Replacement by Acetabular Component

Acetabular Component	N Revised	N Total	Obs. Years	Revisions/100 Obs. Yrs (95% CI)
2000	0	2	6	0.00 (0.00, 61.89)
2000 Plus	2	55	121	1.65 (0.20, 5.97)
Allofit	0	13	2	0.00 (0.00, 184.6)
Bionik	21	489	948	2.22 (1.37, 3.39)
Eska Cup	0	1	3	0.00 (0.00, 121.1)
R3	0	1	1	0.00 (0.00, 561.4)
Trabecular Metal Shell	0	5	10	0.00 (0.00, 37.95)
Trilogy	0	1	2	0.00 (0.00, 201.1)
TOTAL	**23**	**567**	**1092**	**2.11 (1.34, 3.16)**