



THE NEW ZEALAND JOINT REGISTRY

TWENTY-THREE YEAR REPORT
JANUARY 1999 TO DECEMBER 2021

23

YEARS



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EDITORIAL COMMENT

The Registry Management Committee is pleased to present the twenty-three-year report of the New Zealand Orthopaedic Association's Joint Registry.

In this year's report the format of previous years has been followed such that each arthroplasty section is self-contained. Statistical notes are presented in the first chapter.

The total number of registered joint arthroplasties at 31st of December 2021 was 372,444, which had been performed on 245,460 individual patients, of which 62,840 (25.6%) have now died during the twenty-three-year period.

The number of observed component years (ocys) contained within the Registry is now over two million. The increase of 24,043 registered joints for 2021 exceeds the 22,394 and 22,125 performed in 2019 and 2020 respectively.

The mean BMIs were 31.26 and 29.1 kg/m² for knees and hips respectively but significant numbers of morbidly obese (BMI>40) people received arthroplasties.

There are large numbers of revision procedures registered, for which the primary arthroplasty is lacking. In most cases this is explained by the primary procedure having pre-dated the registry. As for previous years, analyses of revision data reported here have been confined to primary registered arthroplasties.

Ethnicity

Ethnicity data has been reported separately in the annual NZJR report this year for the first time. The 1999-2020 NZJR data has been analysed in detail for Māori patients undergoing primary hip and primary knee replacement and the detailed results presented at the NZOA ASM 2022. NZJR data was cross referenced with MOH data for ethnicity and NZ census data was used as the denominator data for utilization. The key findings were:

From 1999-2000 Māori had lower utilisation for THA and have also had lower utilisation rates for THA for the duration of the registry, apart from the time period 2005-2009. There has been no improvement in utilisation rates for Māori patients over time.

Revision rates for Māori were similar to non-Māori for THA, whereas revision rates for Māori patients having TKA were slightly higher but not statistically significant when controlled for variables (age, sex, BMI).

PROMS data are similar for Māori patients with differences noted less than the minimally clinically important difference levels.

The reasons for under-utilization were not investigated in the study and require further investigation.

Rapid review of the raw ethnicity data for the other joint replacements suggests similar under-utilization for uni-knee, shoulder, ankle and elbow replacement. Further analysis of utilization and revision rates for other joints would be appropriate.

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Hip Arthroplasty

With the introduction of the new data forms in 2020, Hemiarthroplasty was added as a sub type of primary hip arthroplasty. There are 164,363 conventional total hip arthroplasties with an overall revision rate of 0.65 per 100 ocys (95% confidence interval (CI): 0.63-0.66) with a 20-year prosthesis survival of 85.91% (cemented 85.01%; uncemented 86.40% and hybrid 86.25%).

More females than males received a hip replacement (53.59% vs 46.41%), with a slightly higher mean age (68.57 vs 65.89 years), but a very wide range for both (13 to 101 yrs.) Most report no previous surgery (96.1%) and a diagnosis of osteoarthritis (88.1%). The posterior approach is slightly more popular this year than last (72.7% vs 67.3%), while the percentage of patients operated on through a lateral approach decreased slightly (23.5% vs 25.3%).

Fully cemented hip replacement has fallen from 14% in 2012 to approximately 5% in the last 2 years.

The ceramic on polyethylene bearing surface continues to increase in popularity rising from 42% of the total in 2017 to 54% in 2021. This is mainly at the expense of metal on polyethylene. Increasing confidence in the long-term results of cross-linked polyethylene likely accounts for the slow decrease in the use of ceramic-on-ceramic as a bearing surface since 2011.

The most popular head size overall remains 32mm, although the use of 36mm heads has increased since 2019, again reflecting increased confidence with crosslinked polyethylene when used to manufacture thinner liners than in the past.

Interestingly, there has been a resurgence of metal-on-metal articulations since 2019, with 97 hips being added in 2021. The use of cross-linked polyethylene remains the dominant choice again accounting for in excess of 97% of all polyethylene used.

Some 2,581 patients in the Registry are aged less than 40 years (1.57%). This age group has the highest revision rate, at 0.97 per 100 component years.

Fixation in the under 40 and 40-54 age groups remains controversial, with cemented arthroplasty showing the highest revision rates 1.44 and 1.94/100-component years respectively, hybrid and uncemented results in this group are similar.

With respect to Total Hip Prostheses Combinations, there were 254 combinations of prostheses used in 2021 where there is data for at least 50 primary registered arthroplasties.



"The total number of registered joint arthroplasties at 31st of December 2021 was **372,444**, which had been performed on **245,460** individual patients, of which **62,840** (25.6) have now died during the twenty-three year period. "

They are presented sorted on revision rate, as well as categorised according to fixation method.

The Corail/Pinnacle combination was the most popular in 2021, with 3,153 primary arthroplasties, while the Exeter V40/Trident combination was used in 2,275 primary arthroplasties. Both have revision rates well below the New Zealand mean, 0.56 and 0.40/100 ocys respectively.

Resurfacing hip arthroplasty

The number of resurfacing arthroplasties was 77 in 2021, lower than the 122 reported in 2020. The revision rate has again fallen from a rate of 1.06/100 ocys (95% CI: 0.90 – 1.24) in 2018, to 0.87/100 ocys (95% CI: 0.74- 1.018) in 2019.

Knee Arthroplasty

A total of 135,698 conventional total knee arthroplasties have been registered totalling 1,039,769 ocys with the overall revision rate 0.47/100 ocys, (95% CI: 0.45-0.48) and the excellent 22-year survival of 91.6%. The number of TKA's implanted per year was slightly reduced, with 8,597 implanted in 2021, more than the 8,378 and the 8,135 implanted in 2019 and 2020 respectively.

There are 46 different knee prostheses in the Registry that have a minimum of 50 registrations. The Triathlon remains the most popular prosthesis in 2021, with the Genesis II holding second place. Calculation of revision rates for individual prostheses with a minimum of 50 arthroplasties shows that among the prostheses registered in bigger numbers, the Duracon, although no longer implanted, has the lowest revision rate of 0.325/100 ocys.

The Triathlon has the biggest number of registrations at 30,777 with 184,755 ocys and a revision rate of 0.40/100 ocys.

It is important to note that the use of revisions per 100 component years as an outcome measure will tend to disadvantage newer prostheses such as the Persona, as revision for infection occurs more commonly in the first- year post implantation.

Although fully uncemented knee arthroplasty represents just 8% of all primary knee arthroplasties, it has a significantly higher revision rate than either fully cemented or hybrid in which the tibial component is cemented and the femoral component uncemented.

In the last three years there has been a small increase in the percentage use of fully uncemented TKA prostheses, reversing the previous trend. The KM curves for the three types of fixation show that the uncemented curve continues to steeply diverge from the other two. Similar to other registry findings, analysis suggests that the tibial component remains the limiting factor in uncemented TKA replacement.

The analyses comparing revision rates and survival of fixed versus mobile bearing knees continue to show that there is similar longer- term survival for both versions.

Again, this year separate analyses for cruciate retaining (CR) versus posterior stabilised (PS) knee prostheses demonstrate that overall, there are significantly higher revision rates for posterior stabilised prostheses. This is also evident with KM survival graphs and seems to hold true across almost all brands that have both PS and CR versions.

There are 811 registered patellofemoral prostheses, with 65 added in 2021. There have been 92 revisions. The revision rate of 1.91/100 ocys is nearly four times that for total knee arthroplasty. In the majority of cases, patellofemoral arthroplasties are revised to a total knee arthroplasty.

Again, this year revision rate tables and survival curves are included for the five different BMI groupings and like hip arthroplasty, the morbidly obese (BMI > 40) group have statistically significant poorer prosthesis survival.

Unicompartmental knee arthroplasty

There are 15,878 registered primary unicompartmental prostheses with a total of 119,851 ocys, a mean revision rate of 1.15/100 ocys and a 21- year survival of 75%. Unexplained pain remains the most common listed reason for revision. The updated data collection forms which were implemented in in 2020, have expanded options for reasons for revision. It is expected that this, along with increased surgeon vigilance, will continue to improve the diagnostic accuracy of reason for revision surgery.

There were 1,148 registrations in 2021, fewer than the 1,245 registrations in 2020.

Once again, the Oxford uncemented prosthesis was very dominant, accounting for 42% of the unicompartmental prostheses implanted in 2021.

The revision rate is 0.79/100 ocys for the medial Oxford UKR's and the lateral Oxford UKR's have a revision rate of 1.94/100 ocys. The Zimmer unicompartmental prosthesis has a lower rate of 0.59/100 ocys.

The overall revision rate is 1.14/100 ocys, however surgeons who perform less than 10 UKR's per year have a significantly higher revision rate – 1.33/100 ocys compared to surgeons doing 10 or more procedures 1.00/100 ocys. The rate of revision is 2.4-fold the rate for total knee arthroplasty. Despite this, patients consistently report superior Oxford scores at 5Y, 10Y and 15Y post- surgery.

Ankle arthroplasty

There are 2,016 primary registered ankle prostheses with a total of 14144 ocys, a mean revision rate of 1.59/100 ocys and an 18-year survival of 78.3%. The four implants that are currently in use have remained the same since 2017.

There were 139 primary ankle arthroplasties registered in 2021.

Shoulder arthroplasty

There are 13,816 registered primary shoulder arthroplasties, with a total of 81,601 ocys. An additional 1,198 primary shoulder replacements have been performed in 2021, compared with 1,187 in 2020. Reverse arthroplasty remains the predominant implant in 2021, now representing 74% of all shoulder arthroplasties performed. The percentage decline in anatomic shoulder replacement continues, but it is deceptive, as the actual number of total shoulder replacements has been relatively stable over the last 10 years. The percentage decline represents the increase in reverse shoulder replacement. The 10- year survival of all shoulder prostheses is 92.0%, whilst the 20- year revision free survival is 85.6%.

The revision rate of 0.91/100 ocys for primary shoulder arthroplasty remains steady, as do the revision rates for total (0.95) and reverse arthroplasty (0.70). 1,108 revision cases have been performed, an increase of 101 on the previous year. 5% of all shoulder arthroplasties have undergone revision surgery. Pain remains one of the major reasons for revision. Although reverse shoulder arthroplasty has increased revision rates compared to total shoulder replacement during the first two years, reverse arthroplasty outperforms total shoulder replacement with a ten- year survival of 96% compared to a rate of 92% for total shoulder replacement. Partial resurfacing and total resurfacing have been removed as a separate category in the report and are now incorporated in the total shoulder and hemiarthroplasty categories

Arthroplasties utilising uncemented glenoids continue to show a 3-fold revision rate compared to those having cemented glenoid components. Average Oxford scores remain unchanged from last year's report. There is an improvement in scores from 6 months to 5 years, but then the scores stabilise at 10 years. The initial four-point difference in scores for total shoulder and reverse shoulder decreases at 5 years, but the total shoulder scores remain 2.5 points higher at 5 years. An Oxford score of less than 27 results in a seven- fold increase in risk of revision compared to those with a score of 34 or greater.

Elbow arthroplasty

There are 721 registered primary elbow prostheses with an overall revision rate of 1.08/100 ocys.

There were 57 primary elbow prostheses registered in 2021, an increase compared to the previous year (39). The diagnosis of rheumatoid arthritis has decreased, and trauma has increased as an indication for elbow replacement.

In line with established data, the revision rate for younger males is higher.

The Zimmer Nexel is a relatively new elbow prosthesis. With a cumulative total of 139, the revision rate of the Nexel is 1.76/100 ocys which is an increase compared to the previous year 0.88/100 ocys. The Coonrad-Morrey with a cumulative total of 348 has an overall revision rate of 0.61/100 ocys. In light of this and the recent publication by Morrey et al ("Unexpected high early failure rate of the Nexel total elbow arthroplasty" JSES Int 2022 May 6;6(4):690-695), the ongoing performance of this new elbow prosthesis should be observed closely.

Deep Infection

We have compared the deep infection revision rates within six months of the arthroplasty for primary hip and knee arthroplasty against the theatre environment. Six months has been chosen, as infection within this time period is highly likely to have been introduced at the time of surgery.

The registry data continues to show an increased rate of infection when exhaust suits and laminar flow ventilation is used. This data needs to continue to be interpreted with caution. The data regarding suit use is likely to be accurate; experimental evidence has supported the observation that exhaust suits are not effective.

Data on use of laminar flow is likely to be inaccurate with many surgeons unsure of the status of ventilation in the theatres used.

The Registry intends to record the status of all theatres used and have the theatre listed on the data capture form to improve the accuracy of this over time

Oxford 12 Questionnaire

Six- month, five, ten, fifteen and twenty- year analyses of the individual score categories for primary hip and knee arthroplasties continue to demonstrate that the six-month score is indicative of the longer-term outcome.

It is noteworthy that the 15- year scores still have a similar high percentage of excellent/good outcomes as the 6- month, five- and ten-year outcomes.

As noted in previous years, the statistically significant relationship between the six- month, five -and ten - year scores and revision within two years of the scoring date for primary hips, knees (including unicompartmental) and shoulders (six months and five years only) has again been demonstrated.



With the very large number of recorded six-month Oxford hip and knee scores the score groupings can be further broken down to demonstrate an even more convincing relationship between score and risk of revision within two years.

Once again analyses of hip and knee six month post first revision arthroplasty questionnaire data has been undertaken and it demonstrates a similar relationship between the Oxford score at six months and the second revision within two years.

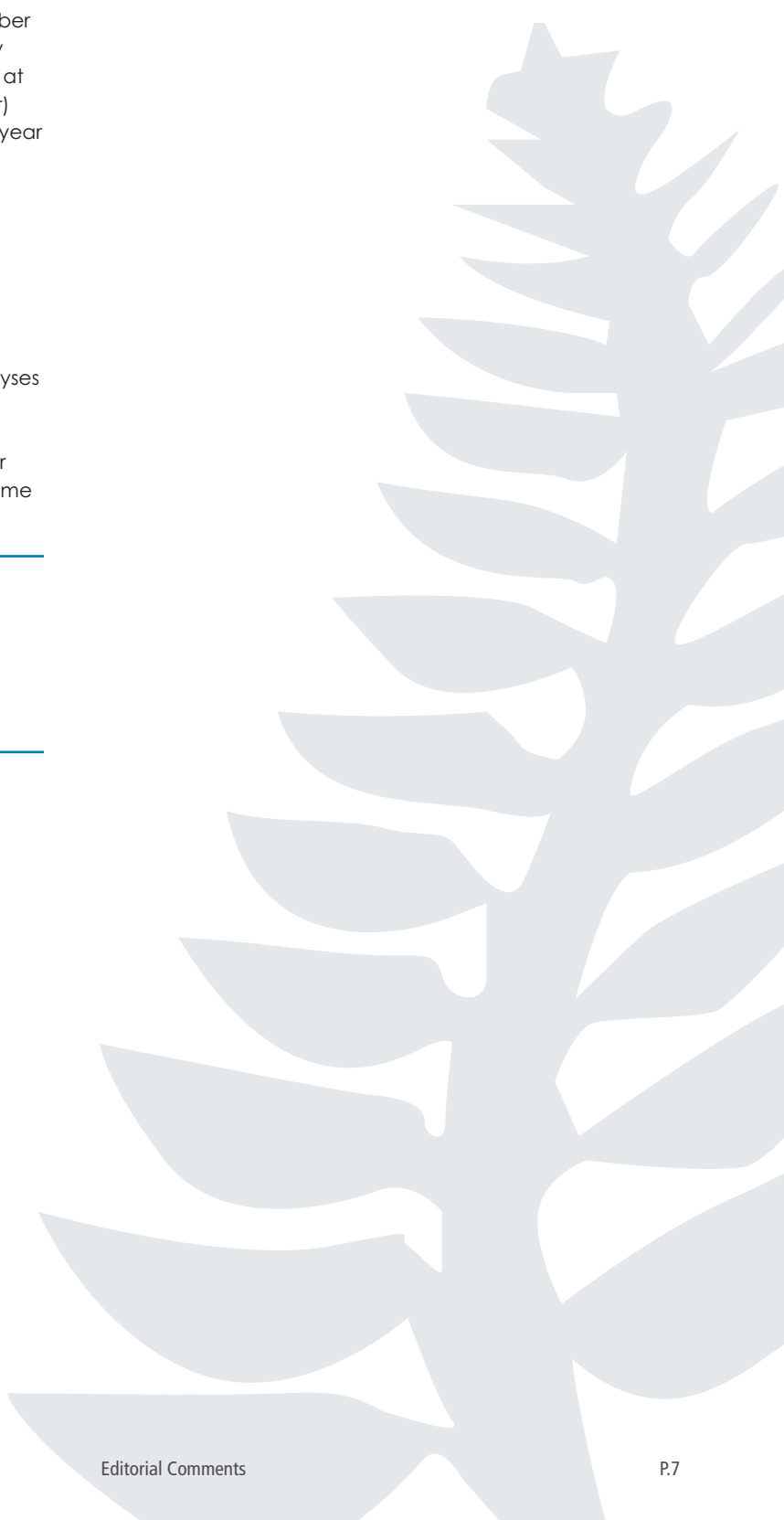
This year Oxford score analyses for some of the larger number hip and knee prostheses have been undertaken and show that there is little score difference among these prostheses at six months and without exception they have higher (better) scores at five years. For all the knee scores the higher five- year scores are not only statistically significant but also clinically significant when compared to the six- month scores.

Shoulder arthroplasty, conventional total and resurfacing head types have significantly higher six month and five- year scores.

Deceased Person's Data

A deceased person's data is valid in perpetuity for all analyses involving the time interval prior to the person's death e.g., if a person dies eight years post primary hip replacement their data is always valid for all analyses for that eight- year period. Hence the rider "deceased patients censored at time of death".

John McKie – Supervisor
James Taylor – Acting Supervisor
Jinny Willis – Coordinator
Chris Frampton – Statistician





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DEVELOPMENT AND IMPLEMENTATION OF THE NEW ZEALAND JOINT REGISTRY

The year 1997 marked 30 years since the first total hip replacement had been performed in New Zealand and as a way of recognizing this milestone it was unanimously agreed by the membership of the New Zealand Orthopaedic Association (NZOA) to adopt a proposal by the then President, Alastair Rothwell, to set up a National Joint Registry.

New Zealand surgeons had always been heavily dependent upon northern hemisphere teaching, training and outcome studies for developing their joint arthroplasty practice and it was felt that it was more than timely to determine the characteristics of joint arthroplasty practice in New Zealand and compare the outcomes with northern hemisphere counterparts. It was further considered that New Zealand would be ideally suited for a National Registry with its strong and co-operative NZOA membership, close relationship with the implant supply industry and its relatively small population. Advantages of a Registry were seen to be survivorship of different types of implants and techniques; revision rates and reasons for these; infection and dislocation rates; patient satisfaction outcomes; audit for individual surgeons, hospitals, and regions; opportunities for in-depth studies of certain cohorts and as a database for fundraising for research.

Administrative Network

It was decided that the Registry should be based in the Department of Orthopaedic Surgery, Christchurch Hospital, and initially run by three part-time staff: a Registry Supervisor (Alastair Rothwell), the Registry Coordinator (Toni Hobbs) and the Registry Secretary (Pat Manning). As all three already worked in the Orthopaedic Department, it was a cost-effective and efficient arrangement to get the Registry underway.

New Zealand was divided into 19 geographic regions and an orthopaedic surgeon in each region was designated as the Regional Coordinator whose task was to set up and maintain the data collection network within the hospitals for that region. This network included a Theatre Nurse Coordinator in every hospital in New Zealand who voluntarily took responsibility for supervising the completion, collection and dispatch of the data forms to the Registry.

Data Collection Forms

The new data forms were introduced at the beginning of December 2020.

In order to improve data accuracy, a surgeon signature box has been added.

A funding box has been added with the options ACC, Private, DHB and DHB outsourced.

A theatre number has been added, meaning that individual theatre ventilation can be analysed.

Robotic assisted has been added under Surgical Adjuncts for hip and knee and under Approach for ankles.

Bone graft has been deleted on all forms except primary and revision shoulder.

Surgeon Attire is a new heading. The options are Space suits/ Helmet Fan, One-piece toga, Sterile Hood and Gown, and Conventional Gown.

Revision forms have been changed to include re-operation. There is now a Revision/Reoperation form for each joint.

The hip form now has 3 procedure sub types- total, resurfacing and hemiarthroplasty, a new sub type.

The knee form also has 3 procedure sub types- total, patello-femoral and unicompartmental.

In conclusion, the aim has been to minimise compromising legacy data, while deleting data points that have not been used in research projects over the past 20 years.

Database

The Microsoft Access 97 database programme was chosen because it is easy to use, has powerful query functions, can cope with one patient having several procedures on one or more joints over a lifetime and has "add on" provisions. The database is expected to meet the projected requirements of the Registry for at least 20 years. It can accommodate software upgrades as required.

Patient Generated Outcomes

The New Zealand Registry was one of the first to collect data from patient generated outcomes. The validated Oxford Hip and Knee outcomes questionnaires were chosen, and questions were added to these, relating to dislocation, infection and any other complication that did not require further joint surgery. These additions have now been discontinued. It was agreed that these questionnaires should be sent to all registered patients six months following surgery and then at five yearly intervals. The initial response rate was between 70 and 75% and this has remained steady.

However, because of the large number of registered primary hip and knee arthroplasties and, on the advice of our statistician, questionnaires have been sent out on a random selection basis since July 2002 to achieve an annual response of 20% for each group. All patients in the other arthroplasty groups, including revision arthroplasty, are sent the questionnaires.

Funding

Several sources of funding were investigated including contributions from the Ministry of Health, various funding agencies, medical insurance societies and an implant levy payable by surgeons and public hospitals to supplement a grant from the NZOA. In the early years the Registry had a "hand to mouth" existence relying on grants from the NZOA and Wishbone Trust until it received significant annual grants from the Accident Compensation Corporation.

From 2002, funding became more reliable with the surgeons paying a \$10 levy, and they now pay \$25 for each joint registered from a private hospital.

The latest MOH contract has been extended for a further 3 years with 4 six monthly payments of \$37,500 (excluding GST) Since 2005 the Southern Cross Hospitals have contributed a grant of \$10,000 annually.

Ethical Approval

Application was made to the Canterbury Ethical Committee early in 1998; first for approval for hospital data collection without the need for patient consent and second for the patient generated outcomes using the Oxford 12 questionnaire plus the additional questions. The first part of the application was initially readily approved but the second part required several amendments to patient information and consent forms before approval was obtained.

A reapplication had to be made when the Ethics Committee of a private hospital chain refused to allow their nurses to participate in the project unless there was prior written patient consent. This view was supported by the Privacy Commissioner on the grounds that the Registry data includes patient identification details. The approval process was eventually successful but did delay the New Zealand-wide launch.

Surgeon and Hospital Reports

Since 2008 each surgeon receives an annual report giving their revision rate for primary registered primary arthroplasties, and this include their questionnaire responses.

Introduction of the Registry

The National Joint Registry was introduced as a planned staged procedure.

Stage I: November 1997 to March 1998

The base administrative structure was established. The data forms and the database were, developed and a trial was performed at Burwood Hospital.

Stage II: April 1998 to June 1998

Further trialling was performed throughout the Christchurch Hospitals and the data forms and information packages were further refined.

Stage III July 1998 to March 1999

The data collection was expanded into five selected New Zealand regions for trial and assessment.

Also, during this time communication networks and the distribution of information packages into the remaining regions of New Zealand were carried out.

Stage IV: April 1st, 1999

The National Joint Registry became fully operational throughout New Zealand.

Inclusion of Other Joint Replacement Arthroplasties

At the request of the NZOA membership, the database for the Registry was expanded to include total hip replacements for fractured neck of femur, unicompartmental replacements for knees, and total joint replacements for ankles, elbows and shoulders (including hemiarthroplasty for the latter). Commencement of this data collection was in January 2000 and this information is included in the annual surgeon and hospital reports.

The validated Oxford questionnaire was available for the shoulder and derived, but not validated, questionnaires developed for the elbow and ankle joints.

In 2016 the Oxford Elbow Score (OES) and the Manchester-Oxford Foot Questionnaire were introduced replacing the former questionnaires that were not validated.

All patients receiving total arthroplasty of the above joints, as well as unicompartmental knee arthroplasties, are sent questionnaires with a response rate of 70 %. As for hips and knees, the questionnaires are sent out 6M post-surgery then at 5Y, 10Y and 15Y and 20Y.

Monitoring of Data Collection

The aim of the Registry is to achieve a minimum of 90% compliance for all hospitals undertaking joint replacement surgery in New Zealand.

It is quite easy to check the compliance for public hospitals as they are required to make regular returns with details of all joint replacement surgery to the NZ Health Information Service. The registered joints from the Registry can be compared against the hospital returns for the same period and the compliance calculated. Any obvious discrepancies are checked out with the hospitals concerned and the situation remedied. It is more difficult with private hospital surgery as they are not required to file electronic returns. However, by enlisting the aid of prosthesis supply companies, it is possible to check the use of prostheses region by region and any significant discrepancy is further investigated. In addition, any change in the pattern of returns from private hospitals is checked.

Another method is to check data entry for each hospital against the previous corresponding months and if there is an obvious trend change then again this is investigated.

The most recent compliance audit in February 2021 again demonstrated a New Zealand-wide public hospital compliance of > 95% when compared to NZHIS data.

Following the introduction of the South Island PICS system at the beginning of October 2018, the Registry lost the ability to search for nationwide NHI entries and was not able to access nationwide date of death registrations.

This has now been overcome, and the data entry staff now use the MOH HealthUI (Health User Interface) lookup system to check NHI entries and addresses.

Also, the Registry can now access the nationwide death files through the MOH'S Connected Health Network SFPT service with twice monthly updates.

Accurate date of death registrations are essential for both our statistical analyses and our monthly questionnaire mail outs.

NZJR Staff

The current staff are data entry (2.20 FTE), Registry coordinator (1.0 FTE), Registry supervisor (0.2 FTE) and statistician (0.04 FTE).

STATISTICAL NOTES

In the table below, there are two statistical terms readers may not be familiar with:

i) Observed component years

This is the number of registered primary procedures multiplied by the number of years each component has been in place.

ii) Rate/100 component years

This is equivalent to the yearly revision rate expressed as a percent and is derived by dividing the number of prostheses revised by the observed component years multiplied by 100. It therefore allows for the number of years of post-operative follow up in calculating the revision rate. These rates are usually very low, hence are expressed per 100 component years rather than per component year. Statisticians consider that this is a more accurate way of deriving a revision rate for comparison when analysing data with widely varying follow up times. It is also important to note the confidence intervals. The closer they are to the estimated revision rate/100 component years, the more precise the estimate is.

Statistical Significance

Where it is stated that a difference among results is significant the p value is 0.05 or less. In most of these situations this is because there is no overlap of the confidence intervals (CIs) but sometimes significance can apply in the presence of CI overlap.

ADDITIONAL ANALYSES

The total number of registered joint arthroplasties for the 23 - year period to December 2021 was 372,444. During this period, 245,460 individual patients were registered, of which 62,840 (25.6%) have now died.

Bilateral joint replacements carried out under the same anaesthetic:

Bilateral total hips

3,123

patients (6,246 hips)
3.8% of primary hips

Bilateral total knees

6,629

patients (13,258 knees)
9.7% of primary knees

Bilateral Unicompartmental knees

1,1216

patients (2,432 knees) 15% of
unicompartmental knees

Bilateral ankles

2

patients (4 ankles)

Bilateral shoulders

5

patients (10 shoulders)

Trainee Surgeons: In the following analyses consultants took responsibility for their registrar surgeon procedures.

HIP ARTHROPLASTY

PRIMARY HIP ARTHROPLASTY

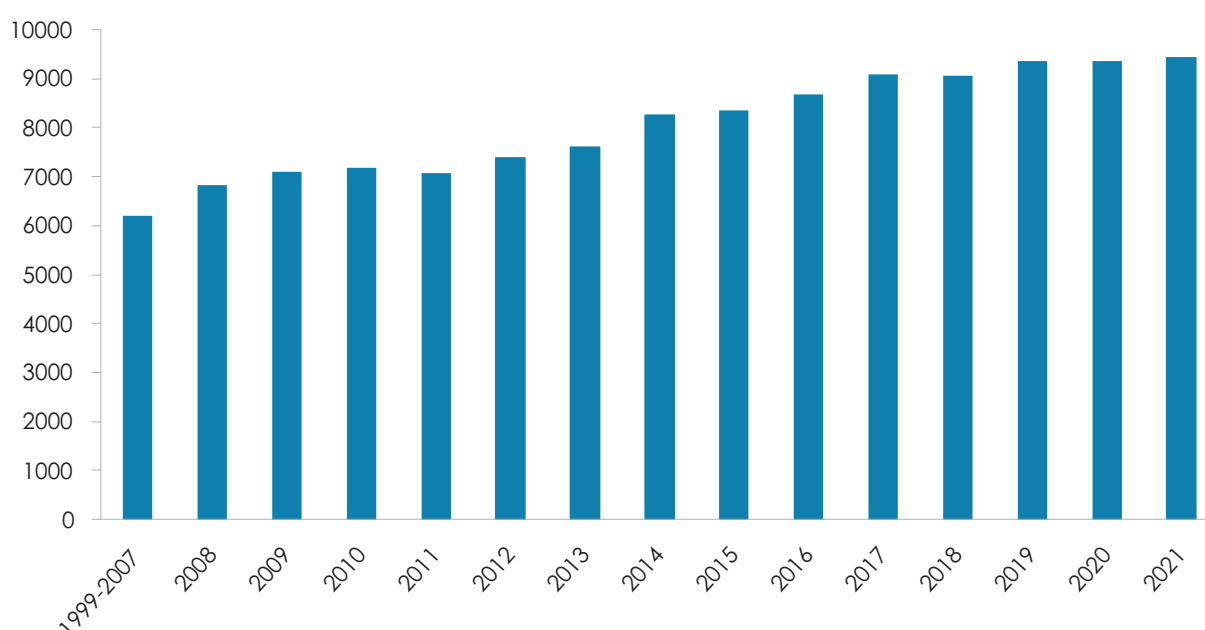
The **twenty-three-year** report analyses data for the period January 1999 – December 2021. There were 9,428 new registrations in 2021.

New data forms introduced in October 2020 now have 3 categories of hip replacement. These are total hips with 164,364 registered, resurfacing hips with 2,200 registered and hemiarthroplasty with 1,107 registered.

Registered PHA Procedures at 31 December 2021

Primary Hip Arthroplasty (PHA) Type	N
THA - Total Hip Arthroplasty	164,363
RHA - Resurfacing Hip Arthroplasty	2,200
HHA - Hip Hemiarthroplasty	1,107
Total	167,670

Number of Total Hip Arthroplasty Procedures by Year



Data Analysis

Total hip arthropasty	Female	Male
Number	88,085	76,278
Percentage	53.59	46.41
Mean age	68.57	65.89
Maximum age	100.95	99.97
Minimum age	13.43	14.64
Std Dev	11.32	11.36

Resurfacing Hip	Female	Male
Number	263	1,937
Percentage	11.95	88.04
Mean age	50.04	52.54
Maximum age	65.88	81.44
Minimum age	25.71	17.74
Std Dev	7.23	8.62

Hemiarthroplasty	Female	Male
Number	731	375
Percentage	66.09	33.91
Mean age	84.68	84.36
Maximum age	101.75	102.16
Minimum age	35.31	42.67
Std Dev	8.41	8.74

Body Mass Index

The 2010 form update added BMI data. For the twelve-year period 2010 – 2021 there were 73,637 BMI registrations for primary hip replacements (72%). The average was 29.14 with a range of 13 – 66 and a standard deviation of 5.73.

BMI	No. Operations	%
< 19	758	1.0
19 - 24	15,109	20.5
25 - 29	27,634	37.5
30 - 39	27,119	36.8
40+	3,017	4.1



Ethnicity	N
Asian	1,337
Euro/Other	143,939
Māori	12,642
Not Reported	4,762
Pacifica	1,683

Data form analysis includes data from both the new and legacy data forms and is for total hip replacement.

Previous operation	N
None	158,019
Internal fixation	2,817
Osteotomy	785
Arthrodesis	101
Hip arthroscopy	51

Diagnosis	N
Osteoarthritis	144,729
Rheumatoid arthritis	2,902
Other inflammatory	1,082
Acute fracture NOF	6,336
Old fracture NOF	1,847
Avascular necrosis	4,906
Developmental dysplasia/congenital dislocation	3,322
Tumour	746
Post-acute dislocation	367

Systemic antibiotic prophylaxis	
Patient number receiving at least one systemic antibiotic:	165,911 (99%)

ASA Class

The 2005 form update included ASA class for all patients. For the 17-year period 2005 – 2021, there were 130,695 total hip primary procedures (95%) with the ASA class recorded.

ASA Class	ASA Definition	N	%
1	A healthy patient	19,727	15.23
2	Mild systemic disease	77,173	59.56
3	Moderate systemic disease	31,533	24.34
4	Incapacitating systemic disease	1,132	0.87

Surgeons

Surgeons

In 2021, 272 surgeons performed 10,624 primary hip replacements, an average of 39 procedures per surgeon.

Surgical Approach	N
Posterior	111,638
Lateral	36,083
Troch	164

Surgical Adjuncts	N
Image Guided	739
Not Image Guided	163,624

Operative time (skin to skin)

Average 77.83 minutes
Range 10 -775 minutes SD 27.51

Operative time (skin to skin)	Time
Average	77.83 minutes
Range	10 -775 minutes
Standard Deviation	27.51

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the 17-year period 2005 – 2021.

Surgeon Grade	N
Consultant	119,221
Advanced trainee supervised	11,563
Advanced trainee unsupervised	3,967
Basic trainee	2,651

Hospitals & Environment

Hospitals

In 2020, PHA procedures were performed in 27 public and 25 private hospitals.

Operating theatre	N
Conventional	100,114
Laminar flow	61,606

Surgeon Attire	N
No suit	116,385
Suit	47,978

Prosthesis Usage

Top 10 hip-femur components in 2021

Prosthesis	N
Exeter V40	3,355
Corail	1,756
Accolade II	724
MS 30	412
Tapertoc Complete	340
Echo Bi-Metric	329
C-Stem AMT	296
Polarstem uncemented	256
CLS	216
Stemsys	208

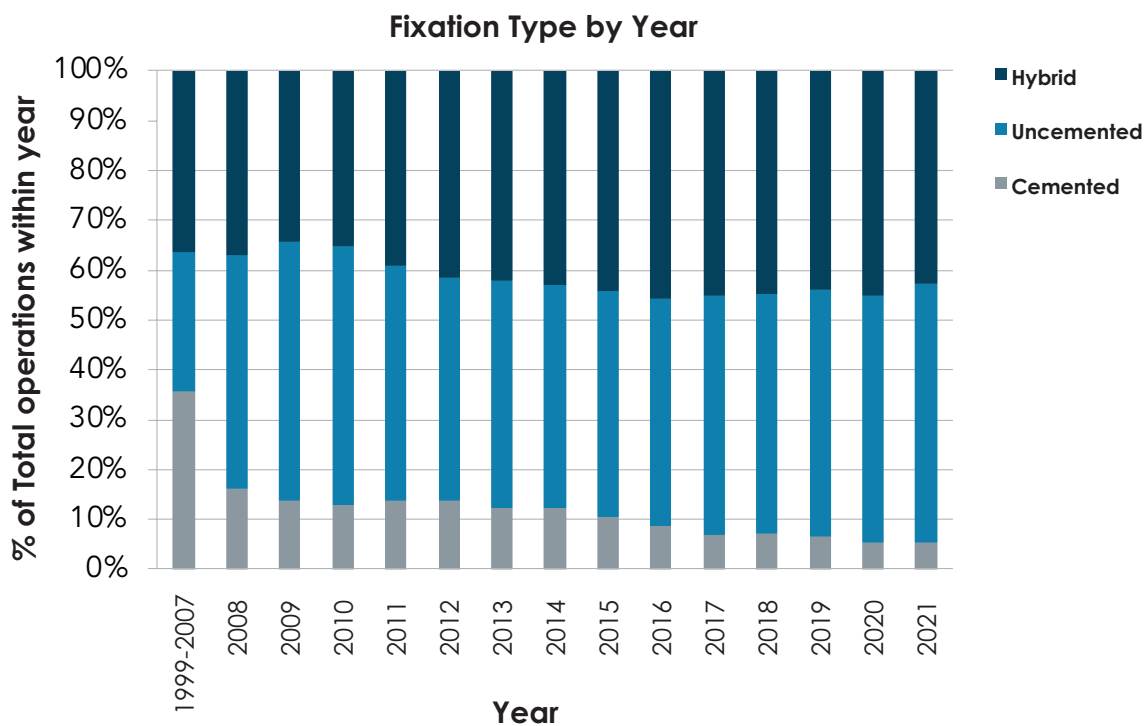
Top 10 acetabular components in 2021

Prosthesis	N
Pinnacle	2,528
Trident	1,491
RM Pressfit cup	870
Trident II Tritanium	579
Continuum TM	488
G7 acetabular shell	869
Tritanium	420
R3 porous	315
Fitmore	287
Exeter X3	249

Top ten combinations used in 2021

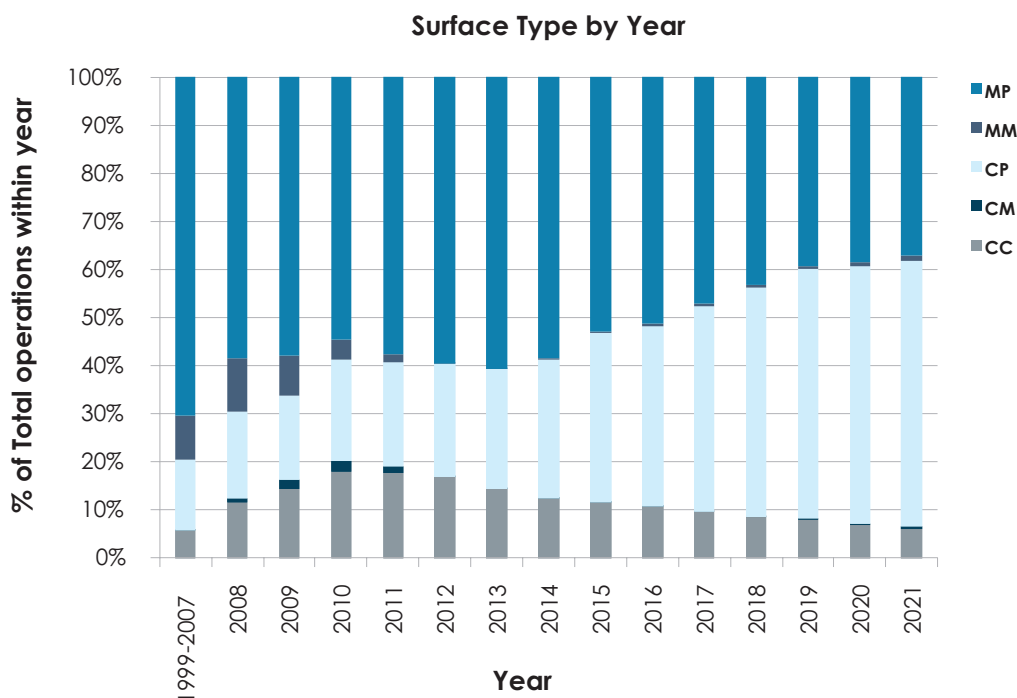
Femur	Acetabulum	2021
Corail	Pinnacle	1,625
Exeter V40	Trident	1,182
Exeter V40	Trident II Tritanium	493
C-Stem AMT	Pinnacle	269
Exeter V40	Pinnacle	256
Exeter V40	Exeter X3	249
Accolade II	Tritanium	235
Accolade II	Trident	226
Exeter V40	RM Pressfit cup	214
Polarstem uncemented	R3 porous	208

THA Fixation Type by Year

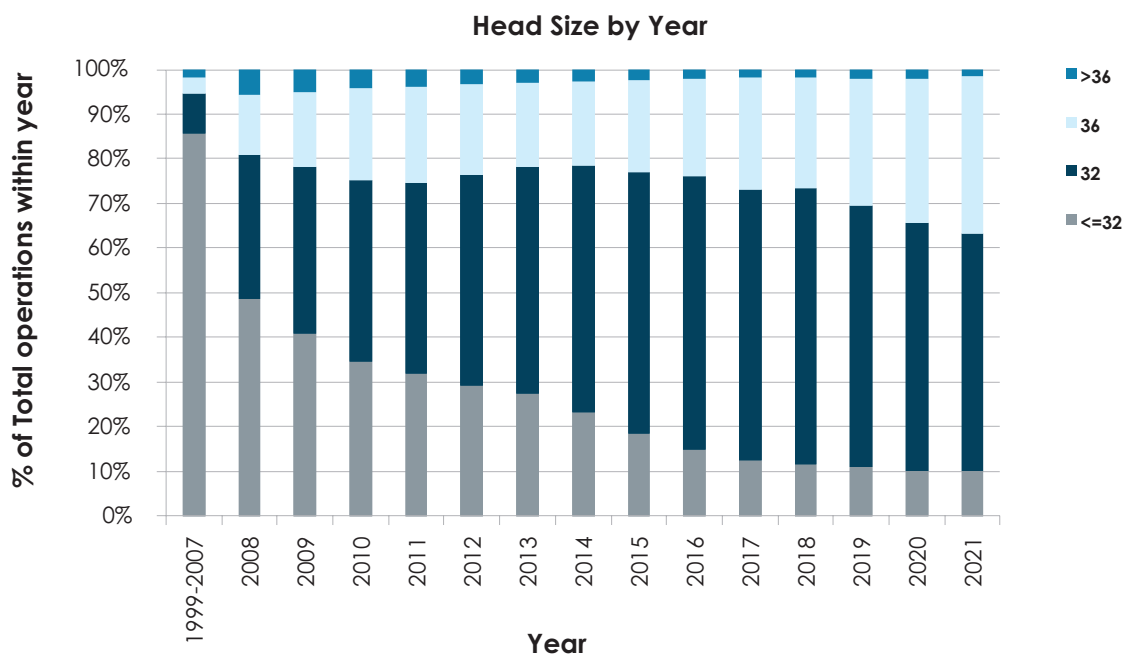




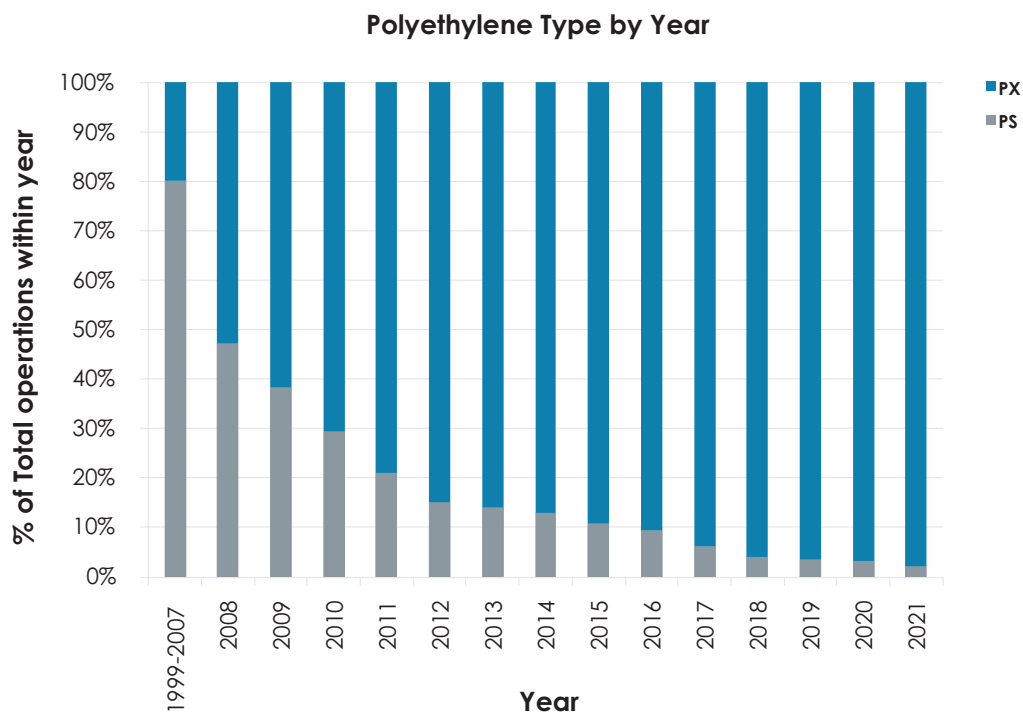
THA Bearing Type by Year



THA Head Size by Year



Standard (PS) vs Highly cross linked (PX) Polyethylene Usage by Year



Femoral Components with >1000 procedures in the last 5 years (2017-2021)

Femur Prosthesis	N
Exeter V40	17,093
Corail	8,187
Accolade II	2,939
C-STEM AMT	1,939
MS 30	1,655
Stemsys	1,496
Polarstem uncemented	1,443
Taperloc Complete	1,355
TwinSys cemented	1,177
CLS	1,131
Echo Bi-Metric	1,117
CPT	1,036
TwinSys uncemented	1,011

Acetabular Components with >1000 procedures in last 5 years (2017-2021)

Acetabular Prosthesis	N
Pinnacle	12,279
Trident	7,092
RM Pressfit cup	4,904
Continuum TM	3,703
Tritanium	2,894
R3 porous	2,180
G7 acetabular	2,020
Fitmore	1,839
Exeter X3	1,481
Trident II Tritanium	1,345
Trilogy	1,223
Delta-TT Cup	1,101

Resurfacing hips components used in 2021

Prosthesis	N
Adept	4
ASR	132
BHR	2,017
BMHR	28
Conserve Superfinish	3
Durom	4
Mitch TRH Resurfacing Head	12



REVISION HIP ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced hip joint during which one of the components is exchanged, removed, manipulated or added.

Procedures where all components are removed (e.g., Girdlestone, ankle fusion post failed ankle replacement, or removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

Data analysis

For the twenty-three-year period January 1999 – December 2021, there were 22,730 hip revision procedures registered. This is an additional 1,022 compared to last year's report.

The average age for a hip revision was 70 years, with a range of 11 – 98 years.

REVISION OF REGISTERED TOTAL HIP ARTHROPLASTIES

This section analyses data for registered total hip arthroplasties followed-up for revision to 31 March 2021.

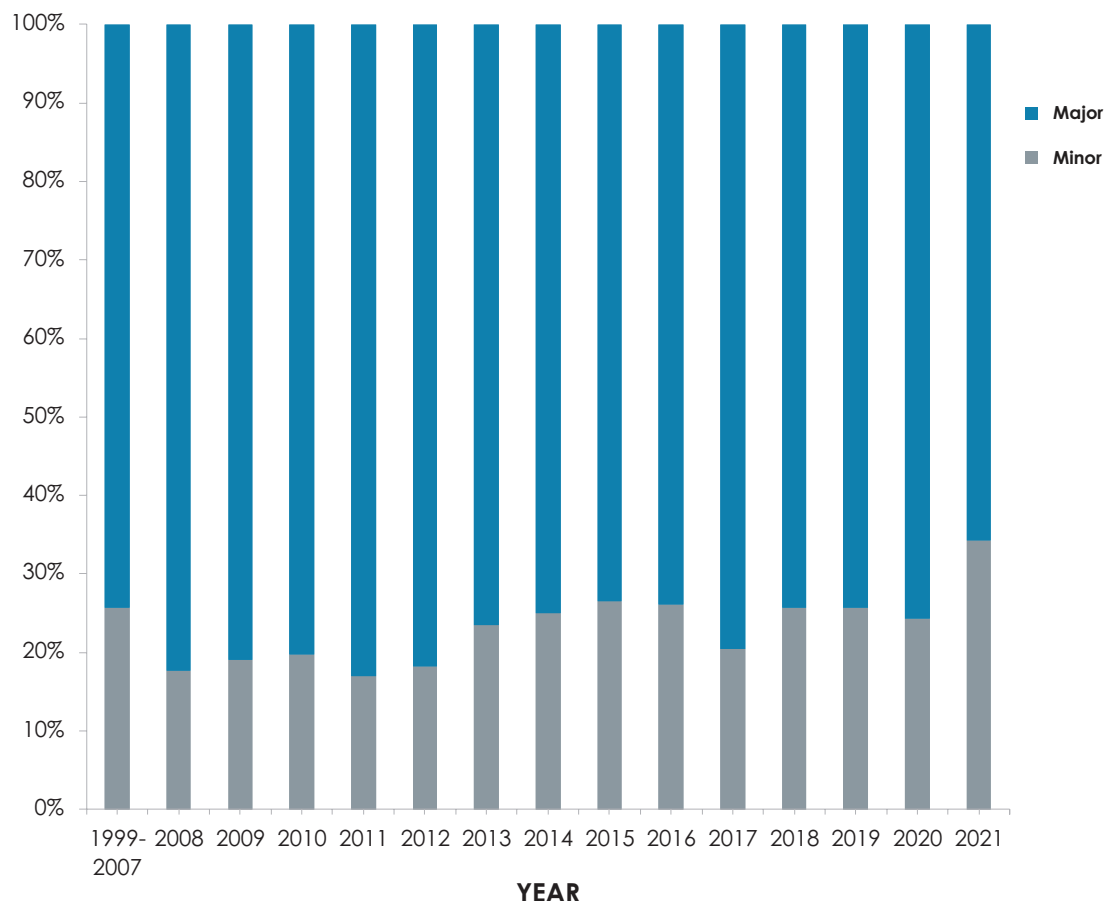
No. Ops.	Observed comp. Yrs	Number Revised	Rate/100-Component-years	Exact 95% Confidence Interval	
164,363	1306102.1	8,458	0.6476	0.63	0.66

Total hip arthroplasty

Time to revision from Primary Procedure	Days	(Equiv. years)
Average	2,374	(6.5)
Maximum	8,702	(23.8)
Minimum	0	(0.0)

Reason for revision	Days
Dislocation/instability	1,870
Loosening acetabular component	1,880
Loosening femoral component	1,515
Unexplained pain	1,266
Deep infection	1,280
Fracture femur	1,218

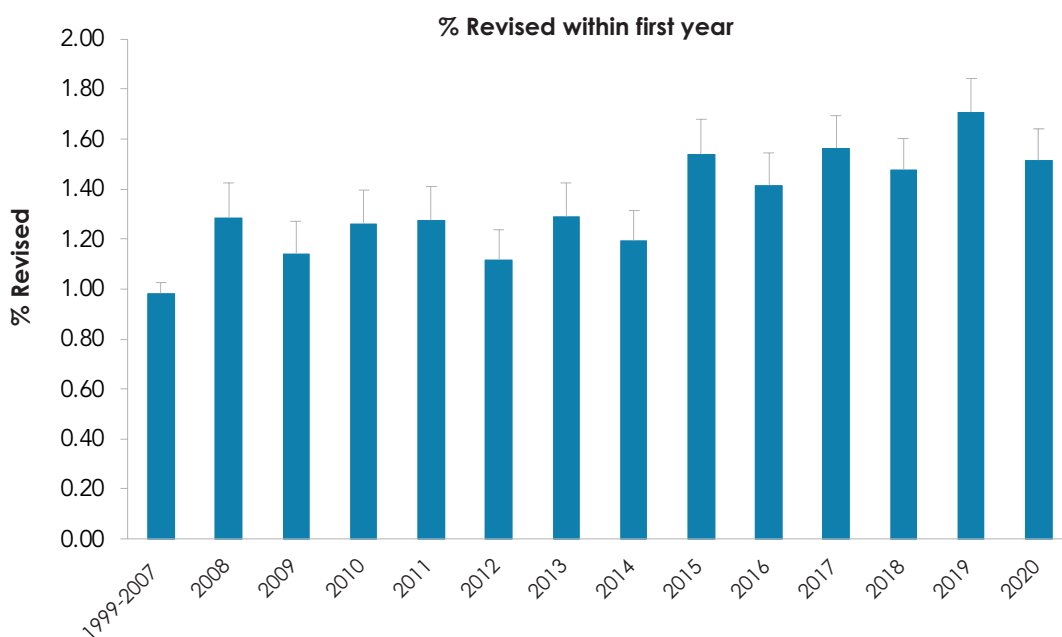
Comparison of Major vs Minor Revisions by Year



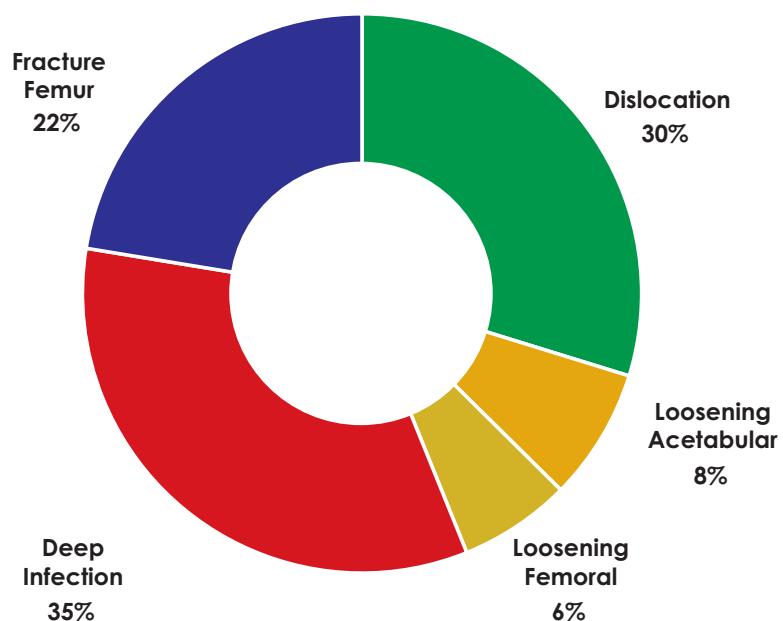
Revision THA procedures are categorised according to the table below –

Revision Procedure	Category
Change of all components	Major
Change of femoral component	Major
Change of acetabular shell	Major
Change of acetabular liner	Minor
Change of modular femoral head	Minor
Removal of components only	Major / Minor / (not included)
Re-operation only: no components added, exchanged or removed	(not included)

Percentage of hips revised within one year of primary procedure

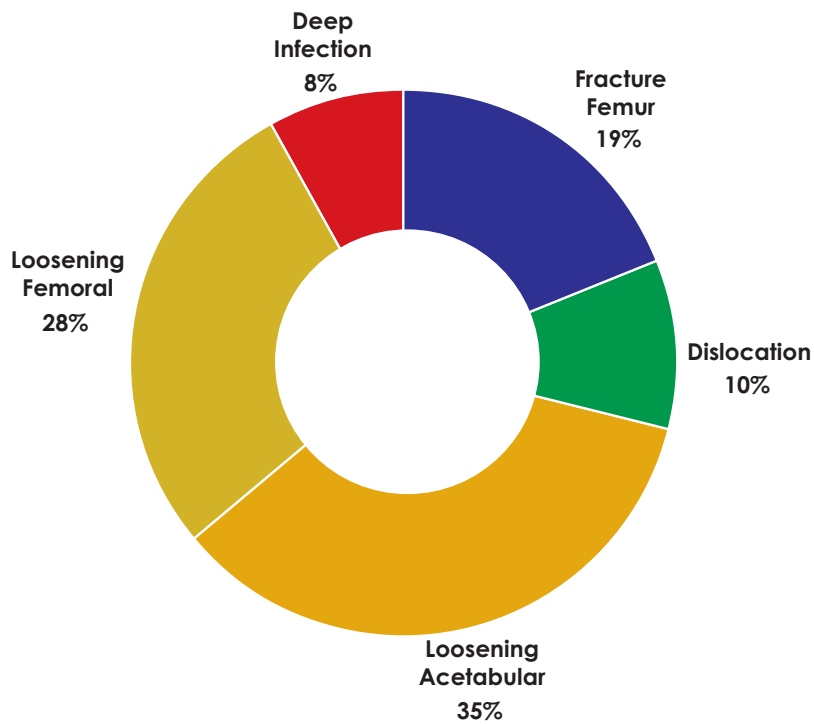


Indication for Revision (%) within first year





Indication for Revision (%) beyond 10 Years



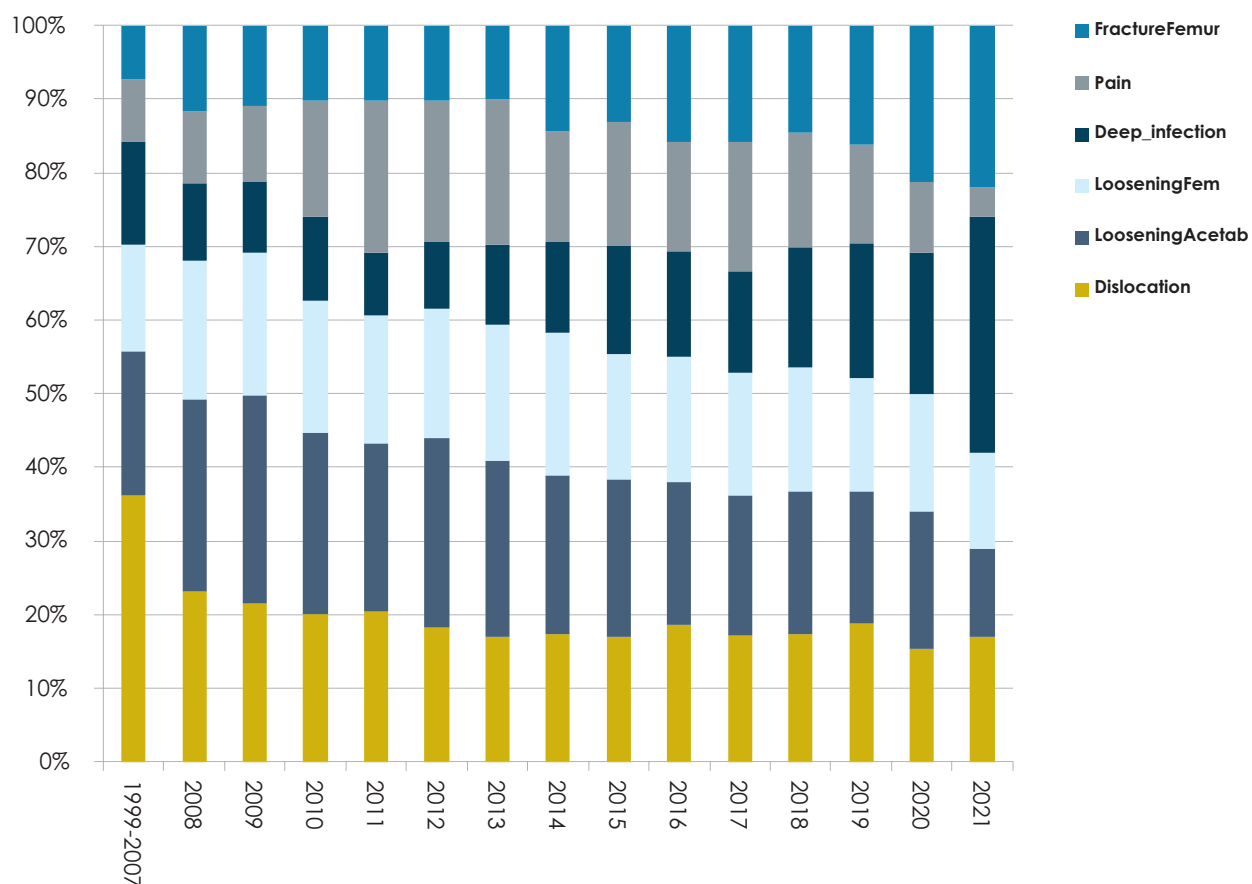
Analysis of the six main reasons for revision by year after total hip replacement

Years	Dislocation		Loosening Acetabular		Loosening Femoral		Deep infection		Pain		Fracture Femur	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
0	713	40.9	185	10.5	124	8.9	525	46.3	95	8.1	325	30.8
1	192	11.0	87	4.9	93	6.7	117	10.3	114	9.7	62	5.9
2	148	8.5	84	4.8	88	6.3	97	8.6	98	8.3	55	5.2
3	108	6.2	93	5.3	86	6.2	57	5.0	76	6.5	50	4.7
4	77	4.4	75	4.3	73	5.2	43	3.8	74	6.3	61	5.8
5	76	4.4	85	4.8	75	5.4	43	3.8	84	7.1	49	4.6
6	71	4.1	100	5.7	98	7.0	32	2.8	71	6.0	45	4.3
7	48	2.8	91	5.2	91	6.5	32	2.8	58	4.9	44	4.2
8	61	3.5	107	6.1	80	5.7	36	3.2	69	5.9	51	4.8
9	39	2.2	125	7.1	81	5.8	34	3.0	63	5.4	57	5.4
10	37	2.1	94	5.3	96	6.9	24	2.1	64	5.4	52	4.9
>10	173	9.9	636	36.1	409	29.3	94	8.3	311	26.4	205	19.4
Total	1,743	100.0	1,762	100.0	1,394	100.0	1,134	100.0	1,177	100.0	1,056	100.0

Analyses of numbers of the six main reasons for revision by year

Years	Dislocation		Loosening Acetabular		Loosening Femoral		Deep infection		Pain		Fracture Femur		Total
	n	%	n	%	n	%	n	%	n	%	n	%	
1999-2007	463	37.8	251	20.5	186	15.2	179	14.6	109	8.9	93	7.6	1,225
2008	82	24.3	92	27.3	67	19.9	37	11.0	35	10.4	41	12.2	337
2009	84	22.5	111	29.7	76	20.3	38	10.2	40	10.7	43	11.5	374
2010	88	21.4	108	26.2	79	19.2	50	12.1	69	16.7	45	10.9	412
2011	106	20.4	119	22.9	90	17.3	45	8.7	107	20.6	53	10.2	519
2012	92	17.2	130	24.3	89	16.6	46	8.6	97	18.1	52	9.7	536
2013	95	15.8	134	22.3	103	17.1	61	10.1	110	18.3	56	9.3	602
2014	87	15.4	108	19.1	97	17.2	62	11.0	75	13.3	72	12.7	565
2015	103	16.4	129	20.5	103	16.4	89	14.2	102	16.2	79	12.6	628
2016	105	16.9	110	17.7	96	15.5	81	13.0	84	13.5	89	14.3	621
2017	104	16.6	116	18.6	101	16.2	84	13.4	107	17.1	96	15.4	625
2018	102	16.2	114	18.1	99	15.7	97	15.4	91	14.4	86	13.7	630
2019	131	18.5	125	17.7	107	15.1	127	18.0	94	13.3	112	15.8	707
2020	84	14.9	103	18.3	88	15.7	106	18.9	53	9.4	117	20.8	562
2021	17	14.8	12	10.4	13	11.3	32	27.8	4	3.5	22	19.1	115

Revisions (%) sorted by Indication and Year of Implantation





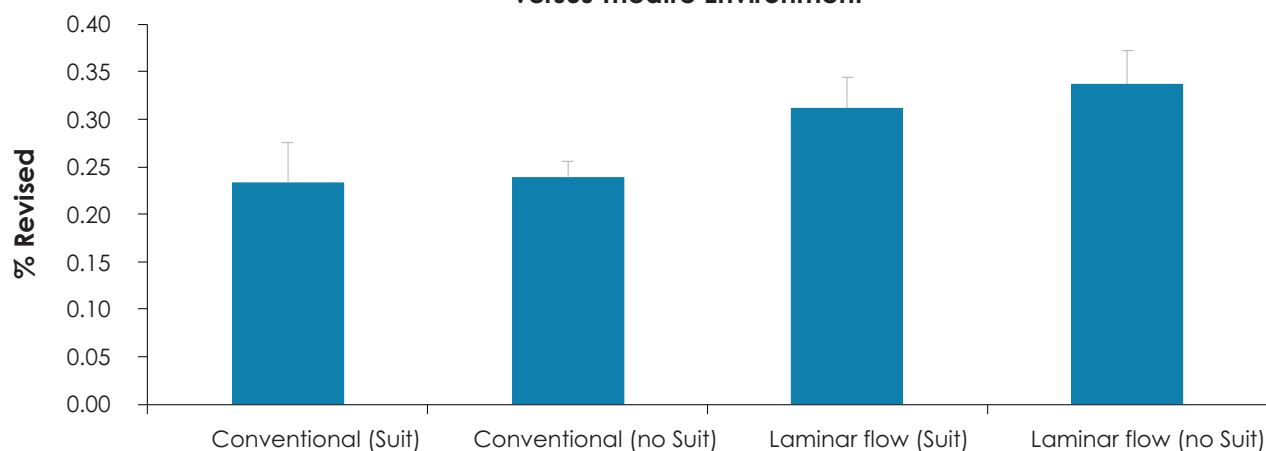
Deep Infection Revision within 6 months of operation.

Operating Theatre	N	Number Revised	%	SE	
Conventional	96,446	230	0.23848	0.01571	p=0.002
Laminar flow	59,513	193	0.32430	0.02331	

	N	Number Revised	%	SE	
Suit	44,366	128	0.28851	0.02546	0.298
No suit	111,593	295	0.26435	0.01537	

Operating Theatre		N	Number Revised	%	SE	
Conventional	Suit	13,305	31	0.23300	0.04180	p=0.789
	no suit	83,141	199	0.23935	0.01695	
Laminar flow	Suit	31,061	97	0.31229	0.03166	p=0.590
	no suit	28,452	96	0.33741	0.03438	

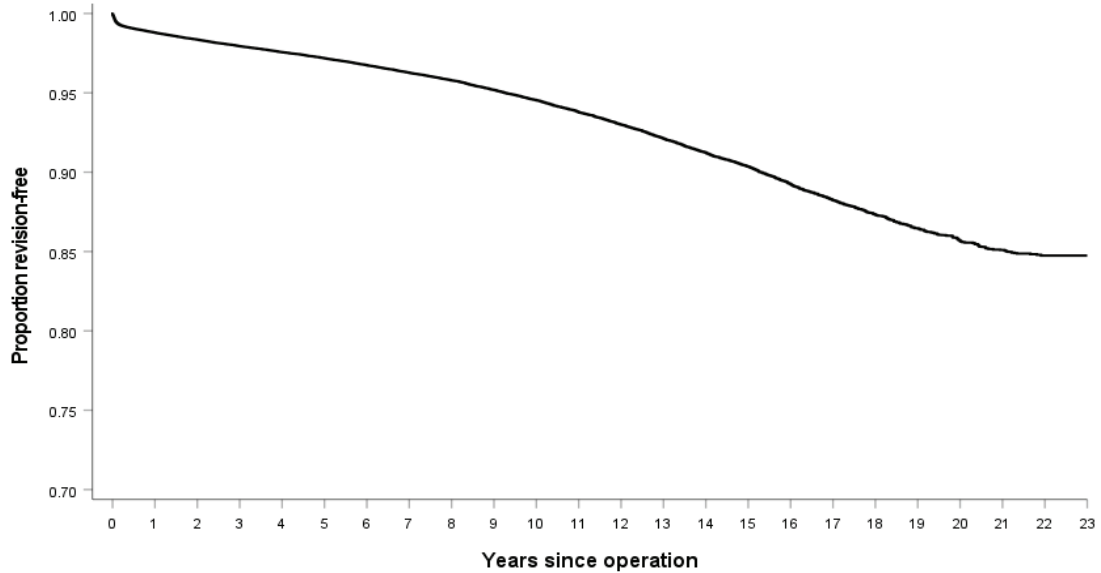
% Revision for Deep infection within 6 months versus Theatre Environment



KAPLAN MEIER CURVES

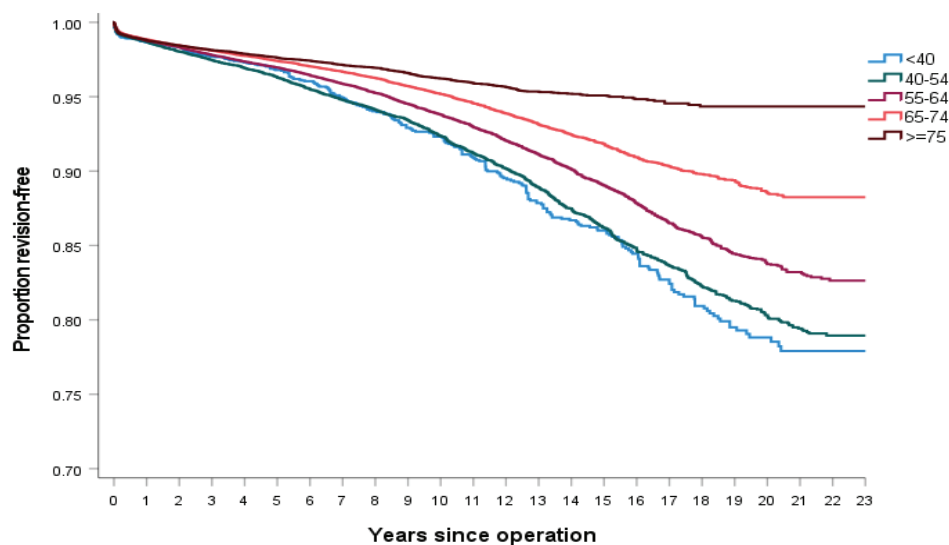
The following Kaplan Meier survival analyses are for the 22 years 1999 – 2021 with deceased patients censored at time of death.

Revision - All Causes



Revision vs Age Bands

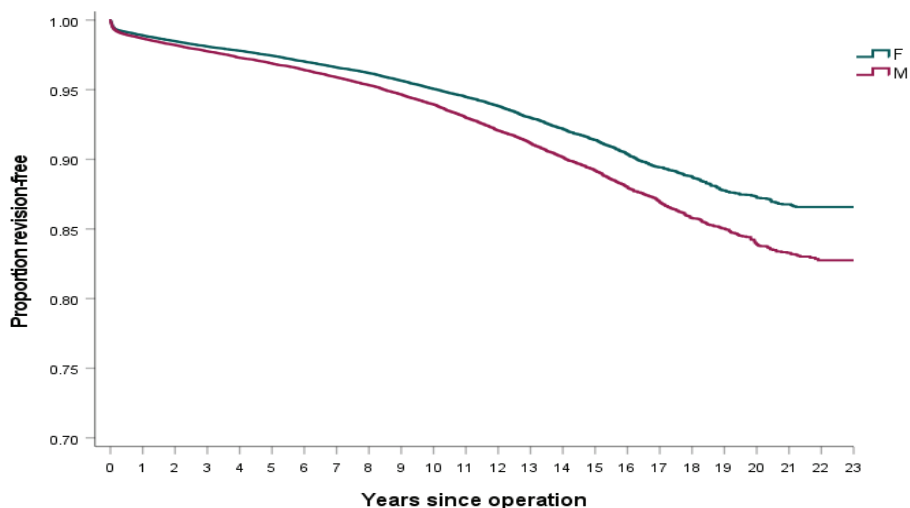
Age Groups	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% Confidence Interval	
<40	2,581	25675.8	250	0.97	0.86	1.10
40-54	20,725	193781.4	1,808	0.93	0.89	0.98
55-64	41,301	360289.3	2,675	0.74	0.71	0.77
65-74	55,662	445164.4	2,498	0.56	0.54	0.58
>=75	44,094	281191.1	1,227	0.44	0.41	0.46





Revision vs Gender

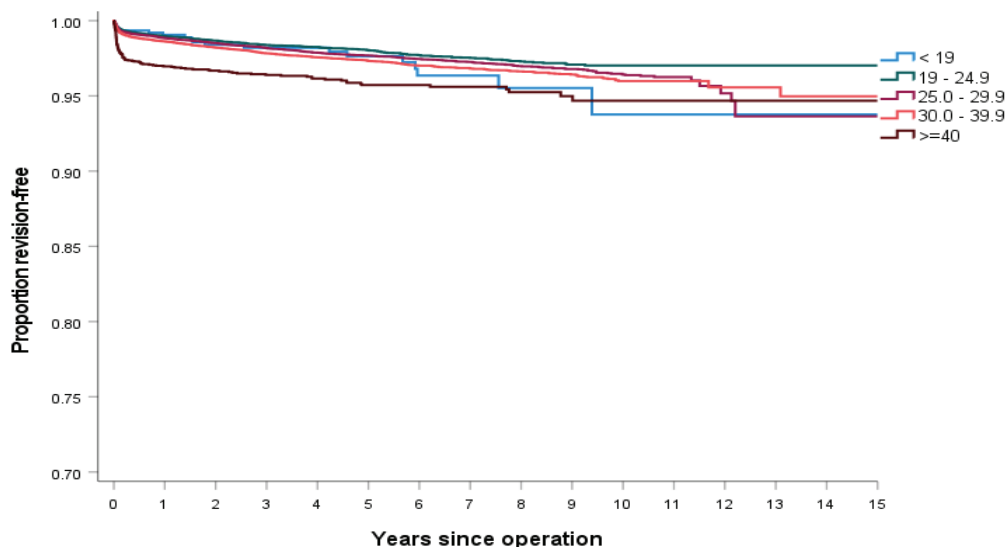
Sex	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
F	88,085	697875.1	4,043	0.58	0.56	0.60
M	76,277	608226.2	4,415	0.73	0.70	0.75



Revision Rate by BMI

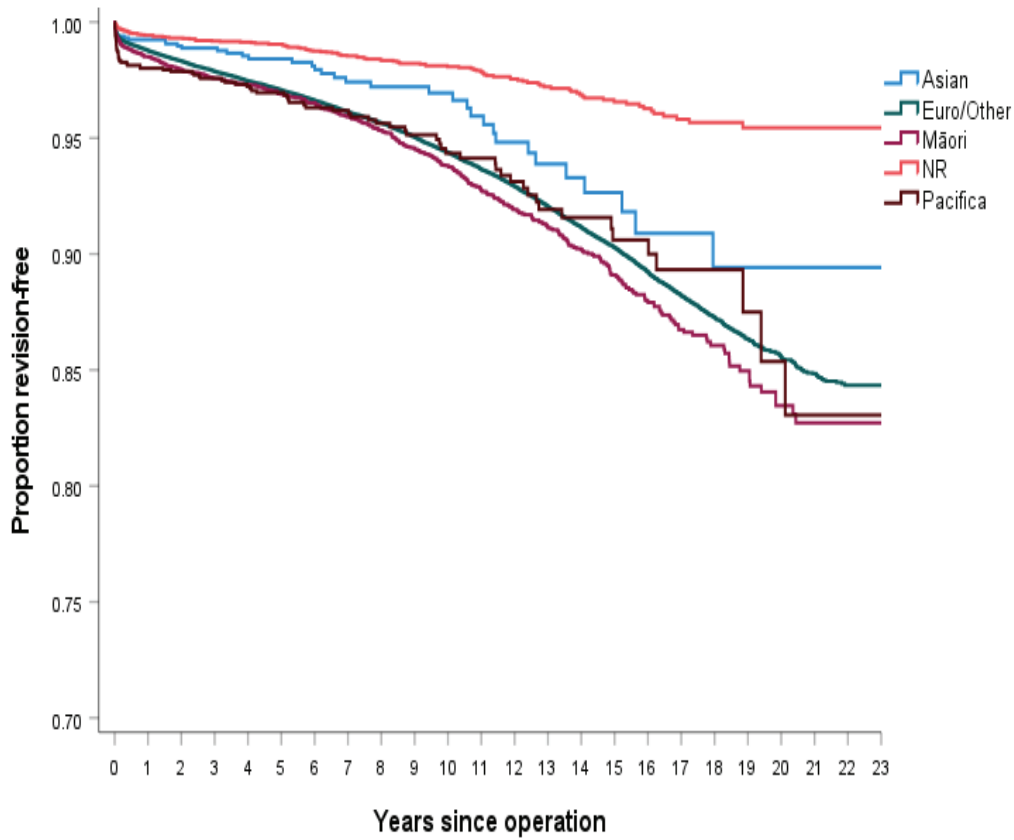
For the 12- year period 2010 – 2021, there were 4,939 BMI registrations for revision hip replacements. The average BMI was 29.2, standard deviation 5.77, and range 15- 55.

BMI kg/m ²	No. Ops.	Observed comp. years	Number Revised	Rate/100 component years	Exact 95% Confidence Interval	
< 19	758	3301.0	19	0.58	0.35	0.90
19 - 24	15,109	72110.0	292	0.40	0.36	0.45
25 - 29	27,634	133914.4	620	0.46	0.43	0.50
30 - 39	27,119	127148.6	679	0.53	0.49	0.58
40+	3,017	13382.3	119	0.89	0.74	1.06



Revision by Ethnicity

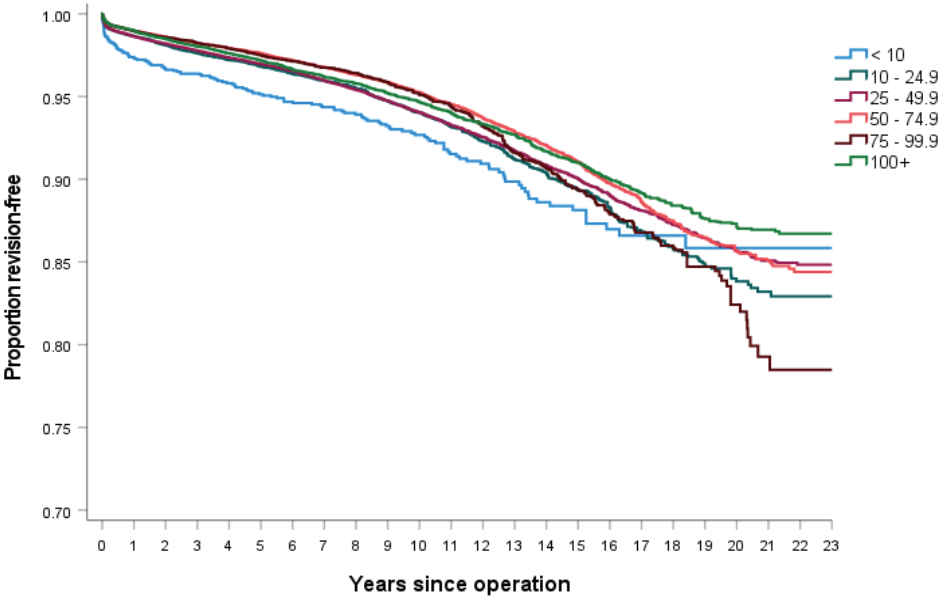
Ethnicity	No. Ops.	Observed comp. years	Number Revised	Rate/100 component years	Exact 95% Confidence Interval	
Asian	1,337	8860.9	39	0.44	0.31	0.60
Euro/Other	143,939	1141772.2	7,551	0.66	0.65	0.68
Māori	12,642	91453.0	672	0.73	0.68	0.79
NR	4,762	52015.9	115	0.22	0.18	0.27
Pacifica	1,683	12000.1	81	0.67	0.53	0.83





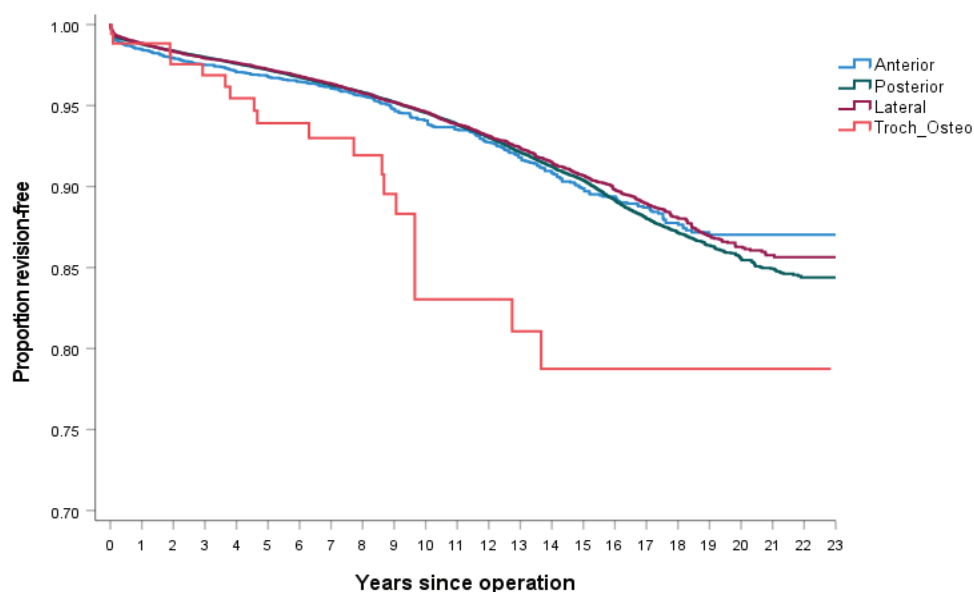
Revision Rate by Surgeon Annual Workload

Operations per year	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
<10	1,853	15735.3	141	0.90	0.75	1.06
10-24	16,053	131806.5	931	0.71	0.66	0.75
25-49	63,599	508930.3	3,498	0.69	0.66	0.71
50-74	43,285	333422.3	1,946	0.58	0.56	0.61
75-99	17,529	120791.4	711	0.59	0.55	0.63
>=100	22,044	195416.2	1231	0.63	0.60	0.67



Revision Rate by Surgical Approach

Approach	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Anterior	5,655	49049.1	352	0.72	0.64	0.80
Posterior	111,638	849595.9	5,519	0.65	0.63	0.67
Lateral	36,083	323567.2	1,984	0.61	0.59	0.64
Troch	164	1350.9	17	1.26	0.73	2.01



Revision Rate by Surgical Adjunct

Image guided	N	Sum com. Years	Events	Rate/100-Component-Years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Not Guided	163,624	1301227.6	8,441	0.65	0.63	0.66
Guided	739	4874.4	17	0.35	0.20	0.55

Revision in Public vs Private Hospitals

Public/Private	N	Sum com. Years	Events	Rate/100-Component-Years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Public	86,175	668190.9	4,305	0.64	0.63	0.66
Private	78,188	637911.2	4,153	0.65	0.63	0.67

Revision vs ASA Status

ASA Class	No. Ops.	Observed comp. years	Number revised	Rate/100 Component years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
1	19,727	150613.6	885	0.59	0.55	0.63
2	77,173	513854.6	2,755	0.54	0.52	0.56
3	31,533	173807.4	1,081	0.62	0.59	0.66
4	1,132	4239.7	38	0.90	0.63	1.23

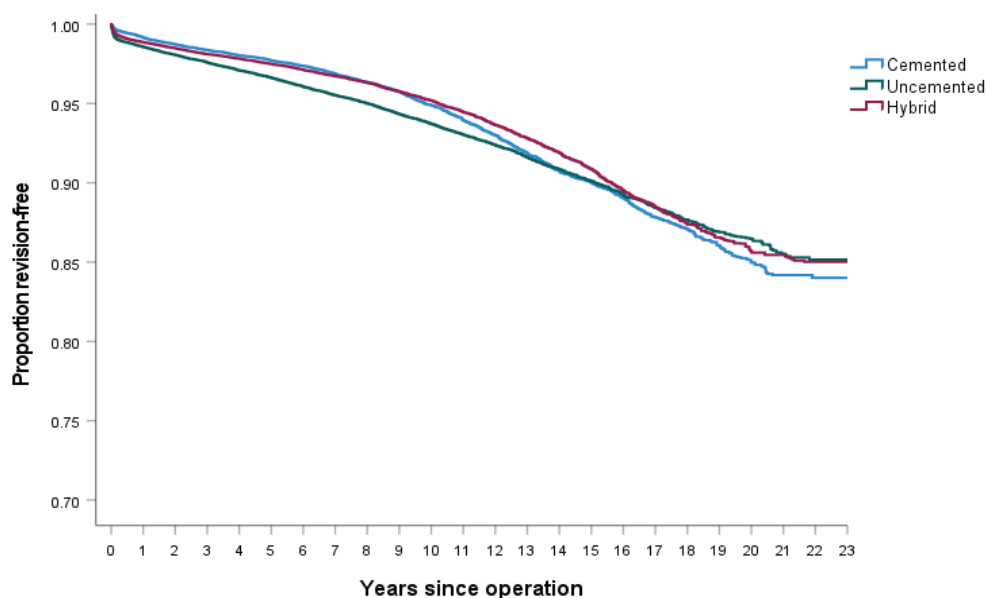


Revision in Public and Private Hospitals by ASA Class

ASA Class	Hospital Type	No. Ops.	Observed comp. years	Number Revised	Rate/100-component-years	Exact 95% Confidence Interval	Upper 95% Confidence Interval
1	Public	6,360	50496.7	295	0.58	0.52	0.65
1	Private	13,367	100117.0	590	0.59	0.54	0.64
2	Public	38,666	264028.7	1,405	0.53	0.50	0.56
2	Private	38,507	249825.9	1,350	0.54	0.51	0.57
3	Public	21,266	115074.5	724	0.63	0.58	0.68
3	Private	10,267	58732.9	357	0.61	0.55	0.67
4	Public	980	3437.2	31	0.90	0.61	1.28
4	Private	152	802.5	7	0.87	0.35	1.80

Revision Rate by Component Fixation

Cementation	No. Ops.	Observed Comp. Years	Number Revised	Rate/100-Component-Years	Lower 95% CI	Upper 95% CI
Cemented	29,174	271068.9	1,725	0.64	0.61	0.67
Uncemented	68,899	528541.3	3,718	0.70	0.68	0.73
Hybrid	66,290	506491.9	3,015	0.60	0.57	0.62



Revision for Arthroplasty Fixation vs Age Bands

Cemented	N	Sum comp. Years	Events	Rate/100-Component-Years	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Cemented						
<40	84	905.6	13	1.44	0.72	2.38
40-54	726	8263.3	160	1.94	1.64	2.25
55-64	2,776	33368.0	391	1.17	1.06	1.29
65-74	9,857	108384.5	728	0.67	0.62	0.72
>=75	15,731	120147.4	433	0.36	0.33	0.40
Uncemented						
<40	2,037	19754.6	187	0.95	0.81	1.09
40-54	15,464	140223.2	1,147	0.82	0.77	0.87
55-64	24,731	197740.8	1,388	0.70	0.67	0.74
65-74	19,278	130675.2	743	0.57	0.53	0.61
>=75	7,389	40147.4	253	0.63	0.55	0.71
Hybrid						
<40	460	5015.6	50	1.00	0.73	1.30
40-54	4,535	45294.9	501	1.11	1.01	1.21
55-64	13,794	129180.4	896	0.69	0.65	0.74
65-74	26,527	206104.6	1,027	0.50	0.47	0.53
>=75	20,974	120896.3	541	0.45	0.41	0.49

All	Years	% Revision-free	N
	1	98.77	150,584
	2	98.33	138,650
	3	97.90	126,723
	4	97.52	115,151
	5	97.13	103,623
	6	96.70	92,697
	7	96.21	82,348
	8	95.73	72,355
	9	95.15	63,251
	10	94.50	54,746
	11	93.79	47,061
	12	93.06	39,664
	13	92.22	33,100
	14	91.36	27,250
	15	90.49	21,976
	16	89.48	17,497
	17	88.46	13,382
	18	87.59	9,855
	19	86.69	7,024
	20	85.91	4,810



Cemented

Years	% Revision-free	N
1	99.17	27,397
2	98.73	26,040
3	98.37	24,515
4	98.03	22,863
5	97.72	21,216
6	97.38	19,479
7	96.87	17,638
8	96.34	15,736
9	95.75	13,997
10	94.89	12,221
11	93.97	10,652
12	93.01	9,222
13	91.88	7,920
14	90.79	6,690
15	90.03	5,565
16	89.05	4,561
17	87.84	3,542
18	87.08	2,683
19	86.05	1,985
20	85.01	1,410

Uncemented

Years	% Revision-free	N
1	98.57	62,652
2	98.07	57,358
3	97.59	52,127
4	97.09	47,180
5	96.62	42,243
6	96.07	37,747
7	95.53	33,573
8	95.01	29,543
9	94.36	25,781
10	93.74	22,354
11	93.07	19,091
12	92.41	15,651
13	91.67	12,607
14	90.96	10,054
15	90.18	7,893
16	89.28	6,086
17	88.45	4,605
18	87.68	3,359
19	86.88	2,351
20	86.40	1,588

Hybrid

Years	% Revision-free	N
1	98.81	60,535
2	98.41	55,252
3	98.02	50,081
4	97.73	45,108
5	97.40	40,164
6	97.04	35,471
7	96.62	31,137
8	96.22	27,076
9	95.71	23,473
10	95.15	20,171
11	94.53	17,318
12	93.86	14,791
13	93.09	12,573
14	92.24	10,506
15	91.22	8,518
16	90.06	6,850
17	89.02	5,235
18	87.98	3,813
19	87.07	2,688
20	86.25	1,812

Revision Rate vs Bearing Surfaces of Primary THA

Surfaces	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
Ceramic-Ceramic	15,634	133906.2	636	0.47	0.44	0.51
Ceramic-Metal	599	5314.8	38	0.71	0.50	0.97
Ceramic - Poly	46,900	291411.6	1,631	0.56	0.53	0.59
Metal -Metal	6,522	84880.9	1,144	1.35	1.27	1.43
Metal -Poly	89,777	745939.1	4,716	0.63	0.61	0.65

Revision for dislocation vs Surgical Approach for Primary THA

Approach	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
Anterior	5,655	49049.1	56	0.11	0.09	0.15
Posterior	111,638	849595.9	1,331	0.16	0.15	0.17
Lateral	36,083	323567.2	246	0.08	0.07	0.09

Summary of Revision Rate by Head Size of Primary THA

Size	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
<=28	66,019	722492.3	4,938	0.68	0.66	0.70
32	63,572	366451.7	1,789	0.49	0.47	0.51
36	28,336	161619.2	936	0.58	0.54	0.62
>36	4,050	32704.1	648	1.98	1.83	2.14

Revision Rate by Bearing Surface and Head Size of Primary THA

Size	Surfaces	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% Confidence Interval	
<=28	Ceramic-Ceramic	816	9981.3	62	0.62	0.47	0.79
<=28	Ceramic-Metal	144	461.8	6	1.30	0.48	2.83
<=28	Ceramic - Poly	12,836	138761.8	896	0.65	0.60	0.69
<=28	Metal -Metal	3384	48699.2	357	0.73	0.66	0.81
<=28	Metal -Poly	47,155	504696.5	3,478	0.69	0.67	0.71
32	Ceramic-Ceramic	4,160	41149.6	185	0.45	0.39	0.52
32	Ceramic - Poly	21,640	103613.3	473	0.46	0.42	0.50
32	Metal -Metal	481	5968.6	50	0.84	0.62	1.10
32	Metal -Poly	36,704	213883.2	1,072	0.50	0.47	0.53
36	Ceramic-Ceramic	8,360	68035.1	328	0.48	0.43	0.54
36	Ceramic-Metal	441	4757.2	32	0.67	0.45	0.94
36	Ceramic - Poly	12,021	48201.7	251	0.52	0.46	0.59
36	Metal -Metal	1,003	12609.6	151	1.20	1.01	1.40
36	Metal -Poly	5,863	26970.7	165	0.61	0.52	0.71
>36	Ceramic-Ceramic	2,259	14617.2	61	0.42	0.32	0.54
>36	Ceramic-Metal	7	82.1	0	0.00	0.00	4.49
>36	Ceramic - Poly	38	92.0	2	2.17	0.00	7.85
>36	Metal -Metal	1,648	17569.5	584	3.32	3.06	3.60
>36	Metal -Poly	39	258.3	1	0.39	0.00	2.16



Revision Rate by Age Band and Bearing Surface of Primary THA

Bearing Surface	Age Bands	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% Confidence Interval	
Ceramic-Ceramic	<40	867	7098.4	42	0.59	0.42	0.79
	40-54	5,163	45218.4	249	0.55	0.48	0.62
	55-64	6,252	55252.0	221	0.40	0.35	0.46
	65-74	2,998	24220.3	113	0.47	0.38	0.56
	>=75	354	2117.1	11	0.52	0.26	0.93
Ceramic-Metal	<40	14	145.0	3	2.07	0.43	6.05
	40-54	187	1879.0	10	0.53	0.26	0.98
	55-64	244	2269.4	19	0.84	0.49	1.28
	65-74	120	856.9	5	0.58	0.16	1.28
	>=75	34	164.4	1	0.61	0.00	3.39
Ceramic - Poly	<40	781	5924.5	60	1.01	0.77	1.30
	40-54	7,677	53958.3	404	0.75	0.68	0.83
	55-64	16,256	106249.6	584	0.55	0.51	0.60
	65-74	15,820	94367.6	434	0.46	0.42	0.50
	>=75	6,366	30911.7	149	0.48	0.41	0.57
Metal -Metal	<40	433	6805.0	80	1.18	0.93	1.45
	40-54	2,496	35870.5	483	1.35	1.23	1.47
	55-64	2,411	31599.7	473	1.50	1.36	1.64
	65-74	823	8612.8	92	1.07	0.86	1.31
	>=75	359	1992.9	16	0.80	0.46	1.30
Metal -Poly	<40	404	4821.2	51	1.06	0.78	1.38
	40-54	4,633	49981.2	602	1.20	1.11	1.30
	55-64	14,992	152780.5	1,279	0.84	0.79	0.88
	65-74	34,192	301211.6	1,768	0.59	0.56	0.61
	>=75	35,556	237144.7	1,016	0.43	0.40	0.46

Revision Rate by Bearing Surface stratifying Standard vs Cross linked Polyethylene

Surface	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% Confidence Interval	
Ceramic - Poly						
CP - All	46,900	291411.6	1,631	0.56	0.53	0.59
CP-PS	7,455	95509.1	739	0.77	0.72	0.83
CP-PX	39,445	195902.5	892	0.46	0.43	0.49
Metal -Poly						
MP - All	89,777	745939.1	4,716	0.63	0.61	0.65
MP-PS	37,472	399834.5	3,035	0.76	0.73	0.79
MP-PX	52,305	346104.6	1,681	0.49	0.46	0.51
Non-Poly						
CC	15,634	133906.2	636	0.47	0.44	0.51
CM	599	5314.8	38	0.71	0.50	0.97
MM	6,522	84880.9	1,144	1.35	1.27	1.43

Revision Rate by Bearing Surface of Primary Cemented THA

Surfaces	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
CP	931	7894.8	59	0.75	0.57	0.96
MM	49	444.7	3	0.67	0.14	1.97
MP	26,638	244266.0	1,562	0.64	0.61	0.67

Revision Rate by Bearing Surfaces of Primary Uncemented THA

Surfaces	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
CC	12,179	105853.5	523	0.49	0.45	0.54
CM	528	5127.8	35	0.68	0.48	0.95
CP	31,080	189323.8	1,058	0.56	0.53	0.59
MM	5,452	74345.6	1,037	1.39	1.31	1.48
MP	18,190	145282.7	1,002	0.69	0.65	0.73

Revision Rate by Bearing Surfaces of Primary Hybrid THA

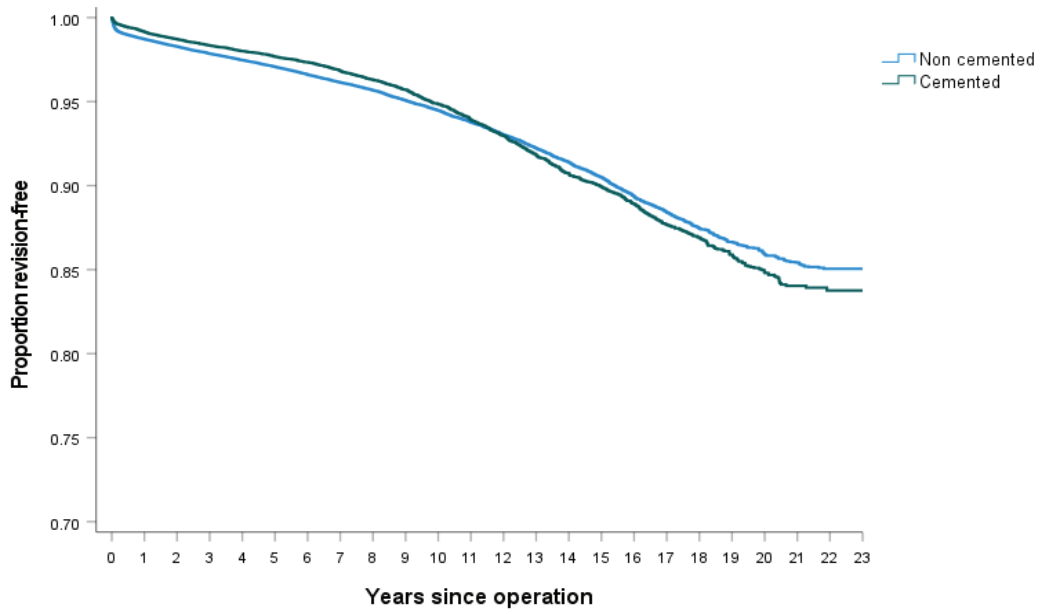
Surfaces	No. Ops.	Observed comp. yrs	Number Revised	Rate/100 Component years	Exact 95% confidence Interval	
CC	3,453	28051.8	113	0.40	0.33	0.48
CM	70	186.3	3	1.61	0.33	4.71
CP	14,889	94193.1	514	0.55	0.50	0.59
MM	1,021	10090.5	104	1.03	0.84	1.24
MP	44,949	356390.4	2,152	0.60	0.58	0.63



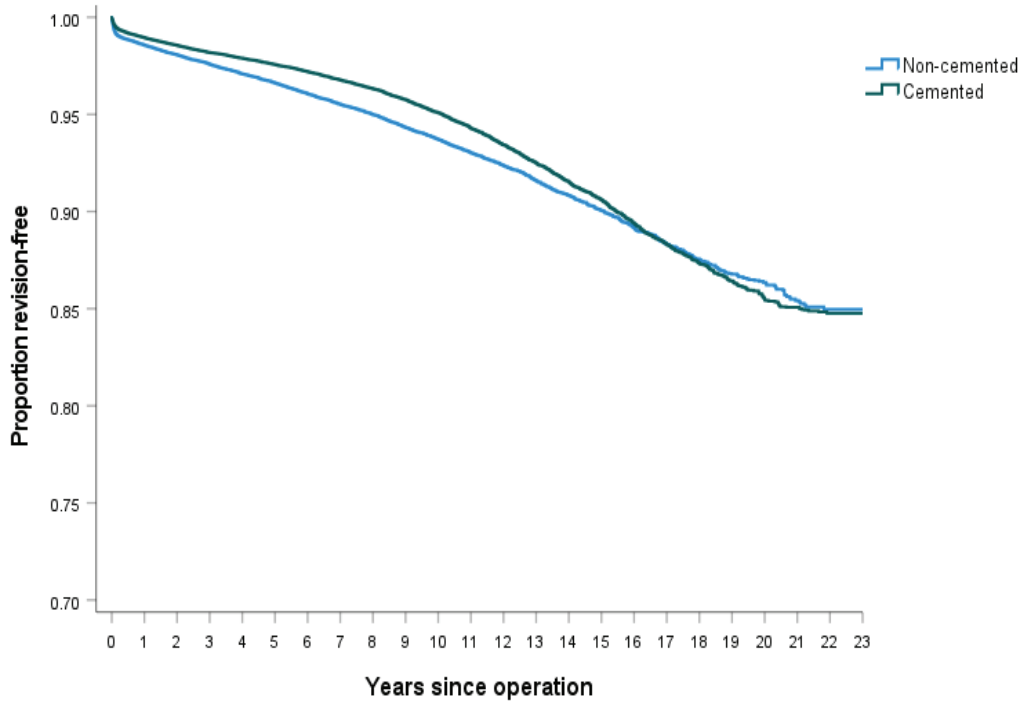
Revision vs Bearing Surface Options for 6 Acetabulae in common use

Acetabular Surface		No. Ops	Observed comp. yrs	No. revised	Rate/100 Component years	Lower 95% CI	Upper 95% CI
RM Pressfit cup	MM	333	4032.3	33	0.82	0.55	1.13
	PS	5,243	44312.1	242	0.55	0.48	0.62
	PX	2,261	9543.8	62	0.65	0.49	0.83
	P	7,504	53856.0	304	0.56	0.50	0.63
Pinnacle	CC	3,556	28787.3	127	0.44	0.37	0.52
	MM	1,061	13661.6	164	1.20	1.02	1.39
	PS	14	101.5	2	1.97	0.24	7.12
	PX	7,720	49728.3	245	0.49	0.43	0.56
	P	7,734	49829.8	247	0.50	0.44	0.56
R3 porous	CC	1,011	7957.7	22	0.28	0.17	0.41
	MM	110	971.0	52	5.36	4.00	7.02
	P	4,729	24236.9	121	0.50	0.41	0.60
Trident	CC	2,547	31164.9	120	0.39	0.32	0.46
	MM	171	510.9	4	0.78	0.21	2.00
	PS	1	15.9	0	0.00	0.00	23.18
	PX	15,953	107815.1	493	0.46	0.42	0.50
	P	15,954	107831.1	493	0.46	0.42	0.50
Tritanium	CC	112	852.6	1	0.12	0.00	0.65
	MM	146	506.4	5	0.99	0.32	2.30
	P	5,838	30887.9	157	0.51	0.43	0.59
Trilogy	CC	67	1006.2	6	0.60	0.22	1.30
	MM	5	66.8	0	0.00	0.00	5.52
	PS	148	2296.8	15	0.65	0.37	1.08
	PX	6,679	58349.9	271	0.46	0.41	0.52
	P	6,827	60646.7	286	0.47	0.42	0.53

Survivorship by Acetabular Fixation of Primary THA



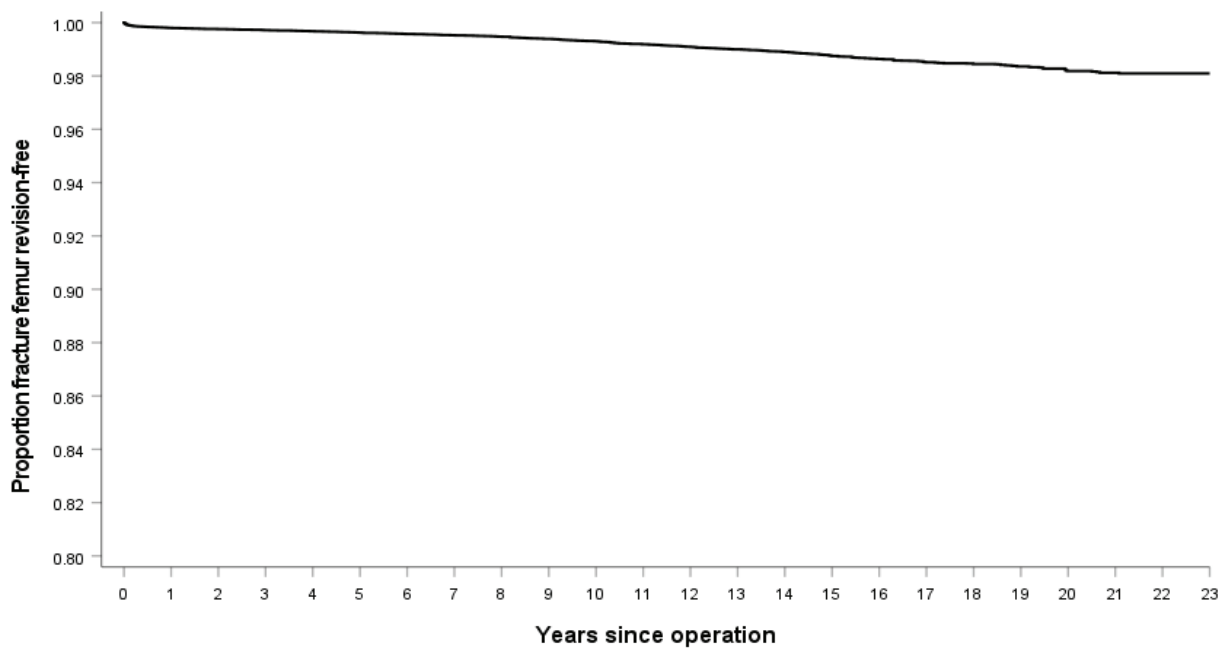
Survivorship by Femur Fixation of Primary THA



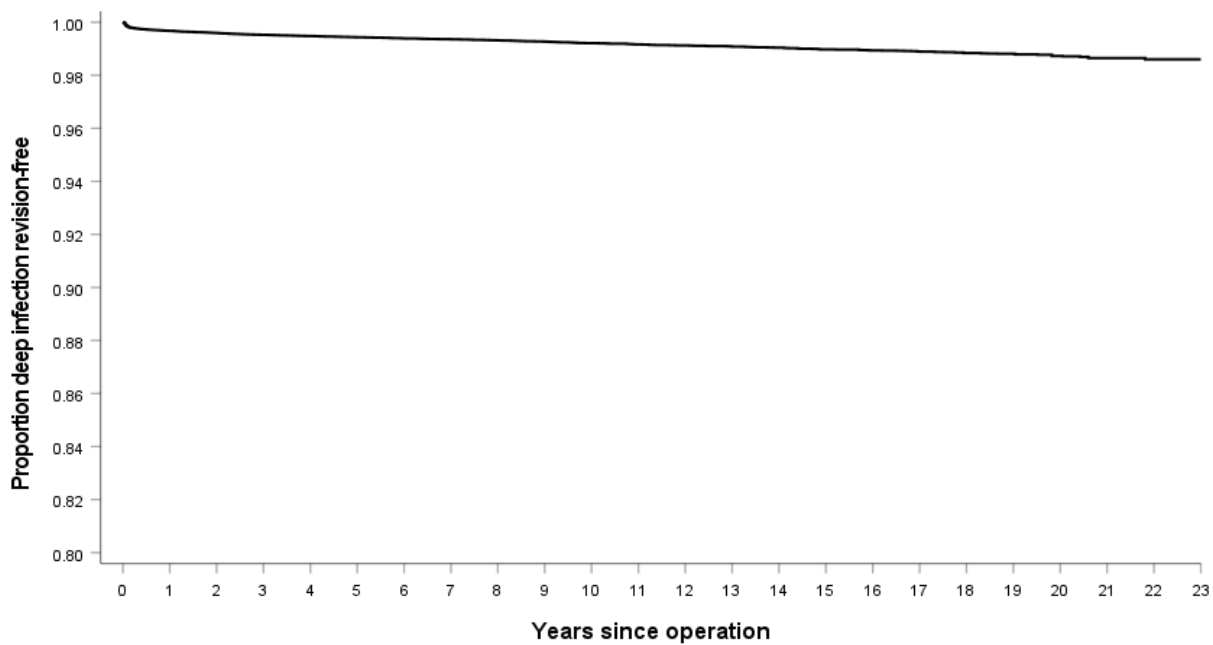


The following Kaplan Meier graphs are for the six main individual reasons for revision:

Fracture femur



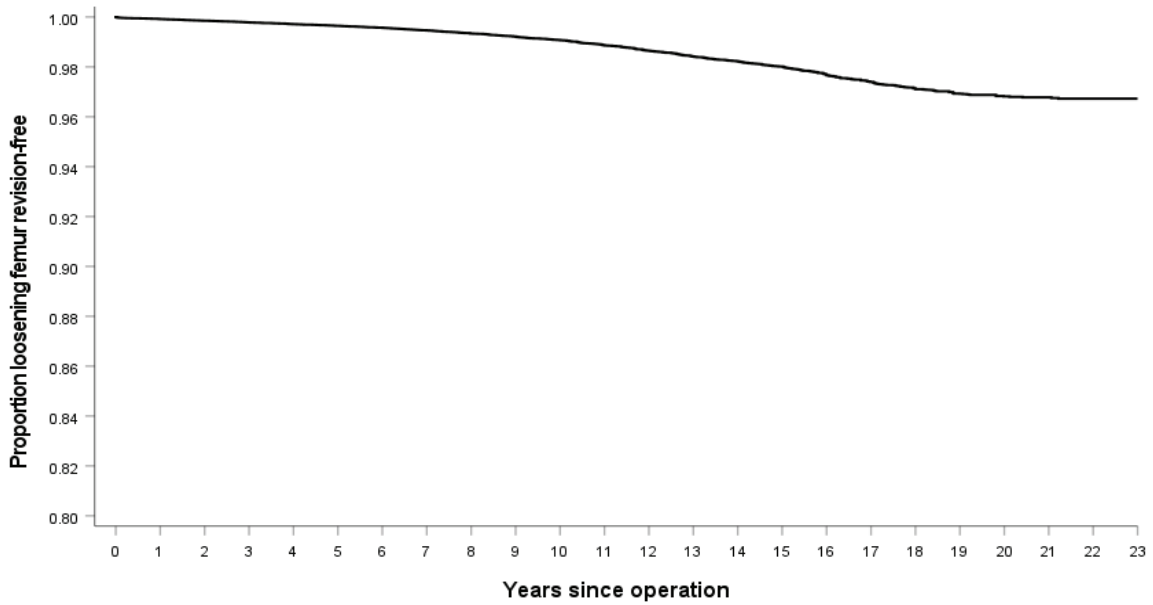
Deep infection



Pain

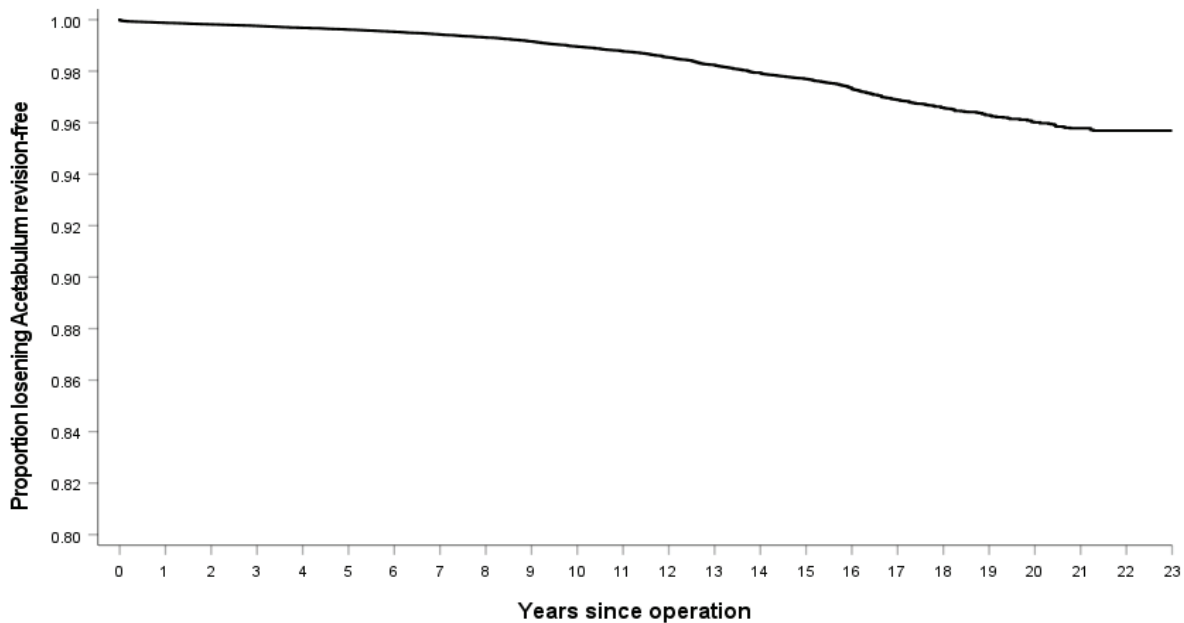


Loosening femoral component

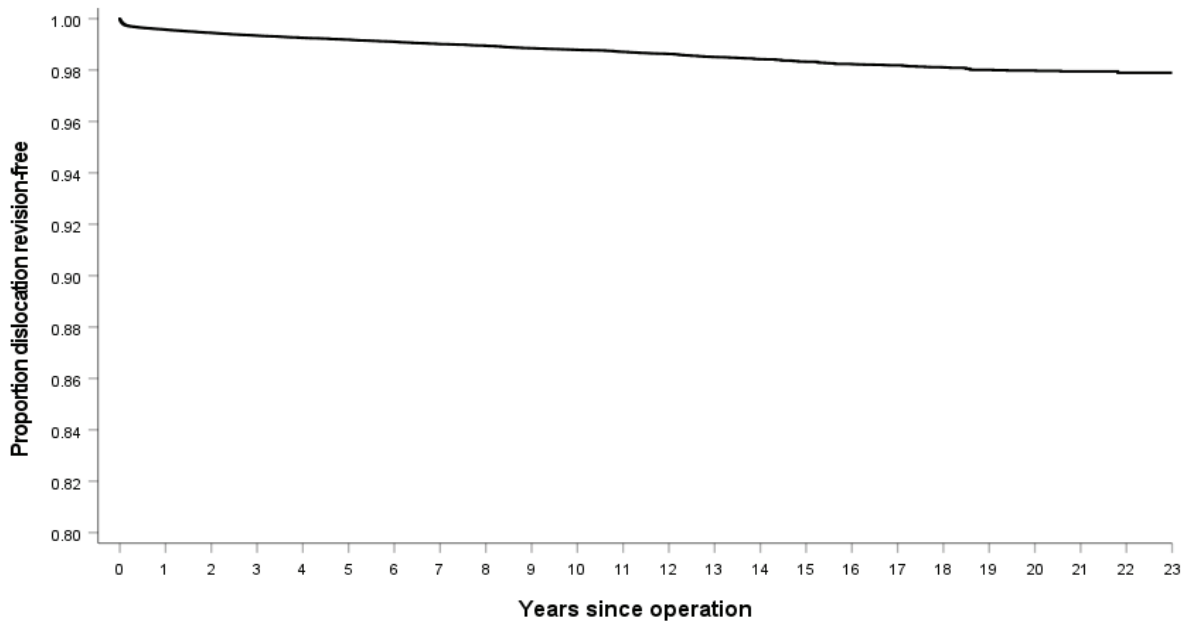




Loosening acetabular component



Dislocation



RESURFACED HIP ANALYSES

There were 2,200 resurfacing hips registered for the period 2000 – 2021, with 170 revised.

N	Sum comp. Years	Number Revised	Rate/100-component-years	Exact 95% Confidence Interval	
2,200	19646.5	170	0.87	0.74	1.01

Revision Rate by RHA Prosthesis

Prosthesis	N	Sum comp. Years	Number Revised	Rate/100-component-years	Exact 95% Confidence Interval	
Adept	4	55.1	0	0.00	0.00	6.69
ASR	132	1575.1	45	2.86	2.08	3.82
BHR	2,017	17523.4	117	0.67	0.55	0.80
BMHR	28	291.2	2	0.69	0.08	2.48
Conserve Superfinish	3	37.6	0	0.00	0.00	9.81
Durom	4	65.5	0	0.00	0.00	5.63
Mitch TRH Resurfacing Head	12	98.6	6	6.09	1.93	12.54

Revision Rate by RHA Head Size

Head Size	No. Ops.	Observed comp. years	Number Revised	Rate/100-component-years	Exact 95% Confidence Interval	
<=44	99	1031.3	33	3.20	2.20	4.49
45-49	404	3927.6	55	1.40	1.05	1.82
50-54	1,591	13564.5	72	0.53	0.42	0.67
>=55	106	1123.1	10	0.89	0.43	1.64

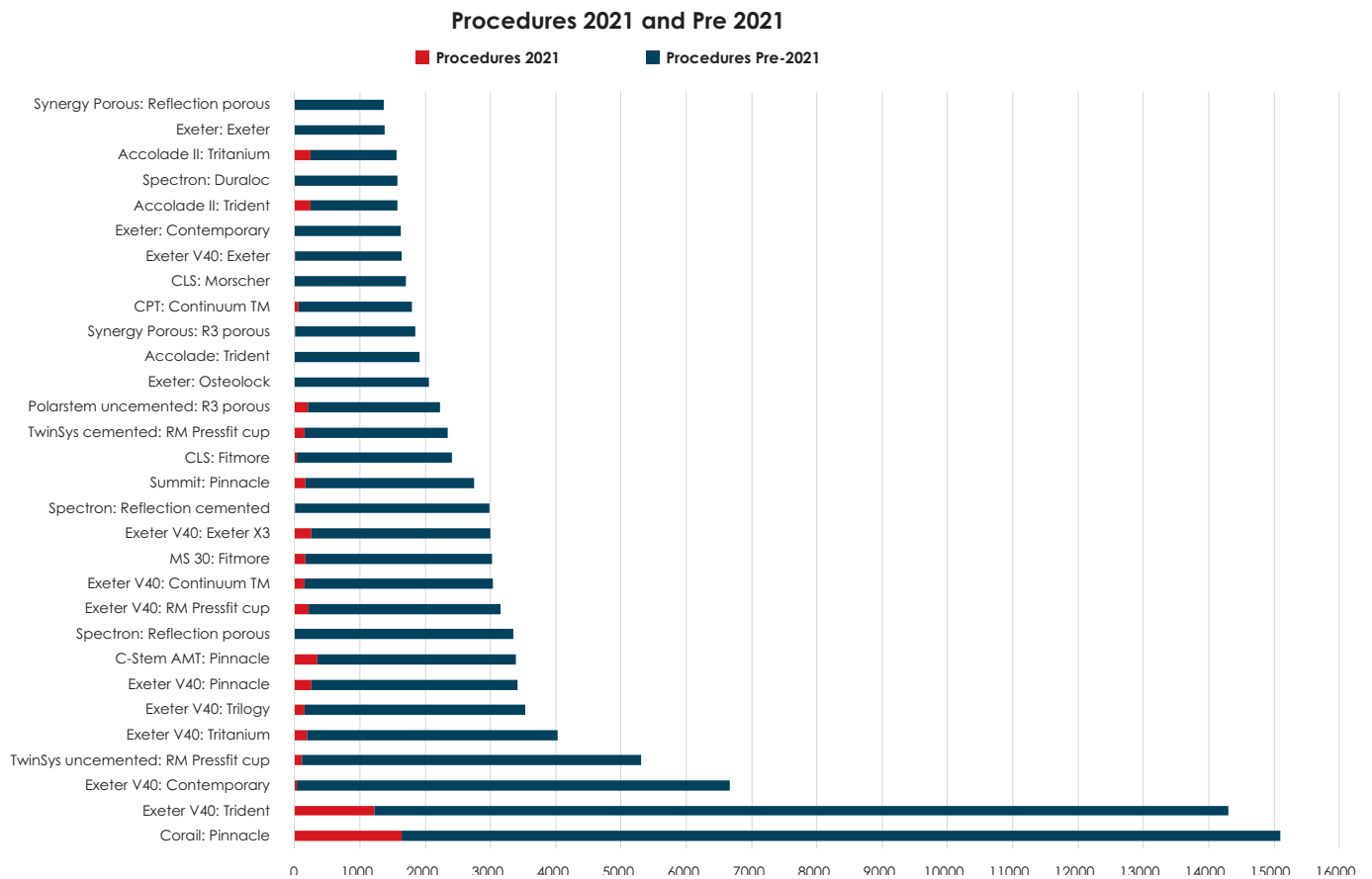
Time to revision for resurfaced hips	N
Average	2,204 days (6.0 years)
Maximum	6,084 days
Minimum	10 days

Reason for revision	N
Pain	55
Loosening acetabulum	19
Deep infection	19
Loosening femoral component	19
Fracture femur	23
Dislocation/instability	2

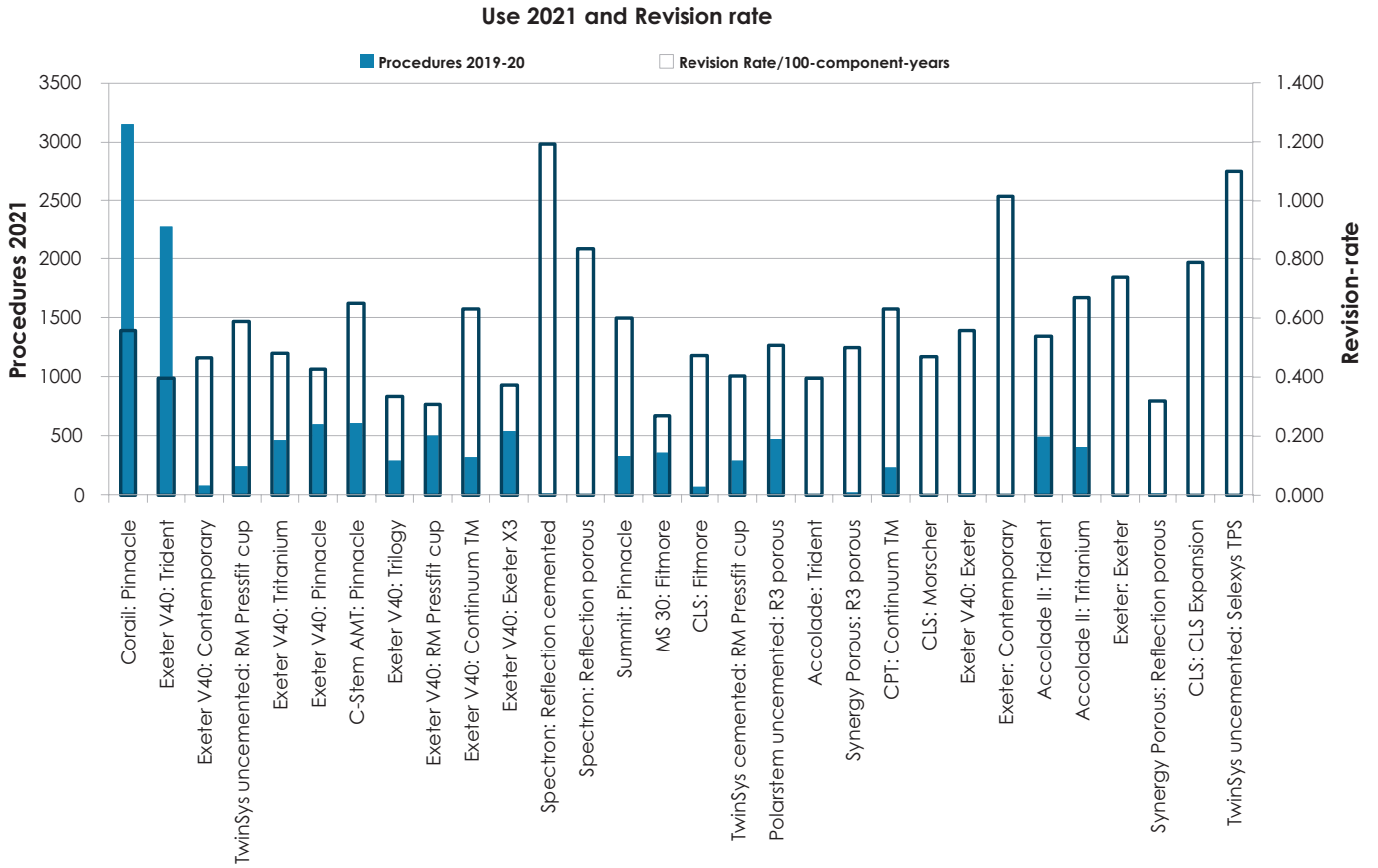


THA PROSTHESIS COMBINATIONS

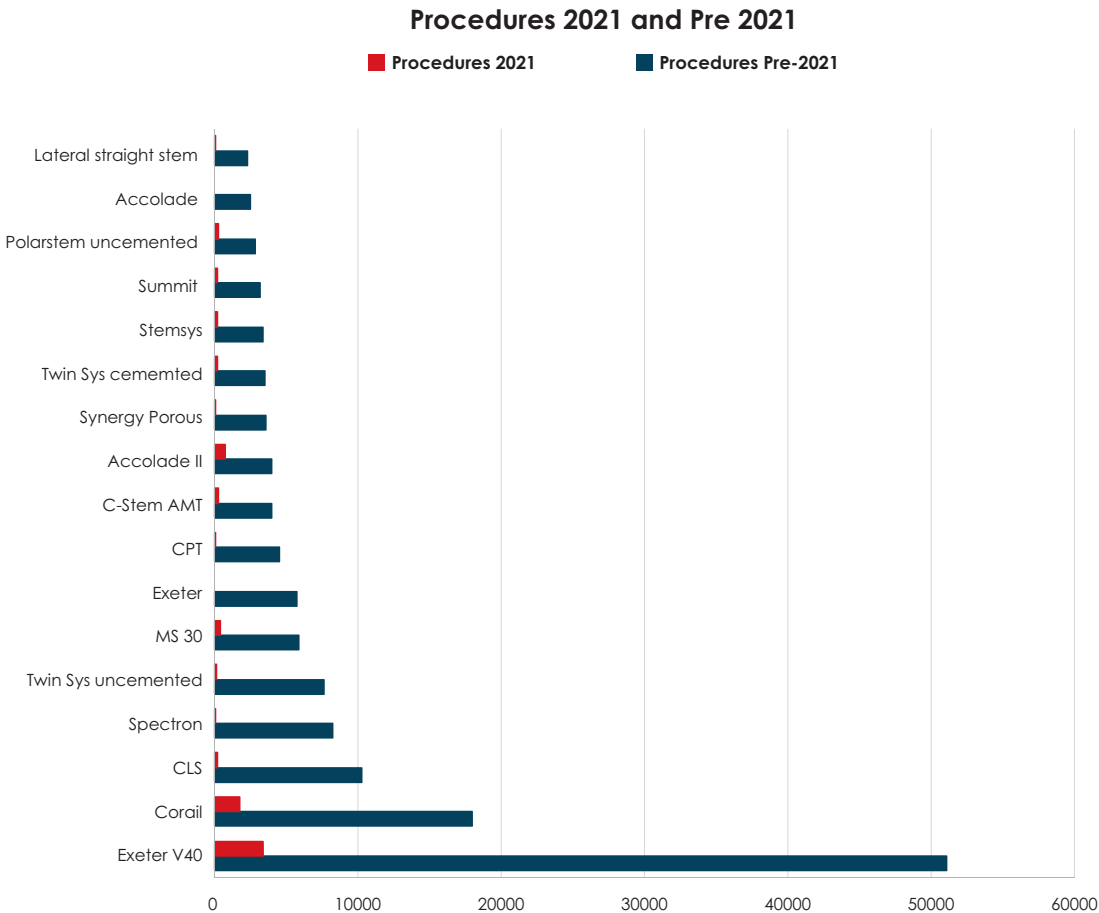
The figure below summarises the 30 Hip prostheses combinations with >1000 procedures, showing the number of procedures for the history of the Registry.



The figure below summarises the number of procedures for hip prostheses combinations in 2021 along with the revision rate.

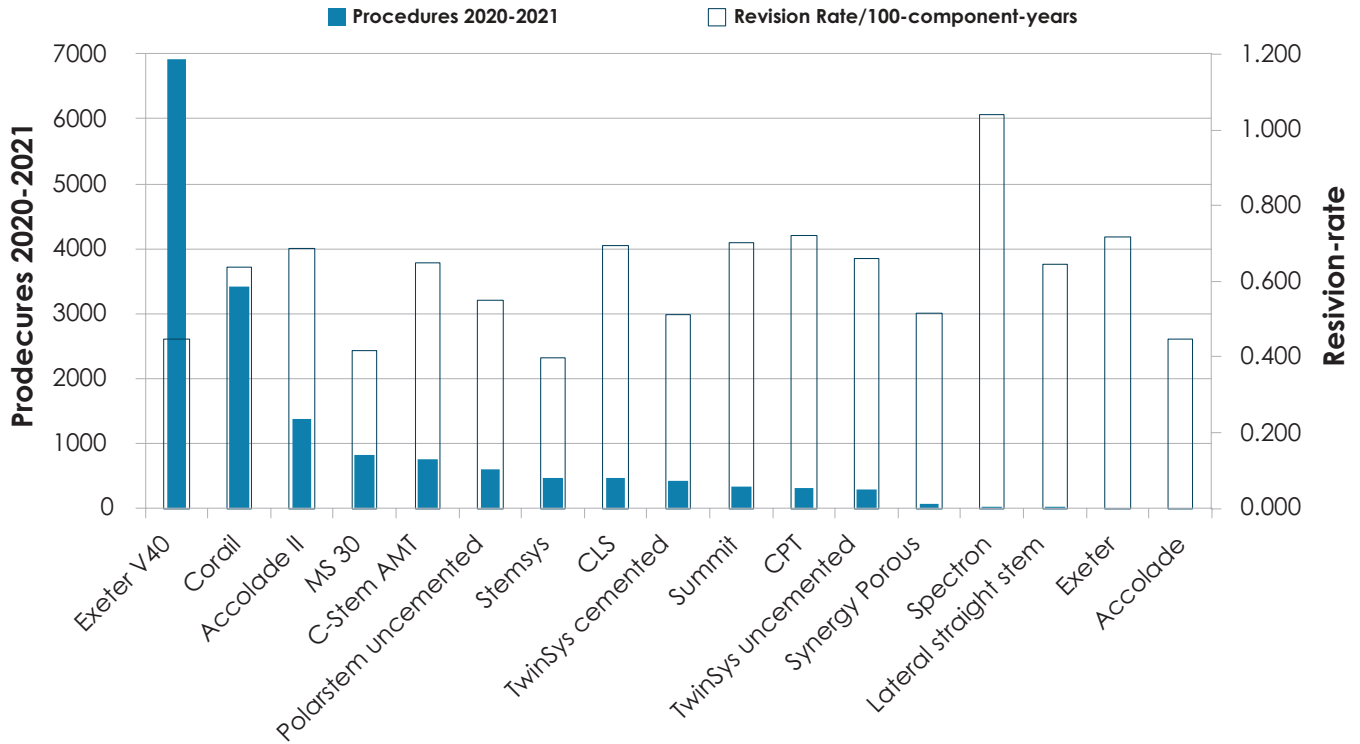


The figure below summarises the 17 Hip femur prostheses with >2000 procedures. Showing the number of procedures for the history of the registry and for the previous 2 years.

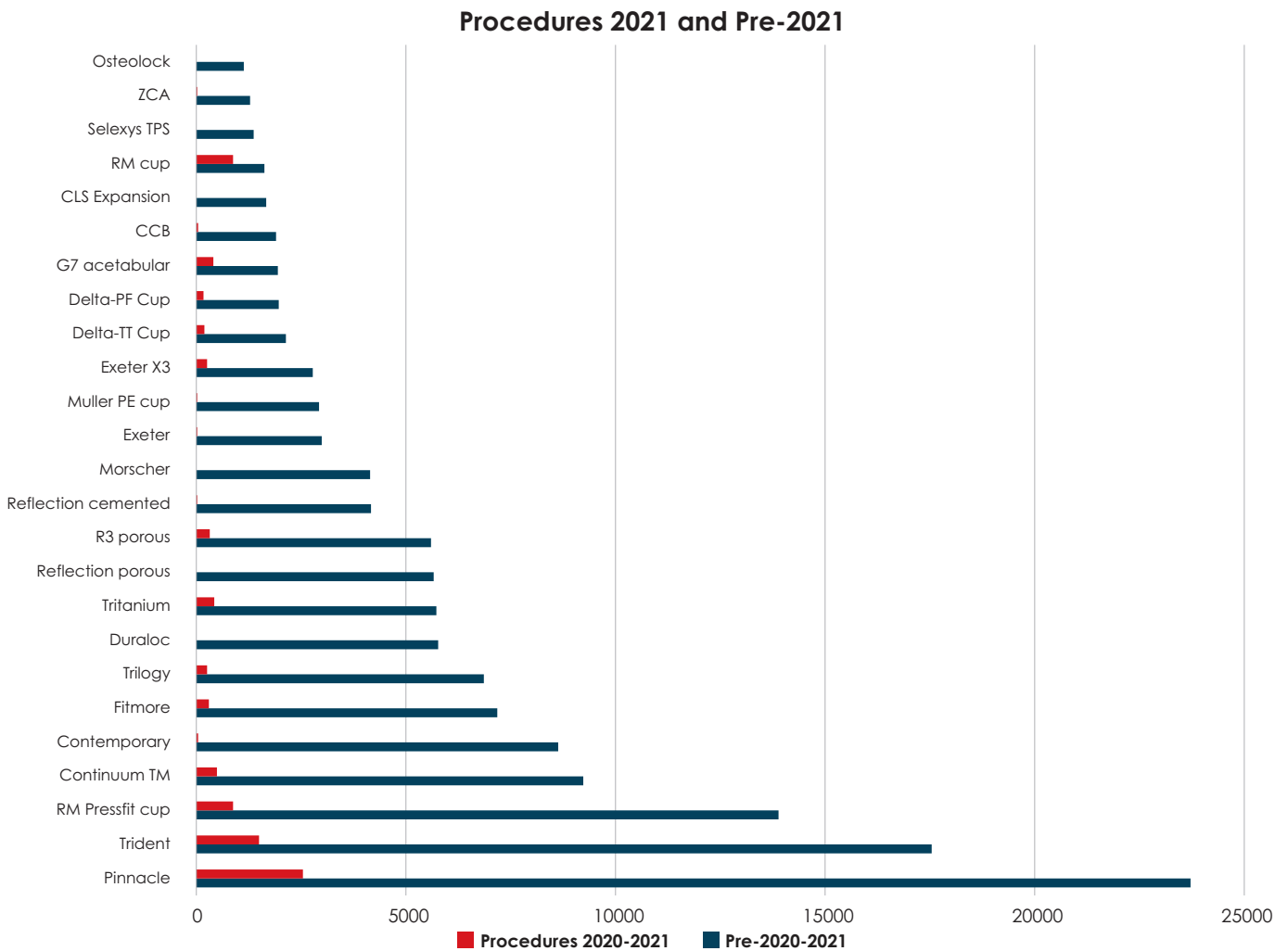




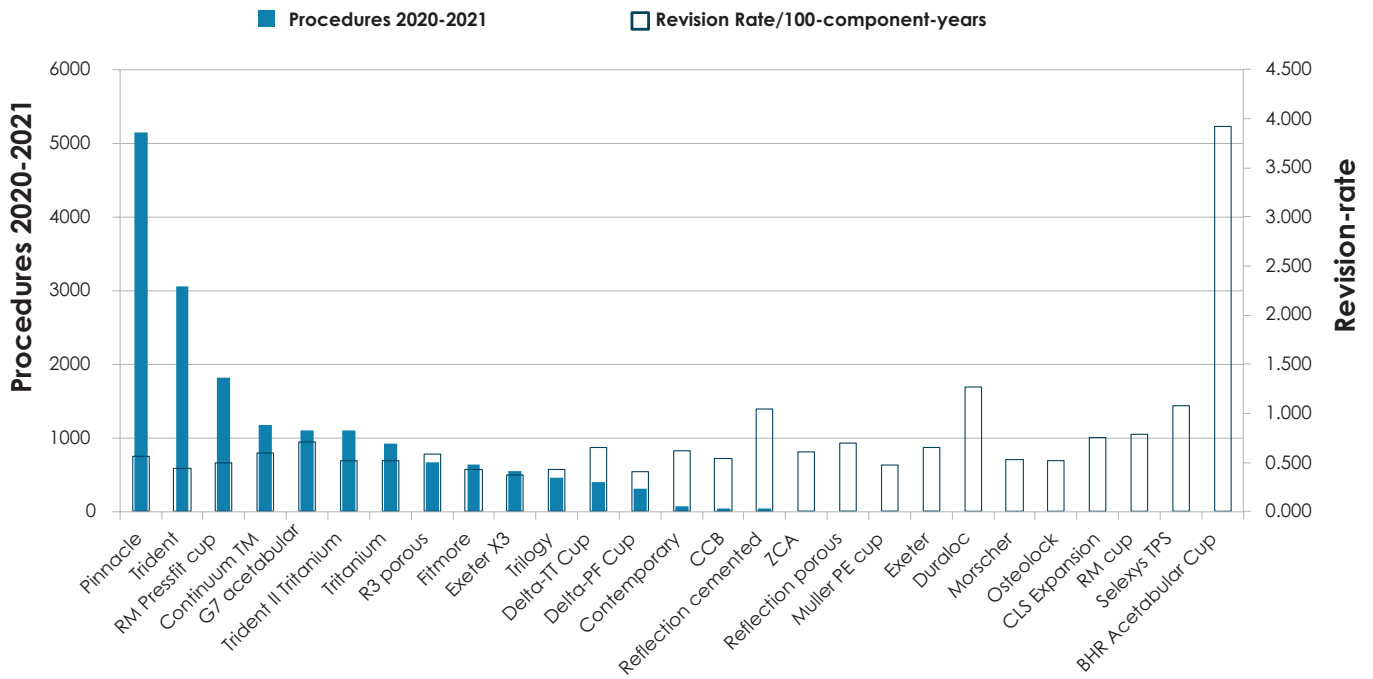
The figure below summarises the 17 Hip femur prostheses with >2000 procedures. Showing the number of procedures for the previous 2 years and the historical revision rate.



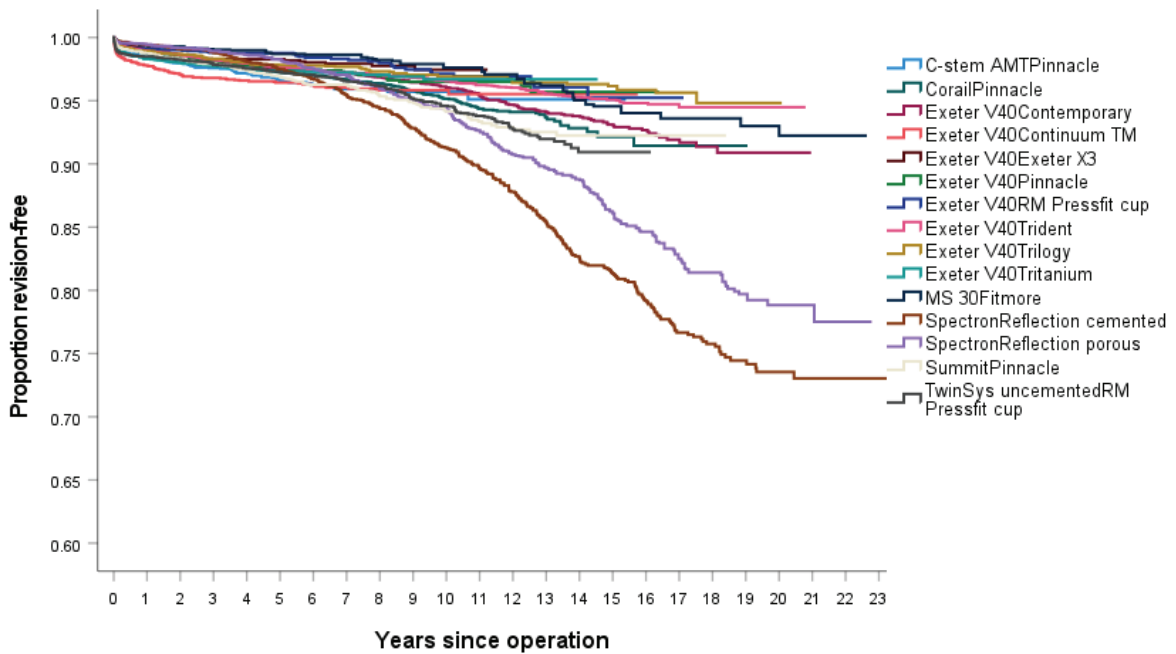
The figure below summarises the 25 Hip acetabular prostheses with >1000 procedures. Showing the number of procedures for the history of the registry and for the previous 2 years.



The figure below summarises the 27 Hip acetabular prostheses with >1000 procedures. Showing the number of procedures for the previous 2 years and the historical revision rate.



Survival of Femur and Acetabulum combinations with > 2500 procedures





RE-REVISIONS OF TOTAL HIPS

Registered primary THA procedures that had been revised more than once were analysed.

There were 1,430 registered total hip replacements that had been revised twice, 358 that had been revised three times, 09 that had been revised four times, 36 that had been revised 5 times and 12 that had been revised 6 times.

Second revision

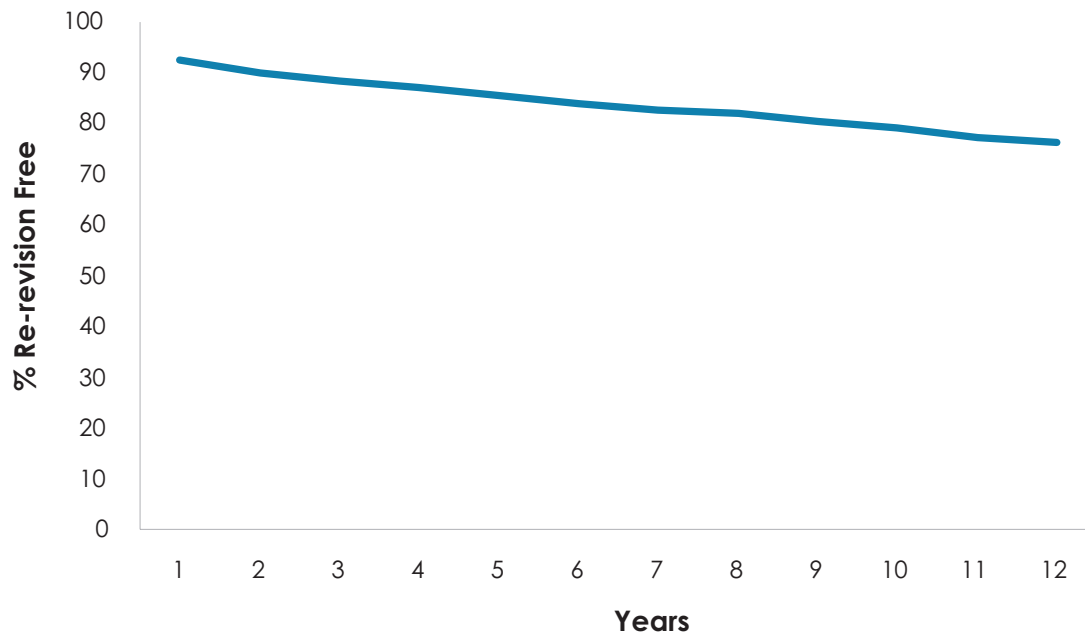
Time between the first and second revisions averaged 931 days (2.54 years) with a range of 0 – 7662 and a standard deviation of 1,258.

This compares to an average of 2,338 days (6.40 years) between the primary and first revision.

Percentage of hips re-revised by year from surgery

Years	Percentage re-revision free	Lower 95%	Upper 95%	N
1	92.40	91.62	93.18	4,585
2	89.80	89.02	90.58	3,838
3	88.30	87.32	89.28	3,225
4	86.90	85.92	87.88	2,610
5	85.50	84.52	86.48	2,092
6	83.90	82.72	85.08	1,597
7	82.60	81.42	83.78	1,234
8	81.80	80.43	83.17	938
9	80.30	78.73	81.87	686
10	79.10	77.34	80.86	496
11	77.30	75.34	79.26	353
12	76.20	74.04	78.36	252

Re-Revision of THA by Years from Surgery



Reason for revision	N
Deep infection	472
Dislocation/instability	365
Loosening femoral component	174
Loosening acetabulum component	165
Unexplained pain	127
Fracture femur	110
Poly wear	2

Procedure performed	N
Change of all	402
Change of femoral component	388
Change of acetabular shell	363
Change of liner	661
Change of head	946

Overall, it can be noted that the time between successive revisions steadily decreases.

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTHS, FIVE YEARS, TEN YEARS, FIFTEEN YEARS AND TWENTY YEARS POST-SURGERY

Questionnaires at six months post-surgery

At six months post-surgery a random selection of patients is sent the Oxford-12 questionnaire in order to achieve a response rate of 20% of the total which is deemed to be ample to provide powerful statistical analysis.

There are 12 questions with the scores now ranging from 4 to 48. A score of 48 is the best, indicating normal function. A score of 0 is the worst, indicating the most severe disability.

In addition, we have grouped the questionnaire responses according to the classification system published by Kalairajah et al, 2005 (see appendix 1).

This groups each score into four categories:

Category	Score	Interpretation
Category 1	>41	Excellent
Category 2	34 – 41	Good
Category 3	27 – 33	Fair
Category 4	< 27	Poor

For the twenty-two-year period, and as at July 2021, there were 36,598 primary hip questionnaire responses registered six months post-surgery. The average hip score was 40.36 (standard deviation 7.61, range 0-48).

Oxford Scores at 6 months	N
> 41	18,208
34 -41	9,030
27 -33	3,130
< 27	2,103

At six months post-surgery, 84% had an excellent or good score.

Questionnaires at five years post-surgery

All patients who had a six- month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at five years post-surgery.

This dataset represents sequential Oxford hip scores for 11,799 individual patients.

At five years post-surgery, 89% of these patients achieved an excellent or good score and had an average of 42.37.

Oxford Scores at 5 years	N
> 41	8,263
34 -41	2,257
27 -33	770
< 27	509

Questionnaires at ten years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at ten years post-surgery.

This dataset represents sequential Oxford hip scores for 8,062 individual patients.

At ten years post-surgery, 87% of these patients achieved an excellent or good score and had an average of 41.94.

Oxford Scores at 10 years	N
> 41	5,453
34 -41	1,600
27 -33	576
< 27	433

Questionnaires at fifteen years post-surgery

All patients who had a six- month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at fifteen years post-surgery.

This dataset represents sequential Oxford hip scores for 3,119 individual patients.

At fifteen years post-surgery, 86% of these patients achieved an excellent or good score and had an average of 41.37.

Oxford Scores at 15 years	N
> 41	2,052
34 -41	631
27 -33	231
< 27	200

Questionnaires at twenty years post-surgery

All patients who had a six- month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at twenty years post-surgery.

This dataset represents sequential Oxford hip scores for 1,695 individual patients.

At twenty years post-surgery, 83% of these patients achieved an excellent or good score and had an average of 40.67

Oxford Scores at 20 years	N
> 41	1,031
34 -41	369
27 -33	142
< 27	153

Oxford Hip Score at 6 months- post THA vs BMI

BMI	Mean	Standard Error of Mean	Number/ group
< 19	38.94	0.825	99
19 - 24	41.00	0.144	2,455
25 - 29	40.65	0.110	4,206
30 - 39	39.35	0.129	3,587
40+	37.17	0.464	329
Total	40.17	0.072	10,676

Revision hip questionnaire responses

There were 11,658 revision hip responses. This group includes all revision hip procedures including revisions of primary arthroplasties performed prior to 1999. The average revision hip score was 34.90 (standard deviation 9.92, range 2-48).

OXFORD 12 SCORE AS A PREDICTOR OF HIP ARTHROPLASTY REVISION

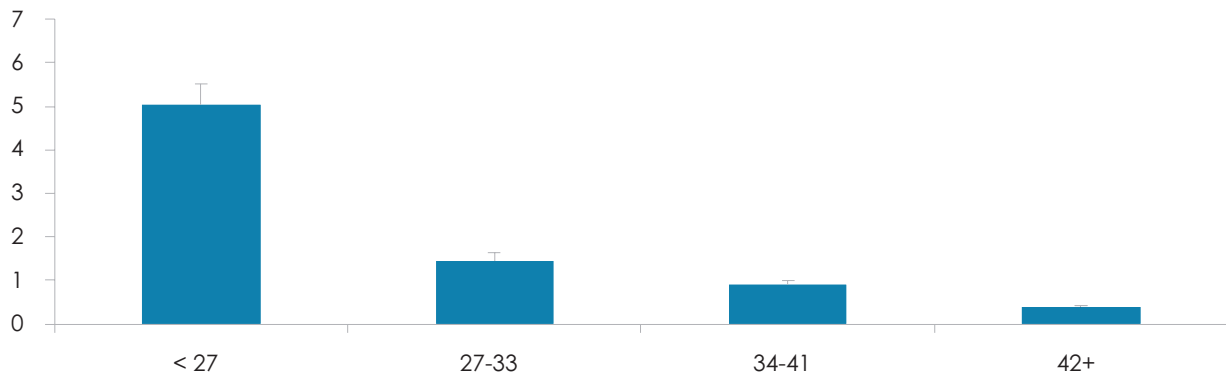
A statistically significant relationship has been confirmed between the Oxford scores at six months, five and ten- years post-surgery and arthroplasty revision within two years of the Oxford 12 questionnaire date.

Six month score and revision arthroplasty

By plotting the patients' six-month scores in the Kalairajah groupings against the proportion of hips revised for that same group it demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score.

A patient with a score below 27 has 13 times the risk of a revision within two years compared to a person with a score >42.

Revision (%) to 2 years by Oxford score at 6 months

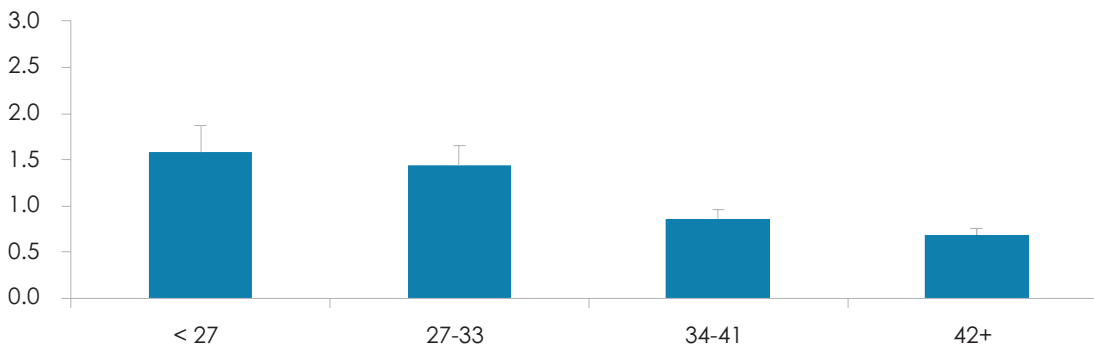


Oxford Score Classes

Revision risk versus Kalairajah groupings of Oxford scores within two years of the six-month score date.

Kalairajah grouping of Oxford Score at 6 months	Revision to 2 Years	No. revised	%	Std error
< 27	2,103	106	5.04	0.48
27-33	3,130	45	1.44	0.21
34-41	9,030	82	0.91	0.10
42+	18,208	71	0.39	0.05

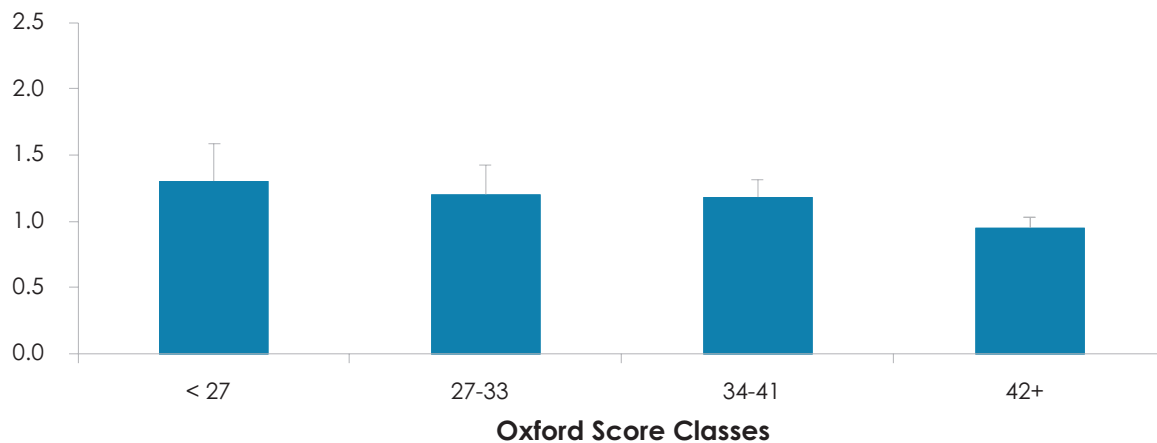
Revision (%) 2 to 4 years by Oxford score at 6 months





Kalairajah grouping of Oxford Score at 6 months	Revision 2 to 4 years	No. revised	%	Std error
< 27	1,838	29	1.58	0.29
27-33	2,724	39	1.43	0.23
34-41	8,014	69	0.86	0.10
42+	16,563	114	0.69	0.06

Revision (%) 4 to 6 years by Oxford score at 6 months



Kalairajah grouping of Oxford Score at 6 months	Revision 4 to 6 years	No. revised	%	Std error
< 27	1,539	20	1.30	0.29
27-33	2,333	28	1.20	0.23
34-41	6,912	82	1.19	0.13
42+	14,669	139	0.95	0.08

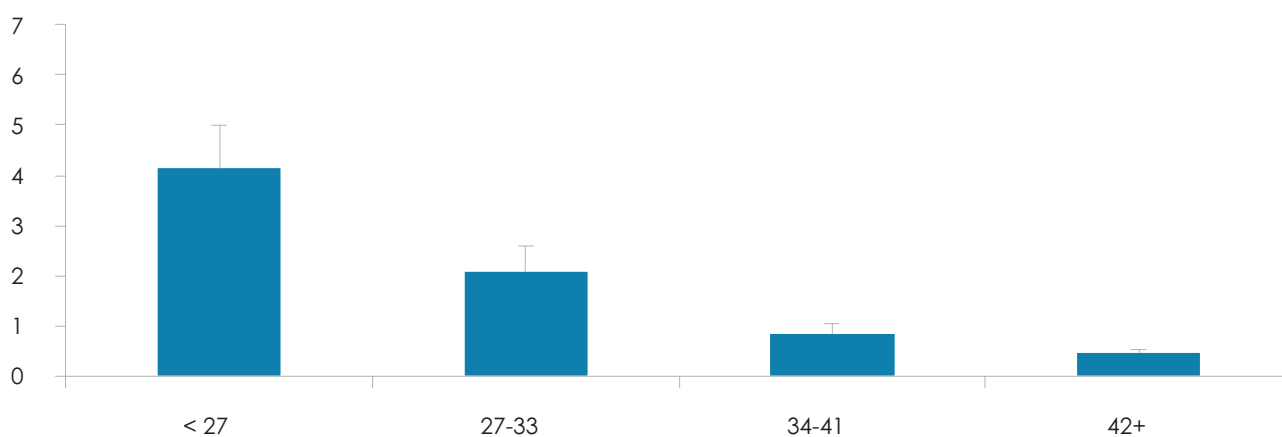
Five-year score and revision arthroplasty

As with the six-month scores, plotting the patients' five-year scores in the Kalairajah groupings against the proportion of hips revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 9 times the risk of a revision within two years compared to a person with a score >42.

Revision risk versus Kalairajah groupings of Oxford scores within two years of the five-year score date.

Kalairajah grouping of Oxford Score at 5 years	Revision to 2 Years	No. revised	%	Std error
< 27	509	21	4.13	0.88
27-33	770	16	2.08	0.51
34-41	2,257	19	0.84	0.19
42+	8,263	38	0.46	0.07

Revision (%) to 2 years by Oxford score at 5 years



Oxford Score Classes

Revision risk versus Kalairajah groupings of Oxford scores within two to four years of the five-year score date.

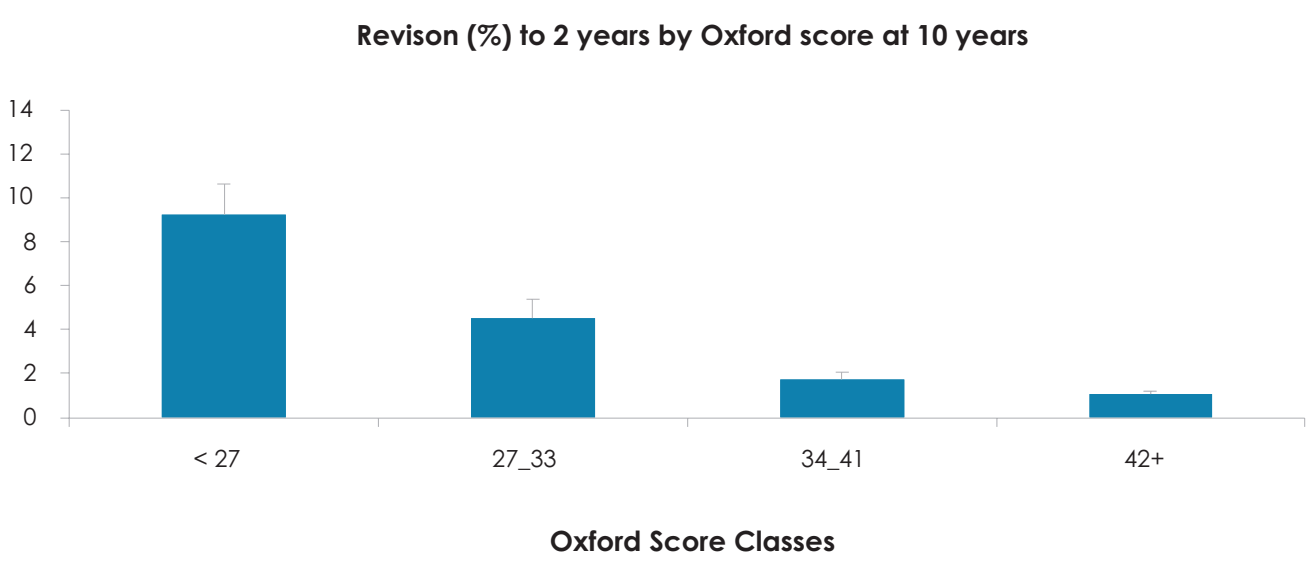
Kalairajah Group at 5 years	Revision 2 to 4 years	No. revised	%	Std error
< 27	413	6	1.45	0.59
27_33	626	10	1.60	0.50
34_41	1,875	27	1.44	0.28
42+	7,095	46	0.65	0.10



Ten-year score and revision arthroplasty

As with the six-month and five-year scores, plotting the patients' ten-year scores in the Kalairajah groupings against the proportion of hips revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 8 times the risk of a revision within two years compared to a person with a score >42.

Kalairajah grouping of Oxford Score at 10 years	Revision to 2 Years	No. revised	%	Std error
< 27	433	40	9.24	1.39
27-33	576	26	4.51	0.87
34-41	1,600	28	1.75	0.33
42+	5,453	57	1.05	0.14

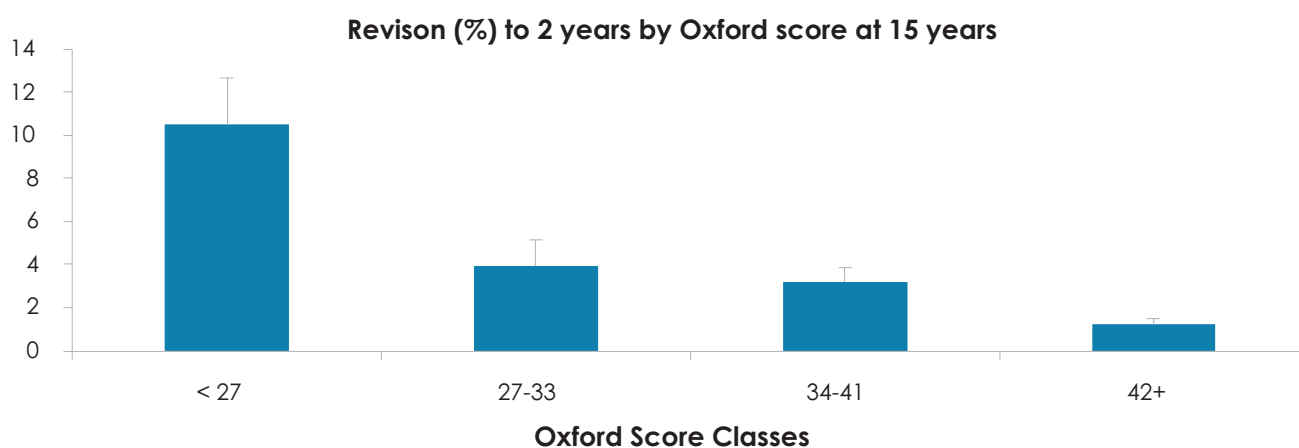


Revision risk versus Kalairajah groupings of Oxford scores within two years of the ten-year score date

Fifteen-year score and revision arthroplasty

As with the six- month, five- year and ten- year scores, plotting the patients' fifteen- year scores in the Kalairajah groupings against the proportion of hips revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 9 times the risk of a revision within two years compared to a person with a score >42.

Kalairajah groupings at 15 years	Revision to 2 years	No. revised	%	Std error
< 27	200	21	10.50	2.17
27-33	231	9	3.90	1.27
34-41	631	20	3.17	0.70
42+	2,052	25	1.22	0.24

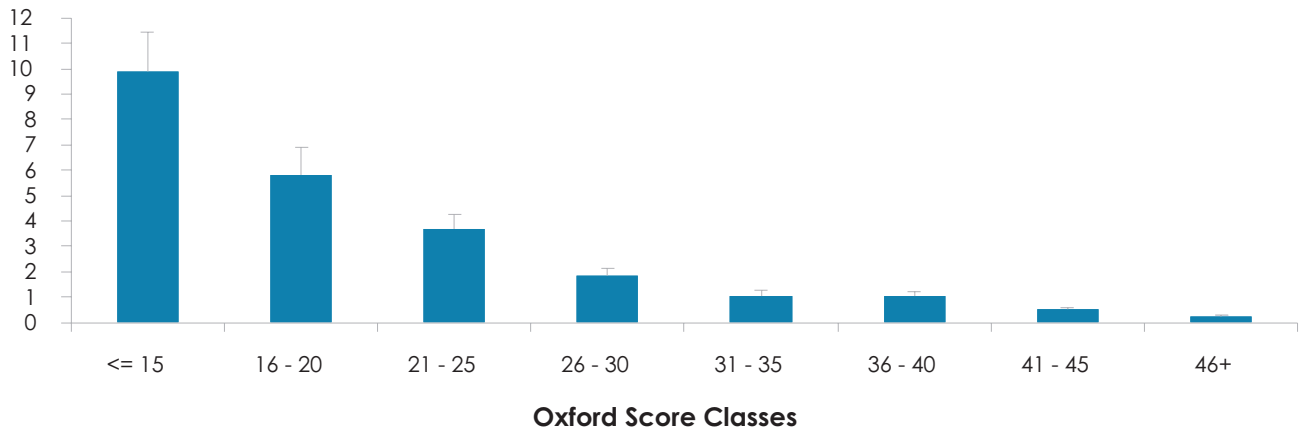


In view of the large number of six- month Oxford scores it is possible with statistical significance to further break down the score groupings to demonstrate an even more convincing relationship between score and risk of revision within two years.

Kalairajah grouping of Oxford Score at 6 months	Revision to 2 Years	No. revised	%	Std error
<= 15	374	37	9.89	1.54
16 - 20	464	27	5.82	1.09
21 - 25	982	36	3.67	0.60
26 - 30	1,813	33	1.82	0.31
31 - 35	3,187	34	1.07	0.18
36 - 40	5,716	60	1.05	0.13
41 - 45	10,368	54	0.52	0.07
46+	9,567	23	0.24	0.05

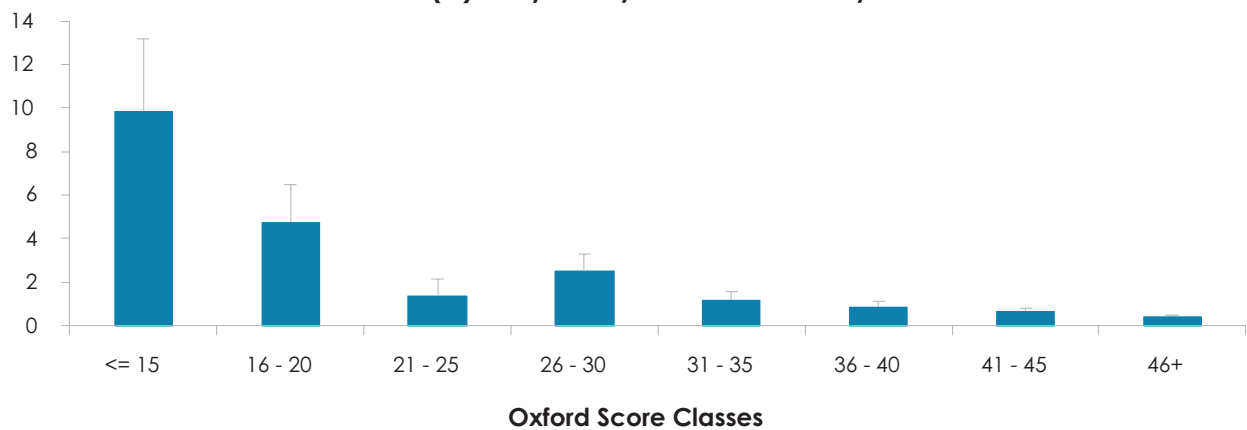


Revision (%) to 2 years by Oxford score at 6 months



Kalairajah grouping of Oxford Score at 5 years	Revision to 2 years	No. revised	%	Std error
<= 15	81	8	9.88	3.31
16 - 20	148	7	4.73	1.74
21 - 25	218	3	1.38	0.79
26 - 30	436	11	2.52	0.75
31 - 35	750	9	1.20	0.40
36 - 40	1,471	13	0.88	0.24
41 - 45	3,358	22	0.66	0.14
46+	5,337	21	0.39	0.09

Revision (%) to 2 years by Oxford score at 5 years

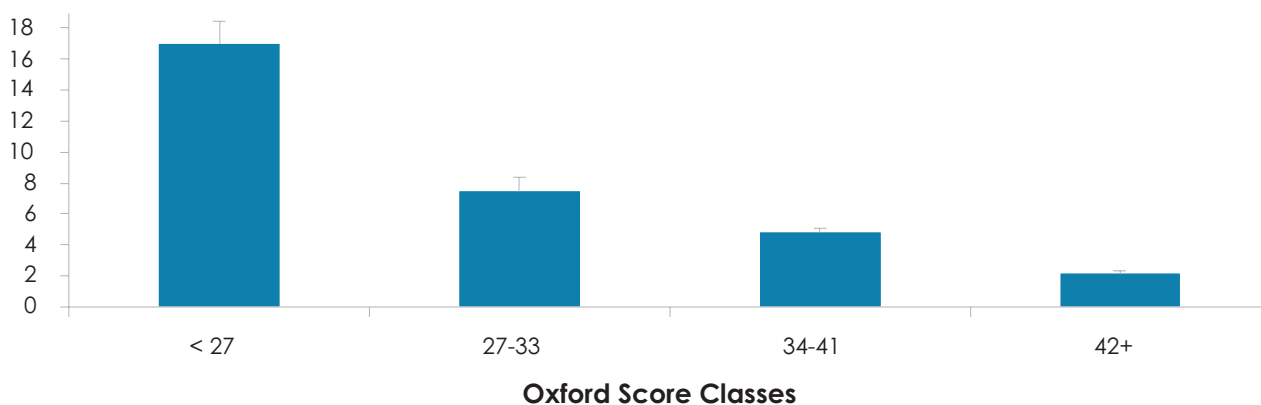


Prediction of second revision from six- month score following first Revision

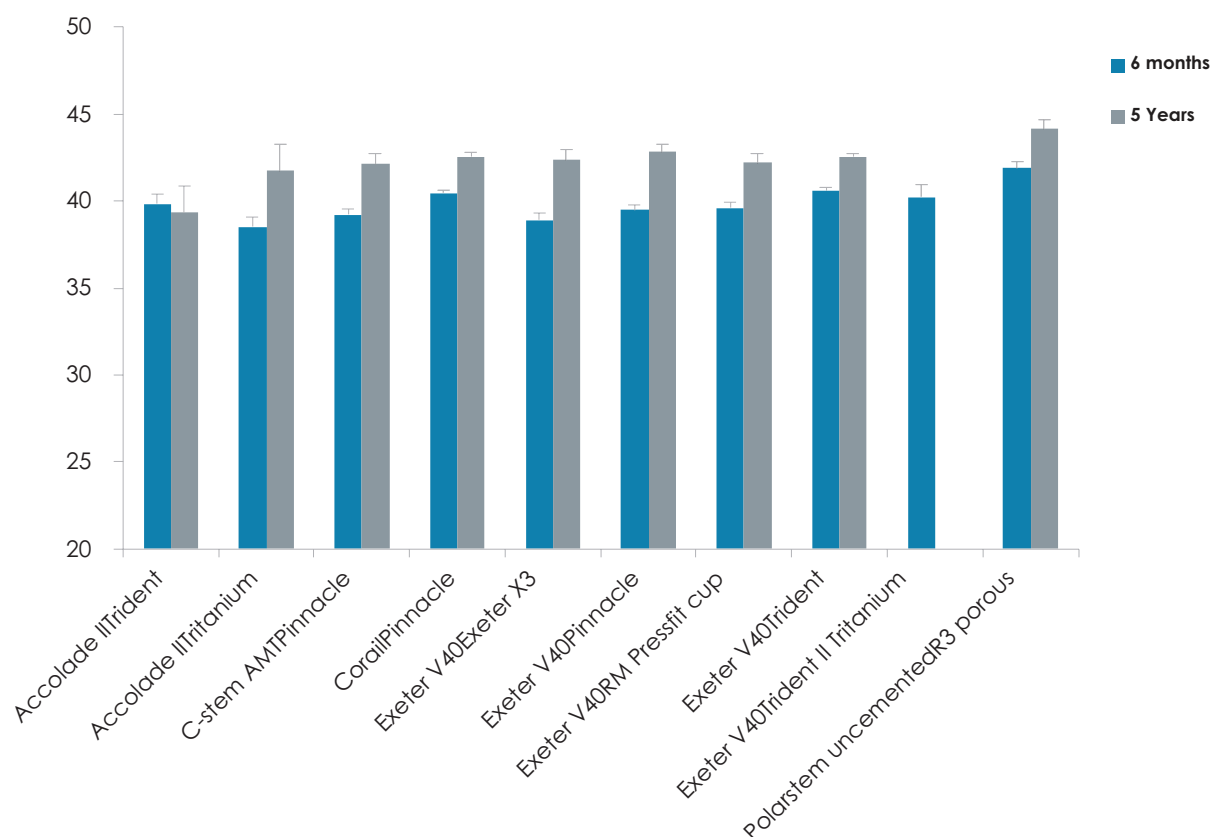
Plotting the patients' six-month scores, following their first revision in the Kalairajah groupings, against the proportion of hips revised for that same group, again demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has almost 8 times the risk of a revision within two years compared to a person with a score >42.

Kalairajah grouping of Oxford Score at 2 years	Re-Revision to 2 years	No. revised	%	Std error
< 27	1,651	281	17.02	0.92
27-33	1,577	118	7.48	0.66
34-41	2,883	137	4.75	0.40
42+	3,064	66	2.15	0.26

Revision (%) to 2 years by Oxford score at Revision



Mean Oxford scores at 6 months and 5 years for 10 hip combinations with > 2000 registrations.



Revision versus hip prostheses combinations sorted on revision rate

(Minimum of 50 primary registered arthroplasties- all fixation types)

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
S-Rom	ASR	130	897.9	96	10.69	8.61	12.99	0
Corail	ASR	156	1377.2	84	6.10	4.83	7.51	0
Anthology Porous	BHR Acetabular Cup	93	844.0	51	6.04	4.45	7.88	0
Anthology Porous	R3 porous	68	576.1	34	5.90	4.09	8.25	0
Summit	ASR	88	873.0	38	4.35	3.08	5.97	0
Synergy Porous	BHR Acetabular Cup	114	1222.6	42	3.44	2.48	4.64	0
CLS	Artek	59	786.2	26	3.31	2.11	4.77	0
CLS	Durom	198	2298.8	68	2.96	2.30	3.75	0
CCA SS	Duraloc	69	935.0	27	2.89	1.86	4.14	0
Actis Duofix	Pinnacle	58	36.2	1	2.76	0.07	15.37	47
Charnley	Duraloc	55	782.1	20	2.56	1.51	3.87	0
ABG	Duraloc	140	2431.5	54	2.22	1.67	2.90	0
CPT	G7 acetabular	119	339.1	7	2.06	0.83	4.25	10
ABGII	Duraloc	141	2189.3	45	2.06	1.48	2.72	0
Quadra-H	Acetabular Shell	345	438.9	9	2.05	0.94	3.89	138
Lateral straight stem	Trilogy	69	658.6	13	1.97	1.00	3.28	0
CPCS	Reflection porous	82	1046.7	19	1.82	1.09	2.83	0
Corail	Trident II Titanium	51	55.2	1	1.81	0.05	10.10	22
TwinSys cemented	Pinnacle	143	569.6	10	1.76	0.84	3.23	21
Accolade II	Continuum TM	234	399.5	7	1.75	0.70	3.61	75
Prodigy	Duraloc	143	2070.7	36	1.74	1.20	2.38	0
ABGII	RM Pressfit cup	91	463.5	8	1.73	0.75	3.40	0
Elite plus	Duraloc	984	13257.8	219	1.65	1.44	1.89	0
Accolade II	Trident II Titanium	153	186.0	3	1.61	0.33	4.71	71
Metafix	Trinity	119	197.8	3	1.52	0.21	4.05	33
ABG	ABGII	79	1323.4	20	1.51	0.92	2.33	0
TPP Thrust Plate	Fitmore	68	1092.2	16	1.46	0.84	2.38	0
Spectron	Duraloc	1570	20927.1	296	1.41	1.26	1.59	0
MS 30	G7 acetabular	181	215.2	3	1.39	0.29	4.07	89
CBC	Expansys shell	183	2108.4	29	1.38	0.92	1.98	0
CLS	RM cup	114	1403.5	19	1.35	0.82	2.11	0
H-Max M	Delta-PF Cup	141	1355.5	18	1.33	0.79	2.10	0
H-Max C	Delta-TT Cup	123	377.2	5	1.33	0.36	2.91	13
M/L Taper	Delta-TT Cup	64	483.8	6	1.24	0.46	2.70	0
Mallory-Head	M2A	105	1460.4	18	1.23	0.73	1.95	0
Exeter	Duraloc	916	14350.7	176	1.23	1.05	1.42	0
SL modular stem	Duraloc	54	816.8	10	1.22	0.59	2.25	0
Accolade II	RM Pressfit cup	239	491.2	6	1.22	0.45	2.66	103

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
Exeter	Vitalock	71	822.6	10	1.22	0.58	2.24	0
Spectron	Reflection cemented	2,984	31820.7	380	1.19	1.08	1.32	1
Contemporary	Contemporary	81	1090.9	13	1.19	0.63	2.04	0
CCA SS	Contemporary	78	848.7	10	1.18	0.52	2.09	0
Spectron	Muller PE cup	67	695.0	8	1.15	0.50	2.27	0
AML MMA	Duraloc	80	1233.2	14	1.14	0.62	1.90	0
Spectron	Morscher	211	3057.1	34	1.11	0.77	1.55	0
TwinSys uncemented	Selexys TPS	1,231	13385.9	147	1.10	0.93	1.29	0
CLS	Duraloc	740	10984.2	120	1.09	0.91	1.31	0
AML	Duraloc	54	872.3	9	1.03	0.47	1.96	0
Exeter	Contemporary	1,625	20085.7	204	1.02	0.88	1.16	0
TwinSys cemented	Selexys TPS	65	592.4	6	1.01	0.37	2.20	0
Taperloc Complete	Continuum TM	277	698.4	7	1.00	0.40	2.06	34
CLS	Allofit	192	2336.3	23	0.98	0.62	1.48	0
Exeter V40	Duraloc	1,212	15541.7	153	0.98	0.83	1.15	0
S-Rom	Ultima	78	1433.8	14	0.98	0.53	1.64	0
Exeter V40	Trabecular Metal Shell	257	1536.3	15	0.98	0.55	1.61	15
Avenir Muller uncemented	Continuum TM	182	1485.5	14	0.94	0.52	1.58	0
DSP Thrust Plate	Fitmore	123	2451.3	23	0.94	0.59	1.41	0
Corail	Duraloc	468	6064.9	56	0.92	0.69	1.19	0
Spectron	Reflection porous	3,350	40631.9	373	0.92	0.83	1.01	0
MS 30	Contemporary	128	1321.8	12	0.91	0.47	1.59	0
ABGII	Trident	353	5002.4	45	0.90	0.66	1.20	0
Quadra-C	Acetabular Shell	240	337.7	3	0.89	0.18	2.60	90
DSP Thrust Plate	CLS Expansion	60	1031.9	9	0.87	0.40	1.66	0
Friendly	Delta-TT Cup	68	573.8	5	0.87	0.28	2.03	0
S-Rom	Pinnacle	401	4617.7	40	0.87	0.61	1.17	12
C-Stem	Pinnacle	85	470.3	4	0.85	0.23	2.18	0
C-Stem	Duraloc	72	947.2	8	0.84	0.36	1.66	0
CPT	Tritanium	85	830.1	7	0.84	0.30	1.66	0
SL modular stem	RM cup	322	5010.1	42	0.84	0.60	1.13	0
Corail	Fitmore	352	1794.3	15	0.84	0.47	1.38	19
Taperloc Complete	Trident	119	119.7	1	0.84	0.02	4.66	62
TwinSys uncemented	RM cup	122	1318.1	11	0.83	0.39	1.44	0
MasterSL	Delta-TT Cup	133	361.3	3	0.83	0.17	2.43	13
CPT	Duraloc	413	5201.9	43	0.83	0.60	1.11	0
CPT	Fitmore	195	1501.8	12	0.80	0.41	1.40	0



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
ABGII	Delta-PF Cup	107	1524.2	12	0.79	0.41	1.38	0
CLS	CLS Expansion	1269	18109.5	142	0.78	0.66	0.92	0
Accolade II	Fitmore	110	258.3	2	0.77	0.09	2.80	23
CPT	Trilogy	856	8061.8	62	0.77	0.58	0.98	0
Lateral straight stem	RM cup	534	6091.5	46	0.76	0.55	1.01	0
Furlong	Furlong	66	934.8	7	0.75	0.30	1.54	0
Corail	RM Pressfit cup	167	935.5	7	0.75	0.30	1.54	4
Accolade	Muller PE cup	114	1337.0	10	0.75	0.33	1.33	0
MS 30	Duraloc	161	2675.5	20	0.75	0.46	1.15	0
CPT	Trident	158	2143.7	16	0.75	0.43	1.21	0
Standard straight stem	RM cup	138	1742.6	13	0.75	0.40	1.28	0
Charnley	Charnley Cup Ogee	303	4160.4	31	0.75	0.50	1.04	0
Exeter	Exeter	1,376	16795.4	124	0.74	0.61	0.88	0
TwinSys cemented	CCB	460	2996.5	22	0.73	0.46	1.11	6
S-Rom	Duraloc	56	966.2	7	0.72	0.29	1.49	0
CPT	Monoblock Acetabular Cup	84	1105.6	8	0.72	0.28	1.37	0
H-Max S	Delta-PF Cup	279	1265.0	9	0.71	0.33	1.35	27
Echo Bi-Metric	Continuum TM	176	565.9	4	0.71	0.19	1.81	29
Versys cemented	ZCA	391	4548.4	32	0.70	0.48	0.99	0
H-Max S	Delta-TT Cup	963	5272.2	37	0.70	0.49	0.96	62
Accolade II	Tritanium	1,555	5874.8	41	0.70	0.50	0.95	239
Wagner cone stem	Continuum TM	60	291.7	2	0.69	0.08	2.48	5
Corail	Monoblock Acetabular Cup	95	1173.8	8	0.68	0.29	1.34	0
CPT	ZCA	572	6238.7	42	0.67	0.48	0.90	3
Stemsys	Agilis Ti-por	545	2977.5	20	0.67	0.41	1.04	0
CLS	Trident	208	2836.7	19	0.67	0.40	1.05	0
CLS	Fitek	66	1347.1	9	0.67	0.31	1.27	0
Exeter V40	Bio-clad poly	140	1200.2	8	0.67	0.29	1.31	0
CBC	RM Pressfit cup	445	3772.2	25	0.66	0.42	0.96	0
CBC	Fitmore	59	756.0	5	0.66	0.21	1.54	0
Elite plus	Charnley	302	3956.1	26	0.66	0.42	0.95	0
C-Stem AMT	Pinnacle	3,389	15257.2	99	0.65	0.53	0.79	345
C-Stem AMT	RM Pressfit cup	132	783.9	5	0.64	0.21	1.49	1
CPT	Continuum TM	1,791	9328.0	59	0.63	0.48	0.81	62
CPT	Delta-TT Cup	128	475.8	3	0.63	0.13	1.84	11
CLS	RM Pressfit cup	649	5398.9	34	0.63	0.43	0.87	22
Exeter V40	Continuum TM	3,035	17488.1	110	0.63	0.52	0.76	147
Omnifit	Trident	164	2386.4	15	0.63	0.35	1.04	0

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
C-Stem AMT	Marathon cemented	368	2422.9	15	0.62	0.35	1.02	3
MS 30	Morscher	809	11249.9	69	0.61	0.47	0.77	0
Taperloc Complete	G7 acetabular	503	1478.9	9	0.61	0.28	1.16	72
ABGII	Pinnacle	67	823.6	5	0.61	0.20	1.42	0
Summit	Pinnacle	2,744	20185.5	121	0.60	0.50	0.72	169
Exeter V40	Delta-TT Cup	322	1511.8	9	0.60	0.27	1.13	35
TwinSys uncemented	RM Pressfit cup	5,308	40912.9	241	0.59	0.52	0.67	113
Echo Bi-Metric	G7 acetabular	983	2719.6	16	0.59	0.34	0.96	142
M/L Taper	Continuum TM	1,054	7149.0	42	0.59	0.42	0.79	0
CLS	Monoblock Acetabular Cup	80	1032.4	6	0.58	0.21	1.27	0
Stemsys	Polymax	182	689.9	4	0.58	0.16	1.48	15
Exeter V40	R3 porous	820	3978.6	23	0.58	0.37	0.87	89
Optimys	RM Pressfit cup	433	870.9	5	0.57	0.16	1.26	150
CLS	Weill ring	118	2091.3	12	0.57	0.30	1.00	0
Exeter	Muller PE cup	132	1748.7	10	0.57	0.27	1.05	0
CLS	Trilogy	742	6045.1	34	0.56	0.38	0.78	42
Polarstem uncemented	Reflection porous	335	2858.6	16	0.56	0.31	0.89	0
Exeter V40	Exeter	1636	17233.2	96	0.56	0.45	0.68	1
Corail	Pinnacle	15,093	82841.8	461	0.56	0.51	0.61	1,645
CCA SS	CCB	784	6880.1	38	0.55	0.39	0.76	2
MS 30	RM Pressfit cup	90	906.0	5	0.55	0.15	1.21	0
Taperloc Complete	RM Pressfit cup	375	1088.7	6	0.55	0.20	1.20	49
CLS	Trabecular Metal Shell	59	545.0	3	0.55	0.08	1.47	2
Corail	Continuum TM	336	2004.0	11	0.55	0.27	0.98	2
Lateral straight stem	Muller PE cup stem	770	7834.6	43	0.55	0.39	0.73	2
Exeter V40	G7 acetabular	367	917.1	5	0.55	0.18	1.27	57
Exeter	Bio-clad poly	113	1289.0	7	0.54	0.19	1.07	0
Elite plus	Elite Plus LPW	284	3344.8	18	0.54	0.32	0.85	0
Accolade II	Trident	1,580	5605.2	30	0.54	0.36	0.76	239
H-Max M	Delta-TT Cup	168	1700.7	9	0.53	0.24	1.00	0
Exeter	CLS Expansion	187	2468.9	13	0.53	0.28	0.90	0
Elite plus	Elite Plus Ogee	111	1140.7	6	0.53	0.19	1.14	0
CLS	Reflection porous	425	4182.7	22	0.53	0.33	0.80	0
TwinSys cemented	Continuum TM	152	760.6	4	0.53	0.14	1.35	10
Trabecular Metal Stem	Continuum TM	503	3464.8	18	0.52	0.31	0.82	16
TwinSys uncemented	Trilogy	209	2318.2	12	0.52	0.27	0.90	0



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
Avenir Muller uncemented	Fitmore	70	387.7	2	0.52	0.06	1.86	1
Exeter	Osteolock	2,051	29872.2	153	0.51	0.43	0.60	0
Polarstem uncemented	R3 porous	2,223	9870.7	50	0.51	0.38	0.67	209
Exeter V40	PolarCup cemented	70	199.3	1	0.50	0.01	2.80	19
CLS	Titanium	89	601.3	3	0.50	0.10	1.46	2
Synergy Porous	R3 porous	1,853	12848.3	64	0.50	0.38	0.64	12
CCA SS	RM Pressfit cup	135	1414.2	7	0.49	0.20	1.02	0
CLS	Continuum TM	990	5310.4	26	0.49	0.32	0.72	91
Exeter V40	Titanium	4,034	21167.2	103	0.49	0.40	0.59	196
Spectron	Fitmore	120	1657.9	8	0.48	0.21	0.95	0
CLS	Fitmore	2,414	29505.5	139	0.47	0.40	0.56	35
CLS	Morscher	1,701	27006.8	127	0.47	0.39	0.56	0
Avenir Muller uncemented	RM cup	105	1064.1	5	0.47	0.13	1.03	0
Exeter V40	Contemporary	6,667	59496.5	276	0.46	0.41	0.52	35
Spectron	Biomex acet shell porous	194	3239.0	15	0.46	0.25	0.74	0
Tri-Lock BPS	Pinnacle	129	648.0	3	0.46	0.10	1.35	36
Lateral straight stem	Continuum TM	78	652.3	3	0.46	0.09	1.34	0
SL monoblock	Muller PE cup	560	6771.2	31	0.46	0.31	0.65	0
Exeter	Morscher	580	9553.9	43	0.45	0.33	0.61	0
Exeter V40	Morscher	630	8393.7	37	0.44	0.31	0.60	0
H-Max S	Trident	67	227.2	1	0.44	0.01	2.45	8
Spectron	Trident	104	1368.9	6	0.44	0.16	0.95	0
Exeter V40	Pinnacle	3,420	19181.6	82	0.43	0.34	0.53	259
Charnley	Charnley	461	5860.8	25	0.43	0.28	0.63	0
M/L Taper	Trident	333	1647.5	7	0.42	0.15	0.83	0
TwinSys uncemented	Continuum TM	138	1181.7	5	0.42	0.14	0.99	1
M/L Taper	Trilogy	215	2403.6	10	0.42	0.20	0.77	0
Stemsys	Fixa Ti Por	933	5093.9	21	0.41	0.25	0.62	54
PLS	Delta-TT Cup	51	245.5	1	0.41	0.01	2.27	4
TwinSys cemented	RM Pressfit cup	2,346	13601.8	55	0.40	0.30	0.52	149
Exeter V40	Osteolock	681	8954.2	36	0.40	0.28	0.55	0
CPCS	R3 porous	368	1747.8	7	0.40	0.14	0.79	1
Summit	Trilogy	194	1748.2	7	0.40	0.16	0.83	8
Accolade	Trident	1,907	25509.2	102	0.40	0.33	0.49	0
Summit	Duraloc	106	1503.6	6	0.40	0.15	0.87	0
Wagner cone stem	Fitmore	79	1009.7	4	0.40	0.11	1.01	0
Exeter V40	Trident	14,304	100378.3	396	0.39	0.36	0.43	1,223

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
Stemsys	Delta-PF Cup	606	2547.6	10	0.39	0.17	0.70	58
Exeter V40	Reflection cemented	1,005	7456.0	29	0.39	0.26	0.56	17
Corail	Trident	115	776.9	3	0.39	0.08	1.13	8
Exeter V40	CCB	606	4146.4	16	0.39	0.21	0.63	20
Corail	Tritanium	182	1318.3	5	0.38	0.10	0.83	0
Exeter V40	Exeter X3	2,999	13975.0	52	0.37	0.28	0.49	249
Versys	Trilogy	453	7584.9	28	0.37	0.25	0.53	0
Standard straight stem	Muller PE cup	638	6311.1	23	0.36	0.23	0.55	2
Corail	Reflection porous	140	1667.5	6	0.36	0.11	0.74	0
Exeter V40	Reflection porous	545	5942.8	21	0.35	0.22	0.54	0
Lateral straight stem	Weber	287	3113.7	11	0.35	0.17	0.61	0
C-Stem	Elite Plus Ogee	55	568.8	2	0.35	0.04	1.27	0
Spectron	R3 porous	451	3458.6	12	0.35	0.17	0.59	3
TwinSys cemented	RM cup	148	1753.8	6	0.34	0.13	0.74	0
CLS	Pinnacle	124	883.2	3	0.34	0.07	0.99	19
Exeter V40	Polymax	85	296.6	1	0.34	0.01	1.88	1
Avenir Muller uncemented	RM Pressfit cup	53	299.3	1	0.33	0.01	1.86	0
Spectron	Mallory-Head	255	3592.5	12	0.33	0.17	0.58	0
Polarstem uncemented	RM Pressfit cup	183	301.1	1	0.33	0.01	1.85	42
Stemsys	RM Pressfit cup	390	2112.3	7	0.33	0.13	0.68	15
Modulus Hip	Delta-PF Cup	66	909.4	3	0.33	0.07	0.96	0
Exeter V40	Trilogy	3,529	30894.1	100	0.32	0.26	0.39	149
Synergy Porous	Reflection porous	1,363	16683.8	54	0.32	0.24	0.42	0
MS 30	Muller PE cup	521	5351.1	17	0.32	0.19	0.51	0
CPT	Pinnacle	66	631.6	2	0.32	0.04	1.14	0
MS 30	Fitmore	3,019	25460.8	80	0.31	0.25	0.39	167
Exeter V40	Trident II Tritanium	1,108	1281.3	4	0.31	0.07	0.74	548
Corail	Ultima	135	1290.8	4	0.31	0.08	0.79	0
Accolade II	Delta-TT Cup	73	324.5	1	0.31	0.01	1.72	0
Exeter V40	RM Pressfit cup	3,153	18003.0	55	0.31	0.23	0.40	216
Corail	G7 acetabular	108	331.0	1	0.30	0.01	1.68	37
Exeter V40	Muller PE cup	94	1001.5	3	0.30	0.06	0.88	0
Exeter V40	CLS Expansion	105	1346.6	4	0.30	0.08	0.76	0
Trabecular Metal Stem	Monoblock Acetabular Cup	74	1025.6	3	0.29	0.06	0.85	0
Standard straight stem	Weber	134	1392.7	4	0.29	0.08	0.74	0
MS 30	Continuum TM	477	2799.5	8	0.29	0.12	0.56	11



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
Avenir Muller uncemented	Pinnacle	99	1071.1	3	0.28	0.04	0.75	0
Friendly	Delta-PF Cup	178	2166.0	6	0.28	0.10	0.60	5
Exeter V40	Monoblock Acetabular Cup	123	1822.2	5	0.27	0.09	0.64	0
Corail	Delta-PF Cup	83	1094.4	3	0.27	0.04	0.73	0
Corail	Trilogy	235	1515.4	4	0.26	0.07	0.68	17
Versys cemented	Trilogy	558	6834.9	18	0.26	0.16	0.42	0
Standard straight stem	ZCA all-poly cup	50	396.9	1	0.25	0.00	1.40	0
Exeter	Trilogy	381	5765.0	14	0.24	0.13	0.41	0
Avenir Muller uncemented	Tritanium	91	864.3	2	0.23	0.03	0.84	0
MS 30	Trilogy	419	3081.4	7	0.23	0.08	0.45	20
Echo Bi-Metric	Exceed ABT Ringloc-X	57	473.3	1	0.21	0.01	1.18	0
Accolade	Tritanium	152	1463.3	3	0.21	0.04	0.60	0
Stemsys	DeltaMotion Cup	541	3950.5	8	0.20	0.09	0.40	0
SL modular stem	Muller PE cup	110	1520.7	3	0.20	0.04	0.58	0
Lateral straight stem	RM Pressfit cup	173	1567.0	3	0.19	0.04	0.56	0
Basis	Reflection porous	108	1045.1	2	0.19	0.02	0.69	0
Synergy Porous	Delta-PF Cup	118	1061.5	2	0.19	0.02	0.68	22
Exeter V40	Weber	53	624.1	1	0.16	0.00	0.89	0
CPT	ZCA all-poly cup	99	661.3	1	0.15	0.00	0.84	1
Accolade	Pinnacle	180	2018.7	3	0.15	0.03	0.43	0
MS 30	ZCA all-poly cup	96	701.9	1	0.14	0.00	0.79	2
Exeter V40	ZCA	103	716.7	1	0.14	0.00	0.78	1
Exeter V40	Fitmore	1,177	7905.8	11	0.14	0.07	0.24	43
Corail	DeltaMotion Cup	78	747.7	1	0.13	0.00	0.75	0
Lateral straight stem	ZCA	98	895.3	1	0.11	0.00	0.62	0
Exeter	Trident	163	2722.0	3	0.11	0.02	0.32	0
TwinSys uncemented	Delta-PF Cup	395	4061.4	4	0.10	0.03	0.25	13
Standard straight stem	RM Pressfit cup	137	1293.8	1	0.08	0.00	0.43	0
C-Stem	Marathon cemented	94	537.3	0	0.00	0.00	0.69	0
Echo Bi-Metric	G7 acetabular shell	150	47.3	0	0.00	0.00	7.80	150
Exeter V40	G7 acetabular shell	106	27.7	0	0.00	0.00	13.32	104
Exeter V40	ZCA all-poly cup	110	596.7	0	0.00	0.00	0.62	0
Lateral straight stem	ZCA all-poly cup	70	574.9	0	0.00	0.00	0.64	0
MS 30	G7 acetabular shell	84	29.4	0	0.00	0.00	12.55	84

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2021
MS 30	Pinnacle	167	359.5	0	0.00	0.00	1.03	62
Stemsys	Maxera Cup	86	98.0	0	0.00	0.00	3.76	40
Stemsys cemented	Delta-PF Cup	91	357.6	0	0.00	0.00	1.03	12
Stemsys cemented	RM Pressfit cup	82	338.2	0	0.00	0.00	1.09	0
Synergy Porous	Continuum TM	55	285.5	0	0.00	0.00	1.29	0
Taperloc Complete	Delta-TT Cup	144	323.1	0	0.00	0.00	1.14	35
Taperloc Complete	G7 acetabular shell	83	25.8	0	0.00	0.00	14.28	83
TwinSys cemented	Reflection porous	73	388.2	0	0.00	0.00	0.95	0

Revision rate versus hip prostheses combination and fixation method, Sorted by number of implantations

(Minimum of 50 primary registered arthroplasties)

Cemented THA

Cemented	Match	No. Ops.	Observed Comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter V40	Contemporary	6,665	59496.2	276	0.46	0.41	0.52
Exeter V40	Exeter X3	2,992	13973.0	52	0.37	0.28	0.49
Spectron	Reflection cemented	2,984	31820.7	380	1.19	1.08	1.32
Exeter V40	Exeter	1,636	17233.2	96	0.56	0.45	0.68
Exeter	Contemporary	1,625	20085.7	204	1.02	0.88	1.16
Exeter	Exeter	1,376	16795.4	124	0.74	0.61	0.88
Exeter V40	Reflection cemented	1,005	7456.0	29	0.39	0.26	0.56
CCA SS	CCB	784	6880.1	38	0.55	0.39	0.76
Lateral straight stem	Muller PE cup	770	7834.6	43	0.55	0.39	0.73
Standard straight stem	Muller PE cup	637	6310.6	23	0.36	0.23	0.55
Exeter V40	CCB	606	4146.4	16	0.39	0.21	0.63
CPT	ZCA	572	6238.7	42	0.67	0.48	0.90
SL monoblock	Muller PE cup	560	6771.2	31	0.46	0.31	0.65
MS 30	Muller PE cup	521	5351.1	17	0.32	0.19	0.51
Charnley	Charnley	461	5860.8	25	0.43	0.28	0.63
TwinSys cemented	CCB	460	2996.5	22	0.73	0.46	1.11
Versys cemented	ZCA	391	4548.4	32	0.70	0.48	0.99
C-Stem AMT	Marathon cemented	368	2422.9	15	0.62	0.35	1.02
Charnley	Charnley Cup Ogee	303	4160.4	31	0.75	0.50	1.04
Elite plus	Charnley	302	3956.1	26	0.66	0.42	0.95
Lateral straight stem	Weber	287	3113.7	11	0.35	0.17	0.61
Elite plus	Elite Plus LPW	284	3344.8	18	0.54	0.32	0.85
Exeter V40	Bio-clad poly	140	1200.2	8	0.67	0.29	1.31
Standard straight stem	Weber	134	1392.7	4	0.29	0.08	0.74



Cemented	Match	No. Ops.	Observed Comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter	Muller PE cup	132	1748.7	10	0.57	0.27	1.05
MS 30	Contemporary	128	1321.8	12	0.91	0.47	1.59
Exeter	Bio-clad poly	113	1289.0	7	0.54	0.19	1.07
Elite plus	Elite Plus Ogee	111	1140.7	6	0.53	0.19	1.14
Exeter V40	ZCA all-poly cup	110	596.7	0	0.00	0.00	0.62
SL modular stem	Muller PE cup	110	1520.7	3	0.20	0.04	0.58
Exeter V40	ZCA	102	715.9	1	0.14	0.00	0.78
CPT	ZCA all-poly cup	99	661.3	1	0.15	0.00	0.84
Lateral straight stem	ZCA	98	895.3	1	0.11	0.00	0.62
MS 30	ZCA all-poly cup	96	701.9	1	0.14	0.00	0.79
C-Stem	Marathon cemented	94	537.3	0	0.00	0.00	0.69
Exeter V40	Muller PE cup	94	1001.5	3	0.30	0.06	0.88
Contemporary	Contemporary	81	1090.9	13	1.19	0.63	2.04
CCA SS	Contemporary	78	848.7	10	1.18	0.52	2.09
Lateral straight stem	ZCA all-poly cup	70	574.9	0	0.00	0.00	0.64
Exeter V40	PolarCup cemented	67	197.5	1	0.51	0.01	2.82
Spectron	Muller PE cup	67	695.0	8	1.15	0.50	2.27
C-Stem	Elite Plus Ogee	55	568.8	2	0.35	0.04	1.27
Exeter V40	Weber	53	624.1	1	0.16	0.00	0.89
Standard straight stem	ZCA all-poly cup	50	396.9	1	0.25	0.00	1.40

Uncemented THA

Uncemented	Match	No. Ops.	Observed Comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Corail	Pinnacle	15,090	82841.2	461	0.56	0.51	0.61
TwinSys uncemented	RM Pressfit cup	5,308	40912.9	241	0.59	0.52	0.67
Summit	Pinnacle	2,744	20185.5	121	0.60	0.50	0.72
CLS	Fitmore	2,414	29505.5	139	0.47	0.40	0.56
Polarstem uncemented	R3 porous	2,223	9870.7	50	0.51	0.38	0.67
Accolade	Trident	1,907	25509.2	102	0.40	0.33	0.49
Synergy Porous	R3 porous	1,853	12848.3	64	0.50	0.38	0.64
CLS	Morscher	1,701	27006.8	127	0.47	0.39	0.56
Accolade II	Trident	1,571	5593.6	30	0.54	0.36	0.77
Accolade II	Tritanium	1,554	5874.1	41	0.70	0.50	0.95
Synergy Porous	Reflection porous	1,363	16683.8	54	0.32	0.24	0.42
CLS	CLS Expansion	1,269	18109.5	142	0.78	0.66	0.92
TwinSys uncemented	Selexys TPS	1,231	13385.9	147	1.10	0.93	1.29
M/L Taper	Continuum TM	1,054	7149.0	42	0.59	0.42	0.79
CLS	Continuum TM	990	5310.4	26	0.49	0.32	0.72
Echo Bi-Metric	G7 acetabular	983	2719.6	16	0.59	0.34	0.96

Uncemented	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
H-Max S	Delta-TT Cup	963	5272.2	37	0.70	0.49	0.96
Stemsys	Fixa Ti Por	933	5093.9	21	0.41	0.25	0.62
CLS	Trilogy	742	6045.1	34	0.56	0.38	0.78
CLS	Duraloc	740	10984.2	120	1.09	0.91	1.31
CLS	RM Pressfit cup	649	5398.9	34	0.63	0.43	0.87
Stemsys	Delta-PF Cup	605	2546.5	10	0.39	0.17	0.70
Stemsys	Agilis Ti-por	545	2977.5	20	0.67	0.41	1.04
Stemsys	DeltaMotion Cup	541	3950.5	8	0.20	0.09	0.40
Taperloc Complete	G7 acetabular	503	1478.9	9	0.61	0.28	1.16
Trabecular Metal Stem	Continuum TM	503	3464.8	18	0.52	0.31	0.82
Corail	Duraloc	468	6064.9	56	0.92	0.69	1.19
Versys	Trilogy	453	7584.9	28	0.37	0.25	0.53
CBC	RM Pressfit cup	445	3772.2	25	0.66	0.42	0.96
Optimys	RM Pressfit cup	432	870.9	5	0.57	0.16	1.26
CLS	Reflection porous	425	4182.7	22	0.53	0.33	0.80
S-Rom	Pinnacle	401	4617.7	40	0.87	0.61	1.17
TwinSys uncemented	Delta-PF Cup	395	4061.4	4	0.10	0.03	0.25
Stemsys	RM Pressfit cup	390	2112.3	7	0.33	0.13	0.68
Taperloc Complete	RM Pressfit cup	375	1088.7	6	0.55	0.20	1.20
ABGII	Trident	353	5002.4	45	0.90	0.66	1.20
Corail	Fitmore	352	1794.3	15	0.84	0.47	1.38
Quadra-H	Acetabular Shell	345	438.9	9	2.05	0.94	3.89
Corail	Continuum TM	336	2004.0	11	0.55	0.27	0.98
Polarstem uncemented	Reflection porous	335	2858.6	16	0.56	0.31	0.89
M/L Taper	Trident	333	1647.5	7	0.42	0.15	0.83
H-Max S	Delta-PF Cup	279	1265.0	9	0.71	0.33	1.35
Taperloc Complete	Continuum TM	277	698.4	7	1.00	0.40	2.06
Accolade II	RM Pressfit cup	239	491.2	6	1.22	0.45	2.66
Corail	Trilogy	235	1515.4	4	0.26	0.07	0.68
Accolade II	Continuum TM	232	396.4	7	1.77	0.71	3.64
M/L Taper	Trilogy	215	2403.6	10	0.42	0.20	0.77
TwinSys uncemented	Trilogy	209	2318.2	12	0.52	0.27	0.90
CLS	Trident	208	2836.7	19	0.67	0.40	1.05
CLS	Durom	198	2298.8	68	2.96	2.30	3.75
Summit	Trilogy	194	1748.2	7	0.40	0.16	0.83
CLS	Allofit	192	2336.3	23	0.98	0.62	1.48
CBC	Expansys shell	183	2108.4	29	1.38	0.92	1.98
Polarstem uncemented	RM Pressfit cup	183	301.1	1	0.33	0.01	1.85
Avenir Muller uncemented	Continuum TM	182	1485.5	14	0.94	0.52	1.58
Corail	Tritanium	182	1318.3	5	0.38	0.10	0.83



Uncemented	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Stemsys	Polymax	182	689.9	4	0.58	0.16	1.48
Accolade	Pinnacle	180	2018.7	3	0.15	0.03	0.43
Echo Bi-Metric	Continuum TM	176	565.9	4	0.71	0.19	1.81
H-Max M	Delta-TT Cup	168	1700.7	9	0.53	0.24	1.00
Corail	RM Pressfit cup	167	935.5	7	0.75	0.30	1.54
Corail	ASR	156	1377.2	84	6.10	4.83	7.51
Accolade	Tritanium	152	1463.3	3	0.21	0.04	0.60
Accolade II	Trident II Tritanium	152	184.8	3	1.62	0.33	4.74
Echo Bi-Metric	G7 acetabular shell	149	47.2	0	0.00	0.00	7.82
Taperloc Complete	Delta-TT Cup	144	323.1	0	0.00	0.00	1.14
Prodigy	Duraloc	143	2070.7	36	1.74	1.20	2.38
ABGII	Duraloc	141	2189.3	45	2.06	1.48	2.72
H-Max M	Delta-PF Cup	141	1355.5	18	1.33	0.79	2.10
ABG	Duraloc	140	2431.5	54	2.22	1.67	2.90
Corail	Reflection porous	140	1667.5	6	0.36	0.11	0.74
TwinSys uncemented	Continuum TM	138	1181.7	5	0.42	0.14	0.99
Omnifit	Trident	137	2040.9	14	0.69	0.38	1.15
MasterSL	Delta-TT Cup	133	361.3	3	0.83	0.17	2.43
S-Rom	ASR	130	897.9	96	10.69	8.61	12.99
Tri-Lock BPS	Pinnacle	129	648.0	3	0.46	0.10	1.35
CLS	Pinnacle	124	883.2	3	0.34	0.07	0.99
DSP Thrust Plate	Fitmore	123	2451.3	23	0.94	0.59	1.41
TwinSys uncemented	RM cup	122	1318.1	11	0.83	0.39	1.44
Metafix	Trinity	119	197.8	3	1.52	0.21	4.05
Taperloc Complete	Trident	119	119.7	1	0.84	0.02	4.66
CLS	Weill ring	118	2091.3	12	0.57	0.30	1.00
Synergy Porous	Delta-PF Cup	118	1061.5	2	0.19	0.02	0.68
Corail	Trident	115	776.9	3	0.39	0.08	1.13
CLS	RM cup	114	1403.5	19	1.35	0.82	2.11
Synergy Porous	BHR Acetabular Cup	114	1222.6	42	3.44	2.48	4.64
Accolade II	Fitmore	110	258.3	2	0.77	0.09	2.80
Corail	G7 acetabular	108	331.0	1	0.30	0.01	1.68
ABGII	Delta-PF Cup	107	1524.2	12	0.79	0.41	1.38
Summit	Duraloc	106	1503.6	6	0.40	0.15	0.87
Avenir Muller uncemented	RM cup	105	1064.1	5	0.47	0.13	1.03
Mallory-Head	M2A	105	1460.4	18	1.23	0.73	1.95
Avenir Muller uncemented	Pinnacle	99	1071.1	3	0.28	0.04	0.75
Corail	Monoblock Acetabular Cup	95	1173.8	8	0.68	0.29	1.34
ABGII	RM Pressfit cup	91	463.5	8	1.73	0.75	3.40
Anthology Porous	BHR Acetabular Cup	91	828.6	50	6.03	4.43	7.89

Uncemented	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Avenir Muller uncemented	Tritanium	91	864.3	2	0.23	0.03	0.84
CLS	Tritanium	89	601.3	3	0.50	0.10	1.46
Summit	ASR	88	873.0	38	4.35	3.08	5.97
Stemsys	Maxera Cup	86	98.0	0	0.00	0.00	3.76
Corail	Delta-PF Cup	83	1094.4	3	0.27	0.04	0.73
Taperloc Complete	G7 acetabular shell	82	25.4	0	0.00	0.00	14.54
AML MMA	Duraloc	80	1233.2	14	1.14	0.62	1.90
CLS	Monoblock Acetabular Cup	80	1032.4	6	0.58	0.21	1.27
ABG	ABGII	79	1323.4	20	1.51	0.92	2.33
Wagner cone stem	Fitmore	79	1009.7	4	0.40	0.11	1.01
Corail	DeltaMotion Cup	78	747.7	1	0.13	0.00	0.75
S-Rom	Ultima	78	1433.8	14	0.98	0.53	1.64
Trabecular Metal Stem	Monoblock Acetabular Cup	74	1025.6	3	0.29	0.06	0.85
Accolade II	Delta-TT Cup	73	324.5	1	0.31	0.01	1.72
Avenir Muller uncemented	Fitmore	70	387.7	2	0.52	0.06	1.86
Anthology Porous	R3 porous	68	576.1	34	5.90	4.09	8.25
TPP Thrust Plate	Fitmore	68	1092.2	16	1.46	0.84	2.38
ABGII	Pinnacle	67	823.6	5	0.61	0.20	1.42
H-Max S	Trident	67	227.2	1	0.44	0.01	2.45
CLS	Fitek	66	1347.1	9	0.67	0.31	1.27
Furlong	Furlong	66	934.8	7	0.75	0.30	1.54
Modulus Hip	Delta-PF Cup	66	909.4	3	0.33	0.07	0.96
M/L Taper	Delta-TT Cup	64	483.8	6	1.24	0.46	2.70
DSP Thrust Plate	CLS Expansion	60	1031.9	9	0.87	0.40	1.66
Wagner cone stem	Continuum TM	60	291.7	2	0.69	0.08	2.48
CBC	Fitmore	59	756.0	5	0.66	0.21	1.54
CLS	Artek	59	786.2	26	3.31	2.11	4.77
CLS	Trabecular Metal Shell	59	545.0	3	0.55	0.08	1.47
Actis Duofix	Pinnacle	58	36.2	1	2.76	0.07	15.37
Echo Bi-Metric	Exceed ABT Ringloc-X	57	473.3	1	0.21	0.01	1.18
S-Rom	Duraloc	56	966.2	7	0.72	0.29	1.49
Synergy Porous	Continuum TM	55	285.5	0	0.00	0.00	1.29
AML	Duraloc	54	872.3	9	1.03	0.47	1.96
Avenir Muller uncemented	RM Pressfit cup	53	299.3	1	0.33	0.01	1.86
Corail	Trident II Tritanium	51	55.2	1	1.81	0.05	10.10
PLS	Delta-TT Cup	51	245.5	1	0.41	0.01	2.27

Hybird THA

Hybrid	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter V40	Trident	1,4275	100364.1	396	0.39	0.36	0.43
Exeter V40	Tritanium	4,032	21166.5	103	0.49	0.40	0.59
Exeter V40	Trilogy	3,521	30889.4	100	0.32	0.26	0.39
Exeter V40	Pinnacle	3,413	19179.9	82	0.43	0.34	0.53
C-Stem AMT	Pinnacle	3,366	15244.7	99	0.65	0.53	0.79
Spectron	Reflection porous	3,350	40631.9	373	0.92	0.83	1.01
Exeter V40	RM Pressfit cup	3,151	18001.5	55	0.31	0.23	0.40
Exeter V40	Continuum TM	3,033	17486.8	110	0.63	0.51	0.76
MS 30	Fitmore	3,005	25449.5	80	0.31	0.25	0.39
TwinSys cemented	RM Pressfit cup	2,343	13600.9	55	0.40	0.30	0.52
Exeter	Osteolock	2,051	29872.2	153	0.51	0.43	0.60
CPT	Continuum TM	1,789	9326.7	59	0.63	0.48	0.81
Spectron	Duraloc	1,570	20927.1	296	1.41	1.26	1.59
Exeter V40	Duraloc	1,212	15541.7	153	0.98	0.83	1.15
Exeter V40	Fitmore	1,163	7888.5	11	0.14	0.07	0.24
Exeter V40	Trident II Tritanium	1,099	1277.7	4	0.31	0.07	0.74
Elite plus	Duraloc	984	13257.8	219	1.65	1.44	1.89
Exeter	Duraloc	916	14350.7	176	1.23	1.05	1.42
CPT	Trilogy	856	8061.8	62	0.77	0.58	0.98
Exeter V40	R3 porous	818	3977.6	23	0.58	0.37	0.87
MS 30	Morscher	809	11249.9	69	0.61	0.47	0.77
Exeter V40	Osteolock	681	8954.2	36	0.40	0.28	0.55
Exeter V40	Morscher	630	8393.7	37	0.44	0.31	0.60
Exeter	Morscher	580	9553.9	43	0.45	0.33	0.61
Versys cemented	Trilogy	558	6834.9	18	0.26	0.16	0.42
Exeter V40	Reflection porous	545	5942.8	21	0.35	0.22	0.54
Lateral straight stem	RM cup	534	6091.5	46	0.76	0.55	1.01
MS 30	Continuum TM	476	2799.5	8	0.29	0.12	0.56
Spectron	R3 porous	451	3458.6	12	0.35	0.17	0.59
MS 30	Trilogy	418	3081.4	7	0.23	0.08	0.45
CPT	Duraloc	413	5201.9	43	0.83	0.60	1.11
Exeter	Trilogy	381	5765.0	14	0.24	0.13	0.41
CPCS	R3 porous	368	1747.8	7	0.40	0.14	0.79
Exeter V40	G7 acetabular	360	912.3	5	0.55	0.18	1.28
Exeter V40	Delta-TT Cup	322	1511.8	9	0.60	0.27	1.13
SL modular stem	RM cup	322	5010.1	42	0.84	0.60	1.13
Exeter V40	Trabecular Metal Shell	256	1536.2	15	0.98	0.55	1.61
Spectron	Mallory-Head	255	3592.5	12	0.33	0.17	0.58

Hybrid	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Quadra-C	Acetabular Shell	235	332.3	3	0.90	0.19	2.64
Spectron	Morscher	211	3057.1	34	1.11	0.77	1.55
CPT	Fitmore	195	1501.8	12	0.80	0.41	1.40
Spectron	Biomex acet shell porous	194	3239.0	15	0.46	0.25	0.74
Exeter	CLS Expansion	187	2468.9	13	0.53	0.28	0.90
MS 30	G7 acetabular	179	213.6	3	1.40	0.29	4.10
Friendly	Delta-PF Cup	178	2166.0	6	0.28	0.10	0.60
Lateral straight stem	RM Pressfit cup	173	1567.0	3	0.19	0.04	0.56
MS 30	Pinnacle	167	359.5	0	0.00	0.00	1.03
Exeter	Trident	163	2722.0	3	0.11	0.02	0.32
MS 30	Duraloc	161	2675.5	20	0.75	0.46	1.15
CPT	Trident	158	2143.7	16	0.75	0.43	1.21
TwinSys cemented	Continuum TM	152	760.6	4	0.53	0.14	1.35
TwinSys cemented	RM cup	148	1753.8	6	0.34	0.13	0.74
TwinSys cemented	Pinnacle	143	569.6	10	1.76	0.84	3.23
Standard straight stem	RM cup	138	1742.6	13	0.75	0.40	1.28
Standard straight stem	RM Pressfit cup	137	1293.8	1	0.08	0.00	0.43
CCA SS	RM Pressfit cup	135	1414.2	7	0.49	0.20	1.02
Corail	Ultima	134	1281.6	4	0.31	0.09	0.80
C-Stem AMT	RM Pressfit cup	132	783.9	5	0.64	0.21	1.49
CPT	Delta-TT Cup	128	475.8	3	0.63	0.13	1.84
Exeter V40	Monoblock Acetabular Cup	123	1822.2	5	0.27	0.09	0.64
H-Max C	Delta-TT Cup	123	377.2	5	1.33	0.36	2.91
Spectron	Fitmore	120	1657.9	8	0.48	0.21	0.95
CPT	G7 acetabular	116	335.9	7	2.08	0.84	4.29
Accolade	Muller PE cup	114	1337.0	10	0.75	0.33	1.33
Basis	Reflection porous	108	1045.1	2	0.19	0.02	0.69
Exeter V40	CLS Expansion	105	1346.6	4	0.30	0.08	0.76
Spectron	Trident	104	1368.9	6	0.44	0.16	0.95
Exeter V40	G7 acetabular shell	101	26.8	0	0.00	0.00	13.76
Stemsys cemented	Delta-PF Cup	91	357.6	0	0.00	0.00	1.03
MS 30	RM Pressfit cup	90	906.0	5	0.55	0.15	1.21
C-Stem	Pinnacle	85	470.3	4	0.85	0.23	2.18
CPT	Tritanium	85	830.1	7	0.84	0.30	1.66
CPT	Monoblock Acetabular Cup	84	1105.6	8	0.72	0.28	1.37
Exeter V40	Polymax	84	296.5	0	0.00	0.00	1.24
CPCS	Reflection porous	82	1046.7	19	1.82	1.09	2.83
Stemsys cemented	RM Pressfit cup	82	338.2	0	0.00	0.00	1.09
MS 30	G7 acetabular shell	80	27.3	0	0.00	0.00	13.50



Hybrid	Match	No. Ops.	Observed Comp Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Lateral straight stem	Continuum TM	78	652.3	3	0.46	0.09	1.34
TwinSys cemented	Reflection porous	73	388.2	0	0.00	0.00	0.95
C-Stem	Duraloc	72	947.2	8	0.84	0.36	1.66
Exeter	Vitalock	71	822.6	10	1.22	0.58	2.24
CCA SS	Duraloc	69	935.0	27	2.89	1.86	4.14
Lateral straight stem	Trilogy	69	658.6	13	1.97	1.00	3.28
Friendly	Delta-TT Cup	68	573.8	5	0.87	0.28	2.03
CPT	Pinnacle	66	631.6	2	0.32	0.04	1.14
TwinSys cemented	Selexys TPS	65	592.4	6	1.01	0.37	2.20
Charnley	Duraloc	55	782.1	20	2.56	1.51	3.87
SL modular stem	Duraloc	54	816.8	10	1.22	0.59	2.25

Prosthesis combinations based on femur in alphabetical order

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
ABG	ABGII	79	1323.4	20	1.51	0.92	2.33
ABG	Duraloc	140	2431.5	54	2.22	1.67	2.90
ABG	Morscher	1	20.2	0	0.00	0.00	18.23
ABGII	ABGII	30	421.9	6	1.42	0.52	3.10
ABGII	Continuum TM	3	17.3	1	5.77	0.15	32.17
ABGII	Delta-PF Cup	107	1524.2	12	0.79	0.41	1.38
ABGII	Delta-TT Cup	1	11.5	0	0.00	0.00	32.00
ABGII	Duraloc	141	2189.3	45	2.06	1.48	2.72
ABGII	Fitmore	1	20.1	0	0.00	0.00	18.32
ABGII	Mallory-Head	2	37.0	0	0.00	0.00	9.97
ABGII	Mitch TRH	14	138.0	5	3.62	0.98	7.94
ABGII	Morscher	42	719.7	3	0.42	0.09	1.22
ABGII	Muller PE cup	1	14.5	0	0.00	0.00	25.52
ABGII	Pinnacle	67	823.6	5	0.61	0.20	1.42
ABGII	Reflection porous	11	180.4	2	1.11	0.13	4.00
ABGII	RM Pressfit cup	91	463.5	8	1.73	0.75	3.40
ABGII	SPH Acetabular cup	1	17.7	0	0.00	0.00	20.89
ABGII	Trident	353	5002.4	45	0.90	0.66	1.20
ABGII	Trilogy	1	10.7	0	0.00	0.00	34.55
ABGII	Titanium	31	276.8	4	1.45	0.39	3.70
ABGII	Weber	1	1.4	1	71.62	1.81	399.03
Accolade	CCB	5	50.2	0	0.00	0.00	7.34
Accolade	CLS Expansion	2	17.9	1	5.58	0.14	31.10
Accolade	Contemporary	41	346.7	4	1.15	0.31	2.95

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Accolade	Continuum TM	2	4.0	1	24.76	0.63	137.97
Accolade	Delta Revision TT Cup	2	19.3	0	0.00	0.00	19.10
Accolade	Delta-PF Cup	2	33.5	0	0.00	0.00	11.01
Accolade	Duraloc	17	246.2	2	0.81	0.10	2.93
Accolade	Exeter X3	1	8.2	0	0.00	0.00	45.15
Accolade	Mitch TRH	42	422.7	15	3.55	1.99	5.85
Accolade	Monoblock Acetabular Cup	20	228.7	1	0.44	0.01	2.44
Accolade	Morscher	3	31.8	0	0.00	0.00	11.59
Accolade	Muller PE cup	114	1337.0	10	0.75	0.33	1.33
Accolade	Osteolock	4	51.9	0	0.00	0.00	7.11
Accolade	Pinnacle	180	2018.7	3	0.15	0.03	0.43
Accolade	Reflection cemented	1	2.0	0	0.00	0.00	188.97
Accolade	RM Pressfit cup	18	203.4	1	0.49	0.01	2.74
Accolade	Trabecular Metal Shell	15	164.5	1	0.61	0.02	3.39
Accolade	Trident	1,907	25509.2	102	0.40	0.33	0.49
Accolade	Trident tritanium	7	80.9	0	0.00	0.00	4.56
Accolade	Trilogy	5	57.4	0	0.00	0.00	6.42
Accolade	Tritanium	152	1463.3	3	0.21	0.04	0.60
Accolade	ZCA	1	5.6	0	0.00	0.00	65.79
Accolade Hfx	Contemporary	1	3.6	0	0.00	0.00	102.85
Accolade Hfx	Monoblock Acetabular Cup	1	4.4	0	0.00	0.00	83.95
Accolade Hfx	Trident	2	13.5	0	0.00	0.00	27.29
Accolade II	Contemporary	14	75.1	0	0.00	0.00	4.91
Accolade II	Continuum TM	234	399.5	7	1.75	0.70	3.61
Accolade II	Delta Revision TT Cup	2	3.4	0	0.00	0.00	107.53
Accolade II	Delta-One-TT Cup	5	20.5	0	0.00	0.00	17.97
Accolade II	Delta-PF Cup	1	4.5	0	0.00	0.00	81.26
Accolade II	Delta-TT Cup	73	324.5	1	0.31	0.01	1.72
Accolade II	Exeter X3	7	23.4	1	4.28	0.11	23.86
Accolade II	Fitmore	110	258.3	2	0.77	0.09	2.80
Accolade II	G7 acetabular	1	1.1	0	0.00	0.00	336.84
Accolade II	Pinnacle	9	20.3	0	0.00	0.00	18.16
Accolade II	R3 porous	1	4.1	0	0.00	0.00	90.18
Accolade II	Reflection cemented	1	2.8	1	35.67	0.90	198.73
Accolade II	RM Pressfit cup	239	491.2	6	1.22	0.45	2.66
Accolade II	Trabecular Metal Rev shell	1	4.7	0	0.00	0.00	78.98
Accolade II	Trabecular Metal Shell	1	2.1	0	0.00	0.00	177.99
Accolade II	Trident	1,580	5605.2	30	0.54	0.36	0.76
Accolade II	Trident II Tritanium	153	186.0	3	1.61	0.33	4.71



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Accolade II	Trident tritanium	1	3.2	0	0.00	0.00	113.61
Accolade II	Trilogy	36	103.6	0	0.00	0.00	3.56
Accolade II	Tritanium	1,555	5874.8	41	0.70	0.50	0.95
Actinia	EcoFit	1	6.4	0	0.00	0.00	57.38
Actis Duofix	Pinnacle	58	36.2	1	2.76	0.07	15.37
Actis Duofix	RM Pressfit cup	4	3.5	0	0.00	0.00	106.68
Acumatch	Trabecular Metal Shell	1	16.8	0	0.00	0.00	21.99
Alloclassic SL	Durom	1	11.2	0	0.00	0.00	33.06
Alloclassic SL	Trabecular Metal Shell	1	0.2	1	468.27	11.86	2609.03
Alloclassic SL	Trilogy	15	175.7	1	0.57	0.01	3.17
AML	Charnley	1	13.4	0	0.00	0.00	27.44
AML	Duraloc	54	872.3	9	1.03	0.47	1.96
AML	Exeter	1	3.1	0	0.00	0.00	117.26
AML MMA	Duraloc	80	1233.2	14	1.14	0.62	1.90
AML MMA	Exeter	1	7.9	0	0.00	0.00	46.75
Anato Hip stem	Trident	37	173.6	1	0.58	0.00	3.21
Anatomical stem	Muller PE cup	1	16.5	0	0.00	0.00	22.38
Anthology Porous	BHR Acetabular Cup	93	844.0	51	6.04	4.45	7.88
Anthology Porous	BHR dysplasia cup	1	11.0	0	0.00	0.00	33.68
Anthology Porous	R3 porous	68	576.1	34	5.90	4.09	8.25
Anthology Porous	Reflection porous	1	13.7	0	0.00	0.00	26.91
Anthology Porous	Trident	2	19.9	0	0.00	0.00	18.53
Arcos Modular	G7 acetabular shell	3	1.2	0	0.00	0.00	299.41
ARCOS modular	Continuum TM	8	28.5	2	7.01	0.85	25.31
ARCOS modular	Exeter X3	1	0.3	0	0.00	0.00	1347.36
ARCOS modular	G7 acetabular	24	58.3	2	3.43	0.42	12.39
ARCOS modular	G7 acetabular shell	6	2.3	0	0.00	0.00	163.91
ARCOS modular	Multipolar Bipolar	2	0.5	0	0.00	0.00	680.49
ARCOS modular	Pinnacle	3	9.3	0	0.00	0.00	39.69
ARCOS modular	R3 porous	11	43.7	0	0.00	0.00	8.45
ARCOS modular	Reflection cemented	2	7.1	0	0.00	0.00	51.90
ARCOS modular	Trabecular Metal Shell	20	27.1	1	3.69	0.00	20.53
ARCOS modular	Trident	4	9.9	3	30.26	6.24	88.44
ARCOS modular	Tritanium	1	8.3	0	0.00	0.00	44.19
ARCOS modular	ZCA all-poly cup	1	0.1	0	0.00	0.00	4346.33
Aura II	Delta-PF Cup	1	14.0	0	0.00	0.00	26.42
Aura II	Recap Resurfacing Acetabular S	1	13.8	0	0.00	0.00	26.68
Avenir Complete	G7 acetabular shell	8	2.0	0	0.00	0.00	185.84
Avenir Complete uncemented	G7 acetabular	3	1.8	0	0.00	0.00	207.93

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Avenir Complete uncemented	G7 acetabular shell	5	1.9	0	0.00	0.00	189.77
Avenir Muller uncemented	Continuum TM	182	1485.5	14	0.94	0.52	1.58
Avenir Muller uncemented	Fitmore	70	387.7	2	0.52	0.06	1.86
Avenir Muller uncemented	G7 acetabular	20	32.1	0	0.00	0.00	11.50
Avenir Muller uncemented	G7 acetabular shell	1	0.5	0	0.00	0.00	698.12
Avenir Muller uncemented	Marathon cemented	1	2.0	0	0.00	0.00	187.39
Avenir Muller uncemented	Monoblock Acetabular Cup	11	117.9	0	0.00	0.00	3.13
Avenir Muller uncemented	Natural	10	80.4	0	0.00	0.00	4.59
Avenir Muller uncemented	Pinnacle	99	1071.1	3	0.28	0.04	0.75
Avenir Muller uncemented	RM cup	105	1064.1	5	0.47	0.13	1.03
Avenir Muller uncemented	RM Pressfit cup	53	299.3	1	0.33	0.01	1.86
Avenir Muller uncemented	Trabecular Metal Shell	38	381.2	2	0.52	0.06	1.90
Avenir Muller uncemented	Trilogy	2	13.5	0	0.00	0.00	27.30
Avenir Muller uncemented	Tritanium	91	864.3	2	0.23	0.03	0.84
Basis	CCB	7	34.4	0	0.00	0.00	10.74
Basis	Continuum TM	1	2.5	0	0.00	0.00	145.03
Basis	Delta-PF Cup	1	5.9	0	0.00	0.00	62.21
Basis	Delta-TT Cup	1	10.5	0	0.00	0.00	35.28
Basis	Duraloc	4	57.8	0	0.00	0.00	6.39
Basis	R3 porous	20	132.3	2	1.51	0.18	5.46
Basis	Reflection cemented	22	126.3	2	1.58	0.09	5.72
Basis	Reflection porous	108	1045.1	2	0.19	0.02	0.69
Basis	RM cup	1	17.1	0	0.00	0.00	21.56
Basis	RM Pressfit cup	23	247.8	0	0.00	0.00	1.49
Basis	Trabecular Metal Shell	1	13.4	0	0.00	0.00	27.44
Bi-metric	Continuum TM	1	0.1	1	1304.46	33.03	7268.01
Bi-metric	Exceed ABT Acetabular Porous	33	311.6	2	0.64	0.08	2.32
Bi-metric	Exceed ABT Ringloc-X	17	150.9	0	0.00	0.00	2.44
Bi-metric	Recap Resurfacing Acetabular S	24	288.4	4	1.39	0.38	3.55
Bi-metric cemented	Recap Resurfacing Acetabular S	1	16.3	0	0.00	0.00	22.58
C-Stem	ABGII	3	38.1	0	0.00	0.00	9.69
C-Stem	Charnley	8	101.5	3	2.95	0.61	8.63
C-Stem	Charnley Cup Ogee	10	110.2	1	0.91	0.02	5.06
C-Stem	Contemporary	3	30.3	0	0.00	0.00	12.17
C-Stem	Duraloc	72	947.2	8	0.84	0.36	1.66
C-Stem	Elite Plus LPW	12	144.9	1	0.69	0.02	3.84
C-Stem	Elite Plus Ogee	55	568.8	2	0.35	0.04	1.27



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
C-Stem	Exeter	1	15.7	0	0.00	0.00	23.53
C-Stem	Marathon cemented	94	537.3	0	0.00	0.00	0.69
C-Stem	Monoblock Acetabular Cup	2	37.0	0	0.00	0.00	9.97
C-Stem	Morscher	31	378.2	5	1.32	0.43	3.09
C-Stem	Muller PE cup	27	297.9	1	0.34	0.01	1.87
C-Stem	Pinnacle	85	470.3	4	0.85	0.23	2.18
C-Stem	RM cup	1	4.4	1	22.59	0.57	125.85
C-Stem	RM Pressfit cup	17	202.1	2	0.99	0.12	3.58
C-Stem	Trilogy	2	20.5	0	0.00	0.00	17.97
C-Stem	ZCA	1	0.3	0	0.00	0.00	1320.94
C-stem AMT	Pinnacle	7	2.2	1	44.93	1.14	250.31
C-Stem AMT	Bi-Mentum Cemented Cup	6	6.1	0	0.00	0.00	60.69
C-Stem AMT	Bi-Mentum Pressfit cup	25	19.4	0	0.00	0.00	19.02
C-Stem AMT	Contemporary	3	18.1	0	0.00	0.00	20.36
C-Stem AMT	DeltaMotion Cup	1	10.7	0	0.00	0.00	34.40
C-Stem AMT	Duraloc	43	442.6	3	0.68	0.14	1.98
C-Stem AMT	Durasul	2	11.5	0	0.00	0.00	31.94
C-Stem AMT	Elite Plus LPW	23	243.1	2	0.82	0.10	2.97
C-Stem AMT	Elite Plus Ogee	13	110.1	0	0.00	0.00	3.35
C-Stem AMT	Fitmore	3	12.3	0	0.00	0.00	29.95
C-Stem AMT	Fixa Duplex Cem Cup	1	0.1	0	0.00	0.00	2591.08
C-Stem AMT	G7 acetabular	1	1.3	0	0.00	0.00	289.13
C-Stem AMT	Marathon cemented	368	2422.9	15	0.62	0.35	1.02
C-Stem AMT	MUTARS	1	0.7	0	0.00	0.00	543.29
C-Stem AMT	Pinnacle	3,389	15257.2	99	0.65	0.53	0.79
C-Stem AMT	Protrusio Cage	1	0.6	0	0.00	0.00	615.23
C-Stem AMT	RM Pressfit cup	132	783.9	5	0.64	0.21	1.49
C-Stem AMT	Trabecular Metal Shell	5	25.2	0	0.00	0.00	14.62
C-Stem AMT	Trident	6	15.7	1	6.35	0.16	35.38
C-Stem AMT	Trident tritanium	2	5.4	0	0.00	0.00	68.05
C-Stem AMT	Tritanium	30	64.1	2	3.12	0.38	11.27
C-Stem AMT	Ultima	39	381.9	1	0.26	0.01	1.46
C-Stem AMT	ZCA all-poly cup	1	1.4	1	71.76	1.82	399.81
C2 Femoral Stem	Delta-PF Cup	1	16.1	0	0.00	0.00	22.85
CBC	CLS Expansion	4	48.4	1	2.06	0.05	11.50
CBC	Delta Revision TT Cup	2	10.0	0	0.00	0.00	36.81
CBC	Delta-One-TT Cup	4	23.3	1	4.30	0.11	23.95
CBC	Delta-TT Cup	4	25.2	1	3.96	0.10	22.07
CBC	Duraloc	11	167.3	0	0.00	0.00	2.21

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
CBC	Durom	4	33.1	1	3.02	0.08	16.81
CBC	Expansys shell	183	2108.4	29	1.38	0.92	1.98
CBC	Fitmore	59	756.0	5	0.66	0.21	1.54
CBC	Monoblock Acetabular Cup	2	10.8	0	0.00	0.00	34.27
CBC	Morscher	22	278.5	0	0.00	0.00	1.32
CBC	Reflection porous	4	37.3	1	2.68	0.07	14.93
CBC	RM Pressfit cup	445	3772.2	25	0.66	0.42	0.96
CBC	Selexys TPS	45	436.4	4	0.92	0.25	2.35
CBC	Trabecular Metal Shell	1	5.8	1	17.24	0.44	96.04
CBC	Trident	6	81.7	1	1.22	0.03	6.82
CBC	Trident tritanium	2	13.0	0	0.00	0.00	28.35
CBC	Titanium	1	5.0	0	0.00	0.00	73.31
CCA SS	ABGII	15	192.0	4	2.08	0.57	5.33
CCA SS	Bio-clad poly	11	80.5	1	1.24	0.03	6.92
CCA SS	CCB	784	6880.1	38	0.55	0.39	0.76
CCA SS	CLS Expansion	1	9.0	1	11.07	0.28	61.71
CCA SS	Contemporary	78	848.7	10	1.18	0.52	2.09
CCA SS	DS Evolution	1	2.1	0	0.00	0.00	172.52
CCA SS	Duraloc	69	935.0	27	2.89	1.86	4.14
CCA SS	Durom	1	12.0	0	0.00	0.00	30.76
CCA SS	Expansys shell	3	37.5	0	0.00	0.00	9.84
CCA SS	Fitmore	2	31.7	0	0.00	0.00	11.63
CCA SS	Kasselt Cup	1	5.9	0	0.00	0.00	62.81
CCA SS	M2A	5	50.4	1	1.98	0.05	11.05
CCA SS	Morscher	17	164.5	1	0.61	0.02	3.39
CCA SS	Muller PE cup	24	218.8	3	1.37	0.28	4.01
CCA SS	Reflection cemented	20	167.1	1	0.60	0.00	3.33
CCA SS	Reflection porous	5	59.2	0	0.00	0.00	6.23
CCA SS	RM cup	1	16.7	0	0.00	0.00	22.04
CCA SS	RM Pressfit cup	135	1414.2	7	0.49	0.20	1.02
CCA SS	Weber	27	240.1	1	0.42	0.01	2.32
CCA SS	ZCA	1	4.3	0	0.00	0.00	85.17
CCA SS	ZCA all-poly cup	2	8.7	0	0.00	0.00	42.40
CDH Total Hip	Exceed ABT Acetabular Porous	1	11.6	0	0.00	0.00	31.79
Cemtiv	Delta-PF Cup	1	7.7	0	0.00	0.00	47.98
Cemtiv	Fixa Ti Por	1	8.9	0	0.00	0.00	41.62
Centris cemented	RM Pressfit cup	1	3.8	0	0.00	0.00	97.92
Charnley	Charnley	461	5860.8	25	0.43	0.28	0.63
Charnley	Charnley Cup Ogee	303	4160.4	31	0.75	0.50	1.04



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Charnley	Contemporary	1	15.8	1	6.34	0.16	35.34
Charnley	Duraloc	55	782.1	20	2.56	1.51	3.87
Charnley	Elite Plus Ogee	2	29.3	1	3.41	0.09	18.99
Charnley	Marathon cemented	8	76.5	0	0.00	0.00	4.82
Charnley	Trilogy	27	458.9	11	2.40	1.20	4.29
Charnley	Wroblewski	11	95.4	0	0.00	0.00	3.87
Charnley	ZCA	1	11.5	0	0.00	0.00	32.15
Charnley Modular	Charnley	15	143.2	2	1.40	0.17	5.05
Charnley Modular	Charnley Cup Ogee	9	96.4	2	2.08	0.25	7.50
Charnley Modular	Duraloc	7	90.6	0	0.00	0.00	4.07
Charnley Modular	Elite Plus LPW	11	117.6	0	0.00	0.00	3.14
Charnley Modular	Elite Plus Ogee	29	305.3	0	0.00	0.00	1.21
Charnley Modular	Marathon cemented	8	80.1	0	0.00	0.00	4.60
Charnley Modular	Pinnacle	14	126.0	2	1.59	0.19	5.73
Charnley Modular	RM Pressfit cup	1	7.0	0	0.00	0.00	52.80
Charnley Modular	Trilogy	1	14.2	0	0.00	0.00	25.94
Charnley Rev	Charnley	9	66.5	1	1.50	0.04	8.37
Charnley Rev	Charnley Cup Ogee	8	123.9	1	0.81	0.02	4.50
Charnley Rev	Duraloc	7	80.9	0	0.00	0.00	4.56
Charnley Rev	Elite Plus LPW	1	0.6	0	0.00	0.00	580.76
CLS	ABGII	33	507.5	7	1.38	0.55	2.84
CLS	Allofit	192	2336.3	23	0.98	0.62	1.48
CLS	Artek	59	786.2	26	3.31	2.11	4.77
CLS	BHR Acetabular Cup	14	158.1	3	1.90	0.39	5.55
CLS	CCB	1	14.1	0	0.00	0.00	26.17
CLS	CLS Expansion	1,269	18109.5	142	0.78	0.66	0.92
CLS	Contemporary	13	157.5	2	1.27	0.15	4.59
CLS	Continuum TM	990	5310.4	26	0.49	0.32	0.72
CLS	Delta-PF Cup	23	324.4	1	0.31	0.01	1.72
CLS	Delta-TT Cup	11	83.3	0	0.00	0.00	4.43
CLS	DeltaMotion Cup	1	12.7	0	0.00	0.00	29.09
CLS	Duraloc	740	10984.2	120	1.09	0.91	1.31
CLS	Durom	198	2298.8	68	2.96	2.30	3.75
CLS	Elite Plus LPW	1	13.9	0	0.00	0.00	26.60
CLS	Elite Plus Ogee	2	38.2	0	0.00	0.00	9.66
CLS	Exeter	3	34.0	0	0.00	0.00	10.86
CLS	Expansys shell	1	16.8	0	0.00	0.00	21.99
CLS	Fitek	66	1347.1	9	0.67	0.31	1.27
CLS	Fitmore	2,414	29505.5	139	0.47	0.40	0.56
CLS	G7 acetabular	5	5.7	1	17.56	0.44	97.84

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
CLS	G7 acetabular shell	2	1.0	0	0.00	0.00	378.47
CLS	Hedrocel Acetabular Cup	2	20.7	1	4.82	0.12	26.88
CLS	Kasselt Cup	1	18.3	0	0.00	0.00	20.13
CLS	M2A	21	306.1	2	0.65	0.08	2.36
CLS	Metasul Low Profile Cup	1	19.1	0	0.00	0.00	19.28
CLS	Monoblock Acetabular Cup	80	1032.4	6	0.58	0.21	1.27
CLS	Morscher	1,701	27006.8	127	0.47	0.39	0.56
CLS	Muller PE cup	24	285.5	7	2.45	0.99	5.05
CLS	Osteolock	8	71.2	5	7.02	2.28	16.38
CLS	Pinnacle	124	883.2	3	0.34	0.07	0.99
CLS	PolarCup uncemented	4	35.8	0	0.00	0.00	10.30
CLS	R3 porous	4	25.7	0	0.00	0.00	14.37
CLS	RD Asian hip acetab. Cup	1	22.7	0	0.00	0.00	16.22
CLS	Reflection cemented	6	90.7	1	1.10	0.03	6.15
CLS	Reflection porous	425	4182.7	22	0.53	0.33	0.80
CLS	RM cup	114	1403.5	19	1.35	0.82	2.11
CLS	RM Pressfit cup	649	5398.9	34	0.63	0.43	0.87
CLS	Selexys TPS	9	76.4	1	1.31	0.03	7.29
CLS	Trabecular Metal Shell	59	545.0	3	0.55	0.08	1.47
CLS	Trident	208	2836.7	19	0.67	0.40	1.05
CLS	Trident II Tritanium	1	0.1	0	0.00	0.00	4491.21
CLS	Trilogy	742	6045.1	34	0.56	0.38	0.78
CLS	Tritanium	89	601.3	3	0.50	0.10	1.46
CLS	Weill ring	118	2091.3	12	0.57	0.30	1.00
CLS	ZCA	2	11.5	0	0.00	0.00	32.19
CLS	ZCA all-poly cup	3	18.9	0	0.00	0.00	19.49
Collarless Opti-Fix Femoral	Reflection porous	7	102.6	1	0.97	0.02	5.43
Collo-Mis	Delta-TT Cup	1	2.7	0	0.00	0.00	135.01
Cone Prosthesis	Fitek	1	19.1	0	0.00	0.00	19.34
Cone Prosthesis	Fitmore	1	7.5	1	13.35	0.34	74.38
Cone Prosthesis	Morscher	1	22.5	0	0.00	0.00	16.36
Cone Prosthesis	RM cup	2	28.6	1	3.50	0.09	19.48
Contemporary	Contemporary	81	1090.9	13	1.19	0.63	2.04
Corail	Acetabular Shell	1	0.5	0	0.00	0.00	774.35
Corail	ASR	156	1377.2	84	6.10	4.83	7.51
Corail	Bi-Mentum Pressfit cup	16	14.7	0	0.00	0.00	25.12
Corail	CCB	14	80.7	0	0.00	0.00	4.57
Corail	Charnley	1	13.5	0	0.00	0.00	27.33



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Corail	Charnley Cup Ogee	2	26.9	0	0.00	0.00	13.73
Corail	Contemporary	16	100.5	0	0.00	0.00	3.67
Corail	Continuum TM	336	2004.0	11	0.55	0.27	0.98
Corail	Custom device	1	5.5	0	0.00	0.00	66.54
Corail	Delta-One-TT Cup	6	22.1	0	0.00	0.00	16.66
Corail	Delta-PF Cup	83	1094.4	3	0.27	0.04	0.73
Corail	Delta-TT Cup	9	59.8	0	0.00	0.00	6.16
Corail	DeltaMotion Cup	78	747.7	1	0.13	0.00	0.75
Corail	Duraloc	468	6064.9	56	0.92	0.69	1.19
Corail	Durasul	1	4.4	0	0.00	0.00	83.84
Corail	Elite Cup Ogee	2	7.6	0	0.00	0.00	48.48
Corail	Elite Plus LPW	4	46.0	0	0.00	0.00	8.02
Corail	Elite Plus Ogee	12	127.9	1	0.78	0.02	4.36
Corail	EP-Fit Plus	1	12.9	0	0.00	0.00	28.68
Corail	Exceed ABT Ringloc-X	12	102.1	0	0.00	0.00	3.61
Corail	Exeter	1	5.9	0	0.00	0.00	62.81
Corail	Fitmore	352	1794.3	15	0.84	0.47	1.38
Corail	Fixa Ti Por	1	0.2	0	0.00	0.00	2406.01
Corail	G7 acetabular	108	331.0	1	0.30	0.01	1.68
Corail	G7 acetabular shell	12	4.9	0	0.00	0.00	75.15
Corail	Mallory-Head	1	7.6	1	13.18	0.33	73.41
Corail	Marathon cemented	31	271.9	2	0.74	0.09	2.66
Corail	Monoblock Acetabular Cup	95	1173.8	8	0.68	0.29	1.34
Corail	Morscher	3	42.3	0	0.00	0.00	8.73
Corail	Mueller Cup	1	5.6	0	0.00	0.00	65.89
Corail	Muller PE cup	2	17.5	1	5.71	0.14	31.83
Corail	Pinnacle	15,093	82841.8	461	0.56	0.51	0.61
Corail	PolarCup cemented	6	21.4	0	0.00	0.00	17.21
Corail	PolarCup uncemented	21	91.5	2	2.19	0.26	7.90
Corail	R3 porous	16	133.6	1	0.75	0.02	4.17
Corail	Reflection cemented	18	130.0	0	0.00	0.00	2.84
Corail	Reflection porous	140	1667.5	6	0.36	0.11	0.74
Corail	RM Pressfit cup	167	935.5	7	0.75	0.30	1.54
Corail	Selexys TPS	1	12.1	0	0.00	0.00	30.55
Corail	Sunfit	1	4.8	0	0.00	0.00	77.17
Corail	Trabecular Metal Rev shell	4	15.2	0	0.00	0.00	24.22
Corail	Trabecular Metal Shell	23	186.1	1	0.54	0.00	2.51
Corail	Trident	115	776.9	3	0.39	0.08	1.13
Corail	Trident II Titanium	51	55.2	1	1.81	0.05	10.10

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Corail	Trident PSL HA Solid Back	2	0.5	0	0.00	0.00	783.35
Corail	Trident tritanium	2	14.8	0	0.00	0.00	25.00
Corail	Trilogy	235	1515.4	4	0.26	0.07	0.68
Corail	Tritanium	182	1318.3	5	0.38	0.10	0.83
Corail	Ultima	135	1290.8	4	0.31	0.08	0.79
Corail	ZCA	3	27.9	0	0.00	0.00	13.21
Corail	ZCA all-poly cup	1	0.4	1	278.82	7.06	1553.47
Corail Cementless Stem	Pinnacle	4	1.1	0	0.00	0.00	339.39
Corail Cementless Stem	R3 porous	1	0.4	0	0.00	0.00	898.24
CPCS	BHR Acetabular Cup	10	106.3	4	3.76	0.80	9.64
CPCS	Exeter X3	1	7.5	0	0.00	0.00	49.48
CPCS	G7 acetabular	2	5.5	0	0.00	0.00	67.07
CPCS	R3 porous	368	1747.8	7	0.40	0.14	0.79
CPCS	Reflection cemented	25	171.7	1	0.58	0.00	3.24
CPCS	Reflection porous	82	1046.7	19	1.82	1.09	2.83
CPCS	Trabecular Metal Rev shell	1	0.1	0	0.00	0.00	6736.82
CPCS	Trabecular Metal Shell	6	13.9	2	14.43	1.75	52.12
CPT	Allofit	1	10.1	0	0.00	0.00	36.63
CPT	Avantage cemented	1	1.6	0	0.00	0.00	233.92
CPT	BHR Acetabular Cup	1	4.0	0	0.00	0.00	91.28
CPT	Bio-clad poly	1	1.7	0	0.00	0.00	223.07
CPT	CCB	1	6.4	0	0.00	0.00	57.70
CPT	CLS Expansion	43	518.7	4	0.77	0.21	1.97
CPT	Contemporary	1	5.4	0	0.00	0.00	68.32
CPT	Continuum TM	1,791	9328.0	59	0.63	0.48	0.81
CPT	Delta-One-TT Cup	1	0.8	0	0.00	0.00	434.63
CPT	Delta-TT Cup	128	475.8	3	0.63	0.13	1.84
CPT	Duraloc	413	5201.9	43	0.83	0.60	1.11
CPT	Elite Plus LPW	1	21.8	0	0.00	0.00	16.95
CPT	Exceed ABT Ringloc-X	9	66.1	0	0.00	0.00	5.58
CPT	Exeter	1	11.2	0	0.00	0.00	33.04
CPT	Exeter X3	2	14.7	0	0.00	0.00	25.12
CPT	Fitmore	195	1501.8	12	0.80	0.41	1.40
CPT	G7 acetabular	119	339.1	7	2.06	0.83	4.25
CPT	G7 acetabular shell	10	2.0	0	0.00	0.00	185.84
CPT	G7 Osseo Ti Multihole	1	0.4	0	0.00	0.00	898.24
CPT	G7 OsseoTi Cementless	2	0.5	0	0.00	0.00	774.35
CPT	HGP 2 acetabular comp.	1	3.8	0	0.00	0.00	97.85
CPT	Marathon cemented	1	12.6	0	0.00	0.00	29.27



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
CPT	Max-Ti acetabular reconstruction	1	0.6	0	0.00	0.00	601.50
CPT	Monoblock Acetabular Cup	84	1105.6	8	0.72	0.28	1.37
CPT	Morscher	3	35.3	0	0.00	0.00	10.44
CPT	Muller PE cup	3	35.9	0	0.00	0.00	10.27
CPT	Pinnacle	66	631.6	2	0.32	0.04	1.14
CPT	Reflection cemented	11	76.2	3	3.94	0.81	11.51
CPT	RM Pressfit cup	21	93.4	1	1.07	0.03	5.96
CPT	Trabecular Metal Rev shell	6	25.1	0	0.00	0.00	14.67
CPT	Trabecular Metal Shell	43	253.6	3	1.18	0.24	3.46
CPT	Trident	158	2143.7	16	0.75	0.43	1.21
CPT	Trilogy	856	8061.8	62	0.77	0.58	0.98
CPT	Tritanium	85	830.1	7	0.84	0.30	1.66
CPT	ZCA	572	6238.7	42	0.67	0.48	0.90
CPT	ZCA all-poly cup	99	661.3	1	0.15	0.00	0.84
Customized V40	Duraloc	1	2.2	1	46.47	1.18	258.91
DSP Thrust Plate	CLS Expansion	60	1031.9	9	0.87	0.40	1.66
DSP Thrust Plate	Fitek	43	824.0	10	1.21	0.58	2.23
DSP Thrust Plate	Fitmore	123	2451.3	23	0.94	0.59	1.41
DSP Thrust Plate	Morscher	15	335.4	0	0.00	0.00	1.10
Echelon	PolarCup uncemented	1	6.2	0	0.00	0.00	59.22
Echelon	R3 porous	4	22.9	0	0.00	0.00	16.11
Echelon	Reflection cemented	1	1.4	1	72.47	1.83	403.78
Echelon	Reflection porous	8	76.3	3	3.93	0.81	11.49
Echelon cemented	Pinnacle	1	0.8	0	0.00	0.00	479.49
Echelon cemented	R3 porous	1	2.1	0	0.00	0.00	172.96
Echelon cemented	Reflection cemented	2	6.0	0	0.00	0.00	61.66
Echo Bi-Metric	Continuum TM	176	565.9	4	0.71	0.19	1.81
Echo Bi-Metric	Exceed ABT Acetabular Porous	15	126.2	0	0.00	0.00	2.92
Echo Bi-Metric	Exceed ABT Ringloc-X	57	473.3	1	0.21	0.01	1.18
Echo Bi-Metric	G7 acetabular	983	2719.6	16	0.59	0.34	0.96
Echo Bi-Metric	G7 acetabular shell	150	47.3	0	0.00	0.00	7.80
Echo Bi-Metric	G7 OsseoTi Cementless	3	0.3	0	0.00	0.00	1151.59
Echo Bi-Metric	Recap Resurfacing Acetabular S	1	5.6	1	17.76	0.45	98.93
Echo Bi-Metric	Recap/Magnum Acetabular Shell	2	12.8	0	0.00	0.00	28.78
Echo Bi-Metric	Regenerex Ringloc	1	7.5	0	0.00	0.00	49.28
Echo Bi-Metric	RM Pressfit cup	2	9.5	0	0.00	0.00	38.67

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Echo Bi-Metric	Trabecular Metal Rev shell	3	6.1	0	0.00	0.00	60.42
Echo Bi-Metric	Trabecular Metal Shell	16	15.2	3	19.71	4.07	57.62
Echo Bi-Metric	Trident	2	1.4	0	0.00	0.00	254.70
Echo Bi-Metric	ZCA all-poly cup	1	9.3	0	0.00	0.00	39.52
Echo Bi-Metric Std	G7 acetabular shell	2	0.1	0	0.00	0.00	2994.14
Echo Press-Fit	G7 acetabular shell	2	0.9	0	0.00	0.00	403.40
Elite plus	Acetabular Revision	3	53.4	0	0.00	0.00	6.90
Elite plus	Charnley	302	3956.1	26	0.66	0.42	0.95
Elite plus	Charnley Cup Ogee	43	631.8	10	1.58	0.76	2.91
Elite plus	Contemporary	1	4.0	0	0.00	0.00	92.60
Elite plus	Duraloc	984	13257.8	219	1.65	1.44	1.89
Elite plus	Elite Plus LPW	284	3344.8	18	0.54	0.32	0.85
Elite plus	Elite Plus Ogee	111	1140.7	6	0.53	0.19	1.14
Elite plus	Exeter	1	8.9	0	0.00	0.00	41.65
Elite plus	Hedrocel Acetabular Cup	1	18.6	0	0.00	0.00	19.81
Elite plus	Kasselt Cup	1	12.1	0	0.00	0.00	30.49
Elite plus	Monoblock Acetabular Cup	3	52.1	1	1.92	0.05	10.70
Elite plus	RM cup	11	114.5	1	0.87	0.02	4.86
Elite plus	Trilogy	3	45.6	1	2.19	0.06	12.21
Elite Plus Rev	Contemporary	1	1.1	0	0.00	0.00	331.05
Elite Plus Rev	Elite Plus LPW	1	7.0	0	0.00	0.00	53.07
Elite Plus Rev	Elite Plus Ogee	1	2.6	0	0.00	0.00	143.80
Emperion	Continuum TM	31	280.3	3	1.07	0.22	3.13
Emperion	R3 porous	38	374.6	3	0.80	0.17	2.34
Emperion	Reflection cemented	1	2.7	0	0.00	0.00	138.76
Emperion	Reflection porous	2	22.9	0	0.00	0.00	16.09
Emperion	Trabecular Metal Shell	1	1.2	0	0.00	0.00	309.03
Emperion	Trilogy	1	9.7	0	0.00	0.00	38.18
Exeter	ABGII	36	596.8	3	0.50	0.10	1.47
Exeter	Bio-clad poly	113	1289.0	7	0.54	0.19	1.07
Exeter	Charnley	6	96.1	1	1.04	0.03	5.80
Exeter	Charnley Cup Ogee	1	13.0	0	0.00	0.00	28.38
Exeter	CLS Expansion	187	2468.9	13	0.53	0.28	0.90
Exeter	Contemporary	1,625	20085.7	204	1.02	0.88	1.16
Exeter	Duraloc	916	14350.7	176	1.23	1.05	1.42
Exeter	Elite Plus LPW	1	6.2	0	0.00	0.00	59.75
Exeter	Elite Plus Ogee	5	90.0	1	1.11	0.03	6.19
Exeter	Exeter	1,376	16795.4	124	0.74	0.61	0.88
Exeter	Fitek	3	65.6	0	0.00	0.00	5.62



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter	Fitmore	35	540.7	4	0.74	0.20	1.89
Exeter	Hedrocel Acetabular Cup	15	249.3	0	0.00	0.00	1.48
Exeter	Kasselt Cup	21	155.5	0	0.00	0.00	2.37
Exeter	Monoblock Acetabular Cup	13	177.1	1	0.56	0.00	3.15
Exeter	Morscher	580	9553.9	43	0.45	0.33	0.61
Exeter	Muller PE cup	132	1748.7	10	0.57	0.27	1.05
Exeter	Osteolock	2,051	29872.2	153	0.51	0.43	0.60
Exeter	Pinnacle	1	12.5	0	0.00	0.00	29.42
Exeter	RD Asian hip acetab. Cup	2	46.4	0	0.00	0.00	7.95
Exeter	Reflection cemented	43	443.0	2	0.45	0.05	1.63
Exeter	Reflection porous	42	567.6	7	1.23	0.50	2.54
Exeter	RM cup	12	116.5	1	0.86	0.02	4.78
Exeter	Trident	163	2722.0	3	0.11	0.02	0.32
Exeter	Trilogy	381	5765.0	14	0.24	0.13	0.41
Exeter	Vitalock	71	822.6	10	1.22	0.58	2.24
Exeter	Weber	21	294.1	1	0.34	0.01	1.89
Exeter	ZCA	21	219.0	3	1.37	0.28	4.00
Exeter Cemented Stem	G7 acetabular shell	2	0.6	0	0.00	0.00	596.18
Exeter Cemented Stem	Trident	2	0.4	0	0.00	0.00	916.57
Exeter Cemented Stem	Trident II Tritanium	1	0.1	0	0.00	0.00	3133.40
Exeter V40	ADM	19	177.0	0	0.00	0.00	2.08
Exeter V40	Avantage	8	2.0	0	0.00	0.00	182.57
Exeter V40	Avantage Cem Acet Cup	1	0.3	0	0.00	0.00	1192.36
Exeter V40	Avantage cemented	46	76.8	2	2.60	0.32	9.40
Exeter V40	Bio-clad poly	140	1200.2	8	0.67	0.29	1.31
Exeter V40	CCB	606	4146.4	16	0.39	0.21	0.63
Exeter V40	CCB Low Profile Cup	2	0.2	0	0.00	0.00	2323.04
Exeter V40	Charnley	7	73.8	1	1.36	0.03	7.55
Exeter V40	CLS Expansion	105	1346.6	4	0.30	0.08	0.76
Exeter V40	Contemporary	6,667	59496.5	276	0.46	0.41	0.52
Exeter V40	Continuum TM	3,035	17488.1	110	0.63	0.52	0.76
Exeter V40	Custom device	3	3.6	0	0.00	0.00	103.33
Exeter V40	Delta Revision TT Cup	6	23.6	0	0.00	0.00	15.63
Exeter V40	Delta-One-TT Cup	16	68.1	0	0.00	0.00	5.42
Exeter V40	Delta-PF Cup	26	283.2	1	0.35	0.01	1.97
Exeter V40	Delta-TT Cup	322	1511.8	9	0.60	0.27	1.13
Exeter V40	DS Evolution	13	30.3	0	0.00	0.00	12.19
Exeter V40	Duraloc	1,212	15541.7	153	0.98	0.83	1.15

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter V40	Elite Plus Ogee	10	100.8	0	0.00	0.00	3.66
Exeter V40	EP-Fit Plus	8	106.7	0	0.00	0.00	3.46
Exeter V40	Exceed ABT Ringloc-X	24	177.3	0	0.00	0.00	2.08
Exeter V40	Exeter	1,636	17233.2	96	0.56	0.45	0.68
Exeter V40	Exeter Rimfit Cup	2	0.3	0	0.00	0.00	1113.52
Exeter V40	Exeter X3	2,999	13975.0	52	0.37	0.28	0.49
Exeter V40	Fitmore	1,177	7905.8	11	0.14	0.07	0.24
Exeter V40	Fixa Ti Por	9	13.1	0	0.00	0.00	28.11
Exeter V40	G7 acetabular	367	917.1	5	0.55	0.18	1.27
Exeter V40	G7 acetabular shell	106	27.7	0	0.00	0.00	13.32
Exeter V40	G7 Osseo Ti Multihole	4	0.6	0	0.00	0.00	612.44
Exeter V40	Kasselt Cup	5	30.3	0	0.00	0.00	12.16
Exeter V40	Low-profile cup PE	1	0.3	0	0.00	0.00	1271.10
Exeter V40	Marathon cemented	7	52.0	1	1.92	0.05	10.72
Exeter V40	Mitch TRH	35	393.4	10	2.54	1.22	4.67
Exeter V40	Monoblock Acetabular Cup	123	1822.2	5	0.27	0.09	0.64
Exeter V40	Morscher	630	8393.7	37	0.44	0.31	0.60
Exeter V40	Mueller Cup	5	5.9	0	0.00	0.00	62.23
Exeter V40	Muller PE cup	94	1001.5	3	0.30	0.06	0.88
Exeter V40	MUTARS	1	0.1	0	0.00	0.00	3849.61
Exeter V40	Osteolock	681	8954.2	36	0.40	0.28	0.55
Exeter V40	Pinnacle	3,420	19181.6	82	0.43	0.34	0.53
Exeter V40	PolarCup cemented	70	199.3	1	0.50	0.01	2.80
Exeter V40	PolarCup Cemented	7	3.4	0	0.00	0.00	109.01
Exeter V40	PolarCup uncemented	17	91.8	0	0.00	0.00	4.02
Exeter V40	Polymax	85	296.6	1	0.34	0.01	1.88
Exeter V40	R3 porous	820	3978.6	23	0.58	0.37	0.87
Exeter V40	Redapt Modular Shell	1	0.3	0	0.00	0.00	1448.78
Exeter V40	Reflection cemented	1,005	7456.0	29	0.39	0.26	0.56
Exeter V40	Reflection porous	545	5942.8	21	0.35	0.22	0.54
Exeter V40	Restoration	8	9.4	0	0.00	0.00	39.43
Exeter V40	Restoration Anatomic	3	9.8	0	0.00	0.00	37.58
Exeter V40	RM cup	1	18.4	0	0.00	0.00	20.04
Exeter V40	RM Pressfit cup	3,153	18003.0	55	0.31	0.23	0.40
Exeter V40	Roof Reinforcem.ring	1	0.4	0	0.00	0.00	826.60
Exeter V40	Selexys TPS	1	10.0	0	0.00	0.00	36.72
Exeter V40	SPH Acetabular cup	3	33.5	2	5.97	0.72	21.58
Exeter V40	Stanmore	6	75.0	0	0.00	0.00	4.92
Exeter V40	Trabecular Metal Rev shell	22	63.3	2	3.16	0.17	11.41



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter V40	Trabecular Metal Shell	257	1536.3	15	0.98	0.55	1.61
Exeter V40	Trident	14,304	100378.3	396	0.39	0.36	0.43
Exeter V40	Trident All Poly	25	46.7	0	0.00	0.00	7.90
Exeter V40	Trident Hemisphere Acetabular Shell	1	0.3	0	0.00	0.00	1283.20
Exeter V40	Trident II Tritanium	1,108	1281.3	4	0.31	0.07	0.74
Exeter V40	Trident PSL HA Cluster	4	0.8	0	0.00	0.00	476.10
Exeter V40	Trident tritanium	44	338.9	2	0.59	0.07	2.13
Exeter V40	Trilogy	3,529	30894.1	100	0.32	0.26	0.39
Exeter V40	Tritanium	4,034	21167.2	103	0.49	0.40	0.59
Exeter V40	Ultima	1	5.1	0	0.00	0.00	72.28
Exeter V40	Weber	53	624.1	1	0.16	0.00	0.89
Exeter V40	ZCA	103	716.7	1	0.14	0.00	0.78
Exeter V40	ZCA all-poly cup	110	596.7	0	0.00	0.00	0.62
Exeter V40	ZCA Reconstruction cage	1	2.9	0	0.00	0.00	128.57
F2L Multineck	Delta-PF Cup	12	181.5	2	1.10	0.13	3.98
F2L Multineck	SPH Acetabular cup	4	51.5	0	0.00	0.00	7.16
Femoral Integral	Trident II Tritanium	2	0.9	0	0.00	0.00	410.78
Femoral stem	Adaptive cup	8	30.3	0	0.00	0.00	12.16
Femoral stem	Fixa Duplex	1	2.3	0	0.00	0.00	161.36
Femoral taper titanium alloy	Kasselt Cup	1	1.2	0	0.00	0.00	296.78
Fiber Metal	Trilogy	2	40.0	0	0.00	0.00	9.22
Filler 3ND	Adaptive cup	5	17.8	0	0.00	0.00	20.68
Finn Rot. Hinge KNEE	Biomex acet shell porous	2	0.3	0	0.00	0.00	1161.52
Finn Rot. Hinge KNEE	Mallory-Head	1	0.3	0	0.00	0.00	1389.03
Fortress ND	Adaptive cup	10	37.9	0	0.00	0.00	9.74
Friendly	Contemporary	2	10.4	0	0.00	0.00	35.64
Friendly	Delta-One-TT Cup	4	6.3	0	0.00	0.00	58.71
Friendly	Delta-PF Cup	178	2166.0	6	0.28	0.10	0.60
Friendly	Delta-TT Cup	68	573.8	5	0.87	0.28	2.03
Friendly	Elevated Rim Cemented	6	46.1	2	4.34	0.53	15.66
Friendly	Mueller cup	3	47.4	0	0.00	0.00	7.79
Friendly	Mueller Cup	43	225.7	2	0.89	0.11	3.20
Friendly	Reflection cemented	1	0.5	0	0.00	0.00	756.95
Friendly	SPH Acetabular cup	2	30.3	1	3.30	0.08	18.40
Friendly	Trident	10	44.0	2	4.55	0.55	16.42
Friendly	ZCA	4	27.2	0	0.00	0.00	13.57
Friendly	ZCA all-poly cup	2	21.1	0	0.00	0.00	17.50

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
FTS	DeltaMotion Cup	1	2.4	1	41.70	1.06	232.31
Furlong	Acetabular Cup	9	66.3	2	3.01	0.37	10.89
Furlong	Delta-PF Cup	6	41.7	0	0.00	0.00	8.85
Furlong	Furlong	66	934.8	7	0.75	0.30	1.54
Furlong	Pinnacle	6	58.3	1	1.71	0.04	9.55
Furlong	Trident	1	1.0	1	100.62	2.55	560.62
Furlong Evolution Collared Ste	Delta-PF Cup	14	2.6	0	0.00	0.00	144.41
Furlong Evolution Collared Ste	Delta-TT Cup	1	0.0	0	0.00	0.00	7925.67
Furlong H-AC Stem	Acetabular Cup	13	93.2	1	1.07	0.03	5.98
Furlong H-AC Stem	Furlong	14	169.6	0	0.00	0.00	2.18
Furlong H-AC Stem	Pinnacle	6	56.9	1	1.76	0.04	9.79
GMRS	Acetabular Revision	1	16.1	0	0.00	0.00	22.91
GMRS	Contemporary	1	1.3	0	0.00	0.00	282.47
GMRS	Reflection porous	1	3.3	0	0.00	0.00	112.66
GMRS	Trabecular Metal Shell	1	10.6	0	0.00	0.00	34.86
GMRS	Trident	1	0.3	0	0.00	0.00	1271.10
GMRS	Trident tritanium	2	16.4	0	0.00	0.00	22.44
GMRS	Titanium	1	0.4	0	0.00	0.00	904.27
H-Max C	Delta-One-TT Cup	5	4.6	0	0.00	0.00	80.54
H-Max C	Delta-PF Cup	25	96.3	1	1.04	0.03	5.78
H-Max C	Delta-TT Cup	123	377.2	5	1.33	0.36	2.91
H-Max C	Exeter X3	1	2.4	0	0.00	0.00	151.39
H-Max C	Mueller Cup	9	40.1	0	0.00	0.00	9.20
H-Max C	RM Pressfit cup	3	14.8	0	0.00	0.00	24.94
H-Max C	Trident	1	5.8	0	0.00	0.00	63.20
H-Max M	Delta-PF Cup	141	1355.5	18	1.33	0.79	2.10
H-Max M	Delta-TT Cup	168	1700.7	9	0.53	0.24	1.00
H-Max M	DeltaMotion Cup	1	10.5	0	0.00	0.00	35.02
H-Max M	Fitmore	6	74.7	0	0.00	0.00	4.94
H-Max M	Monoblock Acetabular Cup	12	138.0	0	0.00	0.00	2.67
H-Max S	Delta-One-TT Cup	7	21.2	0	0.00	0.00	17.39
H-Max S	Delta-PF Cup	279	1265.0	9	0.71	0.33	1.35
H-Max S	Delta-TT Cup	963	5272.2	37	0.70	0.49	0.96
H-Max S	DeltaMotion Cup	16	158.0	1	0.63	0.02	3.53
H-Max S	RM Pressfit cup	5	25.0	0	0.00	0.00	14.78
H-Max S	Trident	67	227.2	1	0.44	0.01	2.45
Hip stem	Acetabular shell	1	21.4	0	0.00	0.00	17.23
Hip stem	Ceramic on ceramic shell	10	184.1	3	1.63	0.34	4.76



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Hip stem	Osteolock	2	36.9	0	0.00	0.00	10.01
Hip stem	Polyethylene Acetabular cup	1	3.1	0	0.00	0.00	119.03
Hip stem	Trident	20	353.7	2	0.57	0.07	2.04
Hydra-Fix	Fixa Ti Por	2	0.9	0	0.00	0.00	396.28
Hydra-Fix	Polymax	2	1.0	0	0.00	0.00	380.61
Hydra-Fix Cementless Stem	Fixa Duplex Cem Cup	1	0.1	0	0.00	0.00	3545.69
KAR	Duraloc	4	80.6	0	0.00	0.00	4.58
KAR	Pinnacle	1	15.2	0	0.00	0.00	24.19
Lateral straight stem	Avantage cemented	4	10.3	0	0.00	0.00	35.94
Lateral straight stem	CCB	5	50.9	0	0.00	0.00	7.25
Lateral straight stem	CLS Expansion	35	399.6	5	1.25	0.41	2.92
Lateral straight stem	Contemporary	3	21.2	0	0.00	0.00	17.41
Lateral straight stem	Continuum TM	78	652.3	3	0.46	0.09	1.34
Lateral straight stem	Delta-TT Cup	8	47.3	0	0.00	0.00	7.79
Lateral straight stem	Duraloc	40	435.6	8	1.84	0.79	3.62
Lateral straight stem	Durasul	23	101.5	0	0.00	0.00	3.63
Lateral straight stem	Fitek	2	16.9	0	0.00	0.00	21.83
Lateral straight stem	Fitmore	38	293.3	0	0.00	0.00	1.26
Lateral straight stem	M2A	2	26.8	1	3.73	0.09	20.79
Lateral straight stem	Marathon cemented	1	6.9	0	0.00	0.00	53.17
Lateral straight stem	Morscher	43	603.5	7	1.16	0.47	2.39
Lateral straight stem	Muller PE cup	770	7834.6	43	0.55	0.39	0.73
Lateral straight stem	Osteolock	3	34.0	0	0.00	0.00	10.86
Lateral straight stem	Pinnacle	2	18.9	0	0.00	0.00	19.55
Lateral straight stem	R3 porous	1	6.1	0	0.00	0.00	60.23
Lateral straight stem	Reflection porous	2	7.2	0	0.00	0.00	51.47
Lateral straight stem	Reinforcement cage	1	0.3	0	0.00	0.00	1360.97
Lateral straight stem	RM cup	534	6091.5	46	0.76	0.55	1.01
Lateral straight stem	RM Pressfit cup	173	1567.0	3	0.19	0.04	0.56
Lateral straight stem	SPH Acetabular cup	3	40.1	1	2.49	0.06	13.88
Lateral straight stem	Trident	34	387.5	12	3.10	1.60	5.41
Lateral straight stem	Trilogy	69	658.6	13	1.97	1.00	3.28
Lateral straight stem	Tritanium	1	2.8	0	0.00	0.00	131.32
Lateral straight stem	Weber	287	3113.7	11	0.35	0.17	0.61
Lateral straight stem	ZCA	98	895.3	1	0.11	0.00	0.62
Lateral straight stem	ZCA all-poly cup	70	574.9	0	0.00	0.00	0.64
Link stem with microporous	Duraloc	1	6.9	0	0.00	0.00	53.53
Link stem with microporous	S-ROM ZTT2 Acet. Shell	1	14.6	0	0.00	0.00	25.32
M/L Taper	CLS Expansion	4	49.5	0	0.00	0.00	7.45
M/L Taper	Continuum TM	1,054	7149.0	42	0.59	0.42	0.79

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
M/L Taper	Delta-One-TT Cup	1	0.5	1	184.47	4.67	1027.80
M/L Taper	Delta-TT Cup	64	483.8	6	1.24	0.46	2.70
M/L Taper	Durom	38	455.0	11	2.42	1.21	4.33
M/L Taper	Fitmore	6	63.9	0	0.00	0.00	5.77
M/L Taper	G7 acetabular	1	2.4	0	0.00	0.00	153.28
M/L Taper	Monoblock Acetabular Cup	1	16.2	0	0.00	0.00	22.78
M/L Taper	Osteolock	1	0.1	0	0.00	0.00	2807.01
M/L Taper	Trabecular Metal Shell	8	66.3	0	0.00	0.00	5.57
M/L Taper	Trident	333	1647.5	7	0.42	0.15	0.83
M/L Taper	Trilogy	215	2403.6	10	0.42	0.20	0.77
M/L Taper	Tritanium	3	36.6	0	0.00	0.00	10.08
Mallory proximal femoral	Bio-clad poly	1	2.4	0	0.00	0.00	154.34
Mallory proximal femoral	Contemporary	1	0.2	0	0.00	0.00	1772.85
Mallory proximal femoral	Exceed ABT Acetabular Porous	1	12.5	0	0.00	0.00	29.43
Mallory proximal femoral	Exceed ABT Ringloc-X	2	17.3	0	0.00	0.00	21.30
Mallory proximal femoral	Exeter	1	6.5	1	15.30	0.39	85.22
Mallory proximal femoral	Mallory-Head	1	14.4	0	0.00	0.00	25.60
Mallory proximal femoral	Trabecular Metal Rev shell	1	0.2	0	0.00	0.00	2072.87
Mallory proximal femoral	Trilogy	1	12.9	0	0.00	0.00	28.49
Mallory-Head	Acetabular Revision	1	0.3	0	0.00	0.00	1161.52
Mallory-Head	Bio-clad poly	2	11.6	0	0.00	0.00	31.85
Mallory-Head	Biomex acet shell porous	43	748.3	11	1.47	0.73	2.63
Mallory-Head	Exceed ABT Acetabular Porous	4	40.9	1	2.45	0.06	13.64
Mallory-Head	Exceed ABT Ringloc-X	4	17.9	0	0.00	0.00	20.55
Mallory-Head	M2A	105	1460.4	18	1.23	0.73	1.95
Mallory-Head	Mallory-Head	43	642.0	9	1.40	0.64	2.66
Mallory-Head	Recap Resurfacing Acetabular S	47	655.3	3	0.46	0.06	1.22
Mallory-Head	Reflection cemented	1	2.5	0	0.00	0.00	149.87
Mallory-Head	Trabecular Metal Shell	3	6.7	0	0.00	0.00	55.40
Mallory-Head	Vision Ring Loc	10	176.5	3	1.70	0.35	4.97
Margron Hip	Interseal acet shell quadrant	3	40.7	0	0.00	0.00	9.07
Margron Hip	Transcend Quadrant Shell	20	291.9	4	1.37	0.29	3.51
MasterSL	Delta-PF Cup	21	102.5	0	0.00	0.00	3.60
MasterSL	Delta-TT Cup	133	361.3	3	0.83	0.17	2.43
Meridian	Trident	1	20.1	0	0.00	0.00	18.38
Meridian TMZF	Duraloc	1	19.8	0	0.00	0.00	18.66



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Meridian TMZF	Trident	1	19.1	0	0.00	0.00	19.36
Metabloc	RM cup	12	149.7	2	1.34	0.16	4.82
Metafix	Cluster Shell Cementless	1	0.0	0	0.00	0.00	13473.63
Metafix	DS Evolution	1	2.7	0	0.00	0.00	136.10
Metafix	Trinity	119	197.8	3	1.52	0.21	4.05
Metafix	Trinity Cluster Shell	4	1.1	0	0.00	0.00	322.34
Mistral	DeltaMotion Cup	1	9.8	0	0.00	0.00	37.48
Mod revision	Marathon cemented	1	0.1	0	0.00	0.00	5389.45
Mod revision	RM Pressfit cup	1	7.1	0	0.00	0.00	51.68
Modular lateral stem	Muller PE cup	1	11.2	0	0.00	0.00	33.06
Modular Taperloc	Duraloc	2	32.3	0	0.00	0.00	11.41
Modular Taperloc	M2A	38	454.5	5	1.10	0.36	2.57
Modular Taperloc	Mallory-Head	3	36.1	1	2.77	0.07	15.41
Modular Taperloc	Recap Resurfacing Acetabular S	16	223.6	3	1.34	0.28	3.92
Modulus Hip	Atlas MS	2	33.4	0	0.00	0.00	11.05
Modulus Hip	Continuum TM	5	45.6	0	0.00	0.00	8.09
Modulus Hip	Custom device	2	0.0	2	5217.86	631.91	18848.69
Modulus Hip	Delta-One-TT Cup	8	57.5	0	0.00	0.00	6.41
Modulus Hip	Delta-PF Cup	66	909.4	3	0.33	0.07	0.96
Modulus Hip	Delta-TT Cup	49	315.6	1	0.32	0.00	1.77
Modulus Hip	Fitmore	4	68.1	0	0.00	0.00	5.42
Modulus Hip	RM Pressfit cup	5	34.6	0	0.00	0.00	10.67
Modulus Hip	Trabecular Metal Rev shell	2	19.3	0	0.00	0.00	19.16
Modulus Hip	Trabecular Metal Shell	2	18.5	0	0.00	0.00	19.91
Modulus Hip	Trident	3	16.1	0	0.00	0.00	22.97
MRS straight cemented stem	Trident All Poly	1	0.2	0	0.00	0.00	1480.62
MRS straight cemented stem	Trilogy	1	0.1	0	0.00	0.00	4491.21
MS 30	Allofit	48	535.5	3	0.56	0.12	1.64
MS 30	Artek	2	9.1	0	0.00	0.00	40.69
MS 30	Avantage cemented	42	90.6	1	1.10	0.03	6.15
MS 30	CCB	2	16.1	0	0.00	0.00	22.91
MS 30	CLS Expansion	28	343.0	0	0.00	0.00	1.08
MS 30	Contemporary	128	1321.8	12	0.91	0.47	1.59
MS 30	Continuum TM	477	2799.5	8	0.29	0.12	0.56
MS 30	Custom device	2	12.3	1	8.10	0.21	45.12
MS 30	Delta-PF Cup	1	10.1	0	0.00	0.00	36.35
MS 30	Duraloc	161	2675.5	20	0.75	0.46	1.15

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
MS 30	Durasul	43	199.1	1	0.50	0.01	2.80
MS 30	Durom	1	0.7	1	141.02	3.57	785.73
MS 30	Exeter	2	13.6	0	0.00	0.00	27.18
MS 30	Exeter X3	1	4.1	0	0.00	0.00	90.98
MS 30	Fitek	16	336.2	1	0.30	0.01	1.66
MS 30	Fitmore	3,019	25460.8	80	0.31	0.25	0.39
MS 30	G7 acetabular	181	215.2	3	1.39	0.29	4.07
MS 30	G7 acetabular shell	84	29.4	0	0.00	0.00	12.55
MS 30	LOR cup	4	23.0	0	0.00	0.00	16.04
MS 30	Marathon cemented	16	88.5	0	0.00	0.00	4.17
MS 30	Metasul Low Profile Cup	1	18.2	0	0.00	0.00	20.32
MS 30	Monoblock Acetabular Cup	1	12.6	0	0.00	0.00	29.20
MS 30	Morscher	809	11249.9	69	0.61	0.47	0.77
MS 30	Muller PE cup	521	5351.1	17	0.32	0.19	0.51
MS 30	Osteolock	5	95.9	0	0.00	0.00	3.85
MS 30	Pinnacle	167	359.5	0	0.00	0.00	1.03
MS 30	Reflection cemented	6	44.8	1	2.23	0.06	12.42
MS 30	RM cup	1	13.6	0	0.00	0.00	27.08
MS 30	RM Pressfit cup	90	906.0	5	0.55	0.15	1.21
MS 30	Trabecular Metal Rev shell	2	2.1	0	0.00	0.00	173.18
MS 30	Trabecular Metal Shell	38	234.7	2	0.85	0.10	3.08
MS 30	Trident	13	123.8	1	0.81	0.00	4.50
MS 30	Trilogy	419	3081.4	7	0.23	0.08	0.45
MS 30	Weber	2	5.6	1	17.94	0.45	99.95
MS 30	Weill ring	6	107.0	1	0.93	0.02	5.21
MS 30	ZCA	34	255.1	1	0.39	0.01	2.18
MS 30	ZCA all-poly cup	96	701.9	1	0.14	0.00	0.79
Multilock hip prosthesis	HGP 2 acetabular comp.	2	8.5	2	23.56	2.85	85.12
Multilock hip prosthesis	Trilogy	2	45.6	0	0.00	0.00	8.09
Nanos	R3 porous	2	7.3	1	13.70	0.35	76.33
Omnifit	Acetabular shell	7	121.7	3	2.47	0.51	7.21
Omnifit	Contemporary	15	141.9	1	0.70	0.02	3.93
Omnifit	Exeter	2	31.0	2	6.45	0.78	23.30
Omnifit	Polyethylene Acetabular cup	27	431.9	2	0.46	0.06	1.67
Omnifit	Screwless Acetabular Shell	14	233.8	3	1.28	0.26	3.75
Omnifit	Trident	164	2386.4	15	0.63	0.35	1.04
Omnifit M-HA Hip Stem	Trident	1	17.5	0	0.00	0.00	21.13



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Opti-Fix Fem component	Reflection porous	3	54.0	0	0.00	0.00	6.83
Optimys	CCB	3	9.9	0	0.00	0.00	37.32
Optimys	Continuum TM	2	12.0	0	0.00	0.00	30.77
Optimys	RM Pressfit cup	433	870.9	5	0.57	0.16	1.26
Orthopaedic salvage system	Avantage cemented	1	1.2	0	0.00	0.00	318.53
Pantheon cemented	Fixa Duplex	2	3.6	0	0.00	0.00	103.80
Pantheon cemented	Moonstone	1	1.2	0	0.00	0.00	304.15
Pantheon Salvage Cem Stem	Fixa Duplex	2	0.4	0	0.00	0.00	922.85
Pantheon Salvage Cem Stem	Multipolar Bipolar cup Stem	1	0.2	0	0.00	0.00	2283.67
Parva	Agilis Ti-por	1	7.2	0	0.00	0.00	51.29
Perfecta stem	Interseal acet shell quadrant	1	0.7	1	145.52	3.68	810.77
PFM distal	Artek	1	20.2	0	0.00	0.00	18.29
PFM distal	CLS Expansion	5	77.5	0	0.00	0.00	4.76
PFM distal	Contemporary	1	9.8	0	0.00	0.00	37.47
PFM distal	Duraloc	3	52.8	0	0.00	0.00	6.98
PFM distal	Exeter	1	1.4	0	0.00	0.00	270.55
PFM distal	Fitmore	2	0.1	2	2282.81	276.46	8246.30
PFM distal	Morscher	3	38.9	0	0.00	0.00	9.48
PFM distal	Muller PE cup	2	10.1	0	0.00	0.00	36.59
PFM distal	Reflection cemented	1	7.8	0	0.00	0.00	47.43
PFM distal	RM cup	2	33.0	0	0.00	0.00	11.17
PFM distal	SPH Revision Bicom.	2	1.4	0	0.00	0.00	258.12
PFM distal	Weber	2	0.4	1	222.71	5.64	1240.88
Platform	BHR Acetabular Cup	8	100.1	3	3.00	0.62	8.76
PLS	Delta-PF Cup	1	0.8	0	0.00	0.00	446.15
PLS	Delta-TT Cup	51	245.5	1	0.41	0.01	2.27
PLS	RM Pressfit cup	7	38.3	0	0.00	0.00	9.62
Polarstem uncemented	BHR Acetabular Cup	11	106.8	2	1.87	0.23	6.77
Polarstem uncemented	Contemporary	3	20.1	0	0.00	0.00	18.40
Polarstem uncemented	Continuum TM	3	20.2	0	0.00	0.00	18.31
Polarstem uncemented	Pinnacle	3	26.0	0	0.00	0.00	14.17
Polarstem uncemented	PolarCup cemented	5	9.4	0	0.00	0.00	39.09
Polarstem uncemented	PolarCup uncemented	32	156.7	4	2.55	0.70	6.54
Polarstem uncemented	R3 liner	2	0.6	0	0.00	0.00	570.92
Polarstem uncemented	R3 porous	2,223	9870.7	50	0.51	0.38	0.67
Polarstem uncemented	Reflection cemented	9	59.6	0	0.00	0.00	6.19
Polarstem uncemented	Reflection porous	335	2858.6	16	0.56	0.31	0.89
Polarstem uncemented	RM Pressfit cup	183	301.1	1	0.33	0.01	1.85

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Polarstem uncemented	Trabecular Metal Rev shell	1	3.0	1	32.99	0.84	183.83
Polarstem uncemented	Trident II Tritanium	7	9.0	0	0.00	0.00	41.13
Polarstem uncemented	Tritanium	6	14.7	0	0.00	0.00	25.08
Porous coated prox fem body	Contemporary	1	3.8	0	0.00	0.00	97.14
Porous coated prox fem body	Trident	1	3.6	0	0.00	0.00	103.40
Prodigy	Duraloc	143	2070.7	36	1.74	1.20	2.38
Prodigy	Pinnacle	36	525.5	6	1.14	0.42	2.48
Profemur	Conserve Plus	2	26.3	0	0.00	0.00	14.05
Profemur	Procotyl Acetabular	30	333.0	2	0.60	0.07	2.17
Proxima	ASR	1	14.9	0	0.00	0.00	24.80
Proxima	Pinnacle	6	80.5	1	1.24	0.03	6.92
Proximal femoral porous	Reflection cemented	1	4.6	0	0.00	0.00	80.78
Quadra-C	Acetabular Shell	240	337.7	3	0.89	0.18	2.60
Quadra-C	Contemporary	1	2.1	0	0.00	0.00	174.30
Quadra-C	Exeter X3	8	16.6	0	0.00	0.00	22.16
Quadra-C	Trident II Tritanium	3	1.2	0	0.00	0.00	314.07
Quadra-C	Trinity	1	1.5	0	0.00	0.00	245.42
Quadra-H	Acetabular Shell	345	438.9	9	2.05	0.94	3.89
Quadra-H	Exeter X3	1	2.6	0	0.00	0.00	143.34
Quadra-H	Mpact	1	1.5	0	0.00	0.00	239.74
Quadra-H	Pinnacle	1	0.4	0	0.00	0.00	863.69
Quadra-P	Acetabular Shell	41	35.1	1	2.85	0.00	15.86
Reclaim	Pinnacle	12	46.1	1	2.17	0.05	12.08
Redapt	Continuum TM	1	1.5	0	0.00	0.00	248.59
Redapt	RM Pressfit cup	1	1.6	0	0.00	0.00	227.98
Reef	CCB	1	0.1	0	0.00	0.00	5389.45
Reef	Elite Plus LPW	1	5.7	0	0.00	0.00	64.47
Reef	Muller PE cup	1	1.2	0	0.00	0.00	309.74
Reef	Pinnacle	1	2.1	0	0.00	0.00	179.65
Reef	PolarCup cemented	1	3.3	0	0.00	0.00	113.03
Reef	RM cup	2	4.2	0	0.00	0.00	88.12
Replica	Biomex acet shell porous	1	21.7	0	0.00	0.00	16.97
Replica	Duraloc	1	22.1	0	0.00	0.00	16.66
Replica	Pinnacle	1	13.1	1	7.66	0.19	42.66
Restoration	Contemporary	3	16.4	0	0.00	0.00	22.53
Restoration	Pinnacle	4	10.2	0	0.00	0.00	36.10
Restoration	Selexys TPS	1	1.5	0	0.00	0.00	243.21
Restoration	Trabecular Metal Shell	3	11.3	2	17.67	2.14	63.83



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Restoration	Trident	13	87.1	0	0.00	0.00	4.24
Restoration	Trident tritanium	5	13.6	0	0.00	0.00	27.19
Restoration	Trilogy	1	13.9	0	0.00	0.00	26.47
Restoration	Tritanium	10	48.7	0	0.00	0.00	7.58
Restoration	ZCA all-poly cup	1	2.8	0	0.00	0.00	131.84
Restoration Modular	Pinnacle	1	1.6	0	0.00	0.00	233.51
Restoration Modular	Trabecular Metal Shell	1	2.7	0	0.00	0.00	138.19
Restoration Modular	Trident	11	48.1	0	0.00	0.00	7.68
Restoration Modular	Trident II Tritanium	7	6.3	0	0.00	0.00	58.15
Restoration Modular	Trident tritanium	4	15.7	0	0.00	0.00	23.56
Restoration Modular	Tritanium	7	15.1	0	0.00	0.00	24.43
Revision Hip Stem	Delta-TT Cup	3	1.6	0	0.00	0.00	237.63
Revision uncemented stem	Contemporary	1	15.9	0	0.00	0.00	23.15
Revision uncemented stem	Continuum TM	2	13.3	0	0.00	0.00	27.70
Revision uncemented stem	Delta Revision TT Cup	1	1.3	0	0.00	0.00	294.83
Revision uncemented stem	Delta-PF Cup	5	59.6	1	1.68	0.04	9.35
Revision uncemented stem	Delta-TT Cup	7	25.7	0	0.00	0.00	14.38
Revision uncemented stem	Exeter X3	2	5.9	0	0.00	0.00	62.67
Revision uncemented stem	Pinnacle	2	26.3	0	0.00	0.00	14.03
Revision uncemented stem	RM Pressfit cup	2	13.4	0	0.00	0.00	27.44
Revision uncemented stem	SPH Acetabular cup	2	32.7	0	0.00	0.00	11.27
Revision uncemented stem	Trabecular Metal Shell	2	26.7	0	0.00	0.00	13.80
Revision uncemented stem	Trident	4	10.5	2	19.01	2.30	68.68
Revitan	CLS Expansion	2	30.5	0	0.00	0.00	12.08
Revitan	Continuum TM	3	22.5	0	0.00	0.00	16.37
Revitan	Fitmore	3	19.2	0	0.00	0.00	19.20
Revitan	Reflection cemented	1	4.1	0	0.00	0.00	90.61
Revitan	RM cup	2	27.7	0	0.00	0.00	13.33
Revitan	Trabecular Metal Shell	2	16.1	0	0.00	0.00	22.86
Revitan	Weber	1	14.7	0	0.00	0.00	25.16
Revitan	ZCA	1	8.2	0	0.00	0.00	44.91
RT Solution Bowed	Duraloc	1	4.3	0	0.00	0.00	86.59
S-Rom	Allofit	1	13.2	0	0.00	0.00	28.01
S-Rom	ASR	130	897.9	96	10.69	8.61	12.99
S-Rom	Continuum TM	20	130.6	0	0.00	0.00	2.82
S-Rom	Delta-TT Cup	2	25.2	0	0.00	0.00	14.66
S-Rom	DeltaMotion Cup	1	9.4	0	0.00	0.00	39.09
S-Rom	Duraloc	56	966.2	7	0.72	0.29	1.49
S-Rom	Fitmore	2	26.5	0	0.00	0.00	13.94
S-Rom	G7 acetabular	5	17.7	0	0.00	0.00	20.79

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
S-Rom	G7 acetabular shell	3	0.1	0	0.00	0.00	2495.12
S-Rom	Morscher	2	35.3	1	2.83	0.07	15.78
S-Rom	Muller PE cup	1	12.8	0	0.00	0.00	28.81
S-Rom	Osteolock	10	124.5	6	4.82	1.77	10.49
S-Rom	Pinnacle	401	4617.7	40	0.87	0.61	1.17
S-Rom	R3 porous	3	18.4	0	0.00	0.00	20.00
S-Rom	Reflection cemented	4	79.4	1	1.26	0.03	7.02
S-Rom	Reflection porous	10	187.5	0	0.00	0.00	1.97
S-Rom	RM Pressfit cup	2	10.4	0	0.00	0.00	35.48
S-Rom	Trabecular Metal Rev shell	2	8.6	0	0.00	0.00	43.09
S-Rom	Trabecular Metal Shell	17	145.4	1	0.69	0.02	3.83
S-Rom	Trident	7	83.2	0	0.00	0.00	4.43
S-Rom	Trident II Titanium	1	1.8	0	0.00	0.00	206.65
S-Rom	Trilogy	21	281.8	6	2.13	0.78	4.63
S-Rom	Ultima	78	1433.8	14	0.98	0.53	1.64
S-Rom	Vitalock	1	22.7	0	0.00	0.00	16.28
S-Rom Femoral Stem	Pinnacle	2	0.2	0	0.00	0.00	1772.85
Secur-Fit	Osteolock	5	102.6	0	0.00	0.00	3.60
Secur-Fit	Trident	15	252.8	0	0.00	0.00	1.46
Secur-Fit Max	Delta-TT Cup	1	9.7	0	0.00	0.00	38.15
Secur-Fit Max	Trident	14	119.0	2	1.68	0.20	6.07
Secur-Fit Max	Titanium	34	321.6	2	0.62	0.08	2.25
Silent	Fitmore	5	46.2	0	0.00	0.00	7.99
Silent	Pinnacle	5	54.7	0	0.00	0.00	6.74
SL modular stem	Contemporary	4	38.7	1	2.58	0.07	14.40
SL modular stem	Duraloc	54	816.8	10	1.22	0.59	2.25
SL modular stem	Fitek	2	45.9	0	0.00	0.00	8.04
SL modular stem	Morscher	1	23.4	0	0.00	0.00	15.79
SL modular stem	Muller PE cup	110	1520.7	3	0.20	0.04	0.58
SL modular stem	RM cup	322	5010.1	42	0.84	0.60	1.13
SL monoblock	CCB	1	9.7	0	0.00	0.00	37.84
SL monoblock	Duraloc	41	579.0	5	0.86	0.28	2.02
SL monoblock	Fitek	2	3.5	0	0.00	0.00	106.76
SL monoblock	Morscher	1	22.4	0	0.00	0.00	16.50
SL monoblock	Muller PE cup	560	6771.2	31	0.46	0.31	0.65
SL monoblock	RM cup	43	426.7	1	0.23	0.01	1.31
SL monoblock	SPH Acetabular cup	1	4.2	0	0.00	0.00	88.58
SL monoblock	Weber	9	121.4	0	0.00	0.00	3.04
SL-Plus	EP-Fit Plus	5	57.4	1	1.74	0.04	9.71
Solution	Duraloc	5	40.8	0	0.00	0.00	9.05



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Solution	Reflection cemented	1	8.8	0	0.00	0.00	41.70
Solution	RM Pressfit cup	1	13.3	0	0.00	0.00	27.68
Solution	Trabecular Metal Shell	1	0.9	0	0.00	0.00	401.00
Solution Bow	Duraloc	1	0.5	0	0.00	0.00	752.72
Solution Bow	Elite Plus LPW	2	21.1	1	4.73	0.12	26.36
Solution Bow	Muller PE cup	2	3.8	0	0.00	0.00	97.71
Solution Bow	Pinnacle	1	3.3	0	0.00	0.00	111.91
Solution Bow	Reflection cemented	2	5.0	0	0.00	0.00	73.71
Solution Bow	Reflection porous	3	1.3	0	0.00	0.00	284.25
Solution Bow	Ultima	1	4.9	0	0.00	0.00	76.04
Solution Rev Stem	Reflection porous	1	11.2	0	0.00	0.00	33.02
Spectron	Acetabular Reconstruction Ring	2	41.1	0	0.00	0.00	8.98
Spectron	BHR Acetabular Cup	34	336.8	8	2.38	1.03	4.68
Spectron	Biomex acet shell porous	194	3239.0	15	0.46	0.25	0.74
Spectron	CCB	4	53.9	0	0.00	0.00	6.84
Spectron	CCE Acet . Roof Reinforce Ring	1	7.2	1	13.85	0.35	77.14
Spectron	Charnley	1	18.1	0	0.00	0.00	20.37
Spectron	CLS Expansion	4	44.9	0	0.00	0.00	8.22
Spectron	Contemporary	2	8.9	0	0.00	0.00	41.36
Spectron	Continuum TM	3	12.3	0	0.00	0.00	30.08
Spectron	Delta-PF Cup	1	14.1	0	0.00	0.00	26.20
Spectron	Delta-TT Cup	3	22.4	0	0.00	0.00	16.49
Spectron	DeltaMotion Cup	1	10.6	0	0.00	0.00	34.73
Spectron	Duraloc	1,570	20927.1	296	1.41	1.26	1.59
Spectron	Exceed ABT Ringloc-X	12	115.3	0	0.00	0.00	3.20
Spectron	Exeter	4	29.7	0	0.00	0.00	12.41
Spectron	Fitek	6	129.2	1	0.77	0.02	4.31
Spectron	Fitmore	120	1657.9	8	0.48	0.21	0.95
Spectron	Mallory-Head	255	3592.5	12	0.33	0.17	0.58
Spectron	Monoblock Acetabular Cup	1	1.3	0	0.00	0.00	273.30
Spectron	Morscher	211	3057.1	34	1.11	0.77	1.55
Spectron	Muller PE cup	67	695.0	8	1.15	0.50	2.27
Spectron	Opera Cup	1	17.0	0	0.00	0.00	21.71
Spectron	Osteolock	19	301.2	6	1.99	0.73	4.34
Spectron	Pinnacle	11	93.2	0	0.00	0.00	3.96
Spectron	PolarCup cemented	4	7.6	0	0.00	0.00	48.28
Spectron	PolarCup uncemented	11	48.2	0	0.00	0.00	7.66
Spectron	R3 porous	451	3458.6	12	0.35	0.17	0.59

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Spectron	Recovery Protrusio Cage	1	0.2	0	0.00	0.00	2072.87
Spectron	Reflection cemented	2,984	31820.7	380	1.19	1.08	1.32
Spectron	Reflection porous	3,350	40631.9	373	0.92	0.83	1.01
Spectron	RM cup	39	375.6	4	1.07	0.29	2.73
Spectron	RM Pressfit cup	25	248.8	1	0.40	0.01	2.24
Spectron	Selexys TPS	1	8.4	0	0.00	0.00	43.67
Spectron	Spectron	19	112.9	2	1.77	0.21	6.40
Spectron	Trabecular Metal Shell	14	81.1	0	0.00	0.00	4.55
Spectron	Trident	104	1368.9	6	0.44	0.16	0.95
Spectron	Trilogy	36	357.6	8	2.24	0.97	4.41
Spectron	Vitalock	3	53.3	3	5.62	1.16	16.44
Spectron	Weber	18	188.3	0	0.00	0.00	1.96
Spectron	Weill ring	2	45.0	0	0.00	0.00	8.19
Standard stem uncemented	Acetabular Shell	5	0.7	0	0.00	0.00	506.53
Standard straight stem	Allofit	1	15.8	0	0.00	0.00	23.41
Standard straight stem	Avantage	1	0.1	0	0.00	0.00	5614.01
Standard straight stem	Avantage cemented	5	9.9	0	0.00	0.00	37.27
Standard straight stem	CCB	1	8.4	0	0.00	0.00	43.87
Standard straight stem	CLS Expansion	36	419.6	5	1.19	0.39	2.78
Standard straight stem	Contemporary	5	46.9	0	0.00	0.00	7.87
Standard straight stem	Continuum TM	49	403.7	1	0.25	0.00	1.38
Standard straight stem	Delta-TT Cup	8	73.7	0	0.00	0.00	5.00
Standard straight stem	Duraloc	8	136.1	3	2.20	0.45	6.44
Standard straight stem	Durasul	47	171.3	1	0.58	0.01	3.25
Standard straight stem	Fitek	1	21.9	0	0.00	0.00	16.88
Standard straight stem	Fitmore	35	363.9	2	0.55	0.07	1.99
Standard straight stem	G7 acetabular shell	1	0.5	0	0.00	0.00	752.72
Standard straight stem	M2A	1	5.8	0	0.00	0.00	63.61
Standard straight stem	Marathon cemented	3	19.5	0	0.00	0.00	18.94
Standard straight stem	Morscher	36	485.3	1	0.21	0.01	1.15
Standard straight stem	Muller PE cup	638	6311.1	23	0.36	0.23	0.55
Standard straight stem	Osteolock	2	30.0	0	0.00	0.00	12.30
Standard straight stem	Pinnacle	1	10.2	0	0.00	0.00	36.08
Standard straight stem	Reflection cemented	1	10.6	0	0.00	0.00	34.65
Standard straight stem	RM cup	138	1742.6	13	0.75	0.40	1.28
Standard straight stem	RM Pressfit cup	137	1293.8	1	0.08	0.00	0.43
Standard straight stem	SPH Acetabular cup	3	32.3	1	3.10	0.08	17.26
Standard straight stem	Stanmore	1	6.6	0	0.00	0.00	56.19
Standard straight stem	Trident	42	564.4	6	1.06	0.39	2.31



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Standard straight stem	Trilogy	47	502.9	7	1.39	0.56	2.87
Standard straight stem	Weber	134	1392.7	4	0.29	0.08	0.74
Standard straight stem	ZCA	41	368.2	1	0.27	0.00	1.51
Standard straight stem	ZCA all-poly cup	50	396.9	1	0.25	0.00	1.40
Stanmore	Stanmore	36	385.3	2	0.52	0.06	1.88
Std Femoral Stem	Acetabular Shell	5	0.5	0	0.00	0.00	811.66
Stellaris	Pinnacle	3	22.1	0	0.00	0.00	16.71
Stellaris	RM Pressfit cup	1	7.7	0	0.00	0.00	47.85
Stellaris	Selexys TPS	7	67.6	0	0.00	0.00	5.46
Stellaris	Trilogy	1	9.3	0	0.00	0.00	39.80
Stemsys	Agilis Ti-por	545	2977.5	20	0.67	0.41	1.04
Stemsys	Agilis Ti-Por	1	7.1	0	0.00	0.00	52.22
Stemsys	Custom device	1	7.0	0	0.00	0.00	52.41
Stemsys	Delta-PF Cup	606	2547.6	10	0.39	0.17	0.70
Stemsys	Delta-TT Cup	18	72.1	0	0.00	0.00	5.12
Stemsys	DeltaMotion Cup	541	3950.5	8	0.20	0.09	0.40
Stemsys	Fixa Ti Por	933	5093.9	21	0.41	0.25	0.62
Stemsys	Freeliner	1	0.1	0	0.00	0.00	3641.52
Stemsys	Maxera Cup	86	98.0	0	0.00	0.00	3.76
Stemsys	Pinnacle	5	24.0	0	0.00	0.00	15.34
Stemsys	Polymax	182	689.9	4	0.58	0.16	1.48
Stemsys	Reflection cemented	1	2.4	0	0.00	0.00	154.51
Stemsys	RM Pressfit cup	390	2112.3	7	0.33	0.13	0.68
Stemsys	Zimmer Maxera Cup	47	40.2	0	0.00	0.00	9.18
Stemsys cemented	Agilis Ti-por	1	7.2	0	0.00	0.00	51.02
Stemsys cemented	BIS Dual Mobility	1	1.0	0	0.00	0.00	360.26
Stemsys cemented	Delta-PF Cup	91	357.6	0	0.00	0.00	1.03
Stemsys cemented	Delta-TT Cup	3	10.0	0	0.00	0.00	36.82
Stemsys cemented	Elevated Rim Cemented	1	2.0	0	0.00	0.00	188.18
Stemsys cemented	Fixa Duplex	2	2.2	0	0.00	0.00	164.71
Stemsys cemented	Fixa Ti Por	6	22.1	0	0.00	0.00	16.71
Stemsys cemented	Polymax	29	88.7	0	0.00	0.00	4.16
Stemsys cemented	RM Pressfit cup	82	338.2	0	0.00	0.00	1.09
Stemsys Cemented	Delta-PF Cup	4	0.4	0	0.00	0.00	969.33
Stemsys Cemented	Polymax	1	0.2	0	0.00	0.00	1705.52
Stemsys HAC	Delta-PF Cup	1	0.3	0	0.00	0.00	1171.62
Stemsys HAC	Fixa Ti Por	1	0.2	0	0.00	0.00	1585.13
Stemsys HAC	Maxera Cup	1	0.3	0	0.00	0.00	1320.94
Stemsys HAC	Zimmer Maxera Cup	1	0.0	0	0.00	0.00	7925.67
Summit	ASR	88	873.0	38	4.35	3.08	5.97

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Summit	Charnley	1	14.1	0	0.00	0.00	26.21
Summit	Continuum TM	21	170.6	1	0.59	0.01	3.27
Summit	Duraloc	106	1503.6	6	0.40	0.15	0.87
Summit	Elite Plus LPW	1	18.8	0	0.00	0.00	19.64
Summit	Elite Plus Ogee	6	62.6	1	1.60	0.04	8.90
Summit	Marathon cemented	5	57.0	0	0.00	0.00	6.47
Summit	Monoblock Acetabular Cup	22	331.6	0	0.00	0.00	1.11
Summit	Pinnacle	2,744	20185.5	121	0.60	0.50	0.72
Summit	Trabecular Metal Shell	1	10.5	0	0.00	0.00	35.12
Summit	Trilogy	194	1748.2	7	0.40	0.16	0.83
Summit	Tritanium	2	6.1	0	0.00	0.00	60.10
Summit	ZCA	1	4.1	1	24.32	0.62	135.49
Synergy Porous	BHR Acetabular Cup	114	1222.6	42	3.44	2.48	4.64
Synergy Porous	BHR dysplasia cup	1	6.8	1	14.79	0.37	82.39
Synergy Porous	Continuum TM	55	285.5	0	0.00	0.00	1.29
Synergy Porous	Delta-PF Cup	118	1061.5	2	0.19	0.02	0.68
Synergy Porous	Delta-TT Cup	15	143.6	1	0.70	0.02	3.88
Synergy Porous	Duraloc	22	389.7	3	0.77	0.16	2.25
Synergy Porous	EP-Fit Plus	1	9.5	0	0.00	0.00	38.81
Synergy Porous	Exceed ABT Acetabular Porous	8	115.4	0	0.00	0.00	3.20
Synergy Porous	Fitmore	1	16.2	0	0.00	0.00	22.74
Synergy Porous	G7 acetabular	36	74.4	0	0.00	0.00	4.96
Synergy Porous	G7 acetabular shell	8	2.0	0	0.00	0.00	187.92
Synergy Porous	M2A	1	17.3	0	0.00	0.00	21.35
Synergy Porous	Morscher	12	195.5	2	1.02	0.12	3.70
Synergy Porous	PolarCup uncemented	1	8.8	0	0.00	0.00	42.01
Synergy Porous	R3 porous	1,853	12848.3	64	0.50	0.38	0.64
Synergy Porous	Reflection cemented	5	46.4	1	2.16	0.05	12.02
Synergy Porous	Reflection porous	1,363	16683.8	54	0.32	0.24	0.42
Synergy Porous	RM Pressfit cup	44	194.2	1	0.51	0.01	2.87
Synergy Porous	Trabecular Metal Shell	11	65.0	1	1.54	0.04	8.58
Synergy Porous	Trident	15	67.5	0	0.00	0.00	5.47
Synergy Porous Femoral comp.	G7 acetabular shell	1	0.3	0	0.00	0.00	1236.11
Synergy Porous Femoral comp.	R3 porous	1	0.5	0	0.00	0.00	701.75
Taperfit	Trinity	2	9.5	0	0.00	0.00	38.77
Taperloc Complete	Acetabular Shell	5	5.7	0	0.00	0.00	64.50
Taperloc Complete	Avantage cemented	1	1.8	0	0.00	0.00	204.15
Taperloc Complete	Continuum TM	277	698.4	7	1.00	0.40	2.06



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Taperloc Complete	Custom device	1	0.2	0	0.00	0.00	1981.42
Taperloc Complete	Delta-One-TT Cup	5	6.6	0	0.00	0.00	55.75
Taperloc Complete	Delta-PF Cup	3	8.1	0	0.00	0.00	45.34
Taperloc Complete	Delta-TT Cup	144	323.1	0	0.00	0.00	1.14
Taperloc Complete	Fitmore	12	54.0	2	3.71	0.45	13.39
Taperloc Complete	G7 acetabular	503	1478.9	9	0.61	0.28	1.16
Taperloc Complete	G7 acetabular shell	83	25.8	0	0.00	0.00	14.28
Taperloc Complete	G7 Osseo Ti Multihole	2	0.7	0	0.00	0.00	506.53
Taperloc Complete	Mallory-Head	2	17.8	0	0.00	0.00	20.72
Taperloc Complete	Pinnacle	1	0.1	0	0.00	0.00	4346.33
Taperloc Complete	RM Pressfit cup	375	1088.7	6	0.55	0.20	1.20
Taperloc Complete	Trabecular Metal Shell	1	6.3	0	0.00	0.00	58.23
Taperloc Complete	Trident	119	119.7	1	0.84	0.02	4.66
Taperloc Complete	Trilogy	1	5.1	0	0.00	0.00	71.67
Taperloc Complete	ZCA all-poly cup	3	2.9	0	0.00	0.00	129.31
Taperloc Complete Micro	G7 acetabular shell	3	0.3	0	0.00	0.00	1347.36
Thira	Delta-PF Cup	1	16.3	0	0.00	0.00	22.66
Thira	Mueller Cup	1	1.5	0	0.00	0.00	246.32
TPP Thrust Plate	CLS Expansion	3	62.6	0	0.00	0.00	5.89
TPP Thrust Plate	Contemporary	1	14.6	0	0.00	0.00	25.20
TPP Thrust Plate	Fitmore	68	1092.2	16	1.46	0.84	2.38
Trabecular Metal Stem	Contemporary	3	23.3	0	0.00	0.00	15.86
Trabecular Metal Stem	Continuum TM	503	3464.8	18	0.52	0.31	0.82
Trabecular Metal Stem	Custom device	1	3.7	0	0.00	0.00	100.03
Trabecular Metal Stem	Duraloc	13	141.3	1	0.71	0.00	3.94
Trabecular Metal Stem	Durom	2	17.1	1	5.83	0.15	32.49
Trabecular Metal Stem	Fitmore	1	14.9	0	0.00	0.00	24.70
Trabecular Metal Stem	Monoblock Acetabular Cup	74	1025.6	3	0.29	0.06	0.85
Trabecular Metal Stem	Pinnacle	5	44.9	0	0.00	0.00	8.21
Trabecular Metal Stem	R3 porous	1	12.3	0	0.00	0.00	30.11
Trabecular Metal Stem	Reflection cemented	1	12.3	0	0.00	0.00	30.03
Trabecular Metal Stem	RM Pressfit cup	1	15.1	0	0.00	0.00	24.38
Trabecular Metal Stem	Stanmore	1	13.3	0	0.00	0.00	27.75
Trabecular Metal Stem	Trabecular Metal Shell	41	493.8	2	0.41	0.02	1.46
Trabecular Metal Stem	Trilogy	20	228.0	0	0.00	0.00	1.62
Tri-Lock BPS	DeltaMotion Cup	15	157.9	0	0.00	0.00	2.34
Tri-Lock BPS	Fitmore	1	10.8	0	0.00	0.00	34.09
Tri-Lock BPS	Pinnacle	129	648.0	3	0.46	0.10	1.35
Tri-Lock BPS	Trident	6	10.7	0	0.00	0.00	34.46
Tri-Lock BPS	Trilogy	1	10.3	0	0.00	0.00	35.67

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
TwinSys cemented	CCB	460	2996.5	22	0.73	0.46	1.11
TwinSys cemented	CLS Expansion	1	11.5	0	0.00	0.00	32.06
TwinSys cemented	Contemporary	9	75.9	1	1.32	0.03	7.34
TwinSys cemented	Continuum TM	152	760.6	4	0.53	0.14	1.35
TwinSys cemented	Custom device	1	4.5	0	0.00	0.00	82.31
TwinSys cemented	Delta Revision TT Cup	3	10.0	0	0.00	0.00	37.01
TwinSys cemented	Delta-One-TT Cup	1	3.8	0	0.00	0.00	96.03
TwinSys cemented	Delta-PF Cup	21	137.1	0	0.00	0.00	2.69
TwinSys cemented	Delta-TT Cup	17	73.3	1	1.36	0.03	7.60
TwinSys cemented	DeltaMotion Cup	2	15.2	0	0.00	0.00	24.30
TwinSys cemented	DS Evolution	6	6.2	0	0.00	0.00	59.20
TwinSys cemented	Duraloc	1	2.0	0	0.00	0.00	187.92
TwinSys cemented	Expansys shell	2	6.6	0	0.00	0.00	55.75
TwinSys cemented	G7 acetabular	1	0.6	0	0.00	0.00	620.90
TwinSys cemented	Logical TM	1	3.3	0	0.00	0.00	110.53
TwinSys cemented	Morscher	9	98.8	2	2.02	0.25	7.31
TwinSys cemented	Muller PE cup	10	71.9	0	0.00	0.00	5.13
TwinSys cemented	Pinnacle	143	569.6	10	1.76	0.84	3.23
TwinSys cemented	Polymax	3	1.6	0	0.00	0.00	226.45
TwinSys cemented	R3 porous	1	6.8	0	0.00	0.00	54.35
TwinSys cemented	Redapt	1	0.2	0	0.00	0.00	1981.42
TwinSys cemented	Reflection cemented	2	13.5	0	0.00	0.00	27.41
TwinSys cemented	Reflection porous	73	388.2	0	0.00	0.00	0.95
TwinSys cemented	RM cup	148	1753.8	6	0.34	0.13	0.74
TwinSys cemented	RM Pressfit cup	2,346	13601.8	55	0.40	0.30	0.52
TwinSys cemented	Selexys TPS	65	592.4	6	1.01	0.37	2.20
TwinSys cemented	Trabecular Metal Rev shell	1	3.1	0	0.00	0.00	119.24
TwinSys cemented	Trabecular Metal Shell	5	11.6	1	8.62	0.22	48.05
TwinSys cemented	Trident	8	27.5	1	3.63	0.09	20.24
TwinSys cemented	Trident II Tritanium	5	3.8	0	0.00	0.00	98.13
TwinSys cemented	Triflanged Acetabulum	1	1.5	0	0.00	0.00	245.87
TwinSys cemented	Trilogy	4	36.8	0	0.00	0.00	10.04
TwinSys cemented	Trinity	1	2.7	0	0.00	0.00	136.23
TwinSys cemented	Tritanium	1	7.4	0	0.00	0.00	50.18
TwinSys cemented	ZCA all-poly cup	1	9.5	0	0.00	0.00	39.00
Twinsys HA stem uncem	RM Pressfit cup	7	1.4	0	0.00	0.00	256.15
TwinSys stem cemented	CCB	2	0.6	0	0.00	0.00	626.68
TwinSys stem cemented	Continuum TM	3	0.6	0	0.00	0.00	596.18
TwinSys stem cemented	Pinnacle	3	0.8	0	0.00	0.00	488.18
TwinSys stem cemented	RM Pressfit cup	16	4.0	0	0.00	0.00	91.22



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
TwinSys uncemented	Allofit	4	36.3	0	0.00	0.00	10.16
TwinSys uncemented	CCB	37	279.5	3	1.07	0.22	3.14
TwinSys uncemented	CLS Expansion	8	78.7	0	0.00	0.00	4.69
TwinSys uncemented	Continuum TM	138	1181.7	5	0.42	0.14	0.99
TwinSys uncemented	Delta-One-TT Cup	1	7.8	0	0.00	0.00	47.34
TwinSys uncemented	Delta-PF Cup	395	4061.4	4	0.10	0.03	0.25
TwinSys uncemented	Delta-TT Cup	29	284.2	2	0.70	0.09	2.54
TwinSys uncemented	DeltaMotion Cup	6	66.5	0	0.00	0.00	5.55
TwinSys uncemented	Duraloc	13	155.4	2	1.29	0.07	4.65
TwinSys uncemented	EP-Fit Plus	2	24.3	0	0.00	0.00	15.19
TwinSys uncemented	Exeter	1	8.2	0	0.00	0.00	44.94
TwinSys uncemented	Expansys shell	8	89.1	0	0.00	0.00	4.14
TwinSys uncemented	Fitmore	12	96.5	0	0.00	0.00	3.82
TwinSys uncemented	Marathon cemented	3	31.4	0	0.00	0.00	11.74
TwinSys uncemented	Monoblock Acetabular Cup	5	40.4	0	0.00	0.00	9.14
TwinSys uncemented	Morscher	2	27.2	0	0.00	0.00	13.54
TwinSys uncemented	Muller PE cup	2	16.9	0	0.00	0.00	21.84
TwinSys uncemented	Pinnacle	43	330.3	1	0.30	0.01	1.69
TwinSys uncemented	PolarCup uncemented	13	61.6	1	1.62	0.04	9.05
TwinSys uncemented	R3 porous	14	116.6	0	0.00	0.00	3.16
TwinSys uncemented	Reflection cemented	2	21.4	0	0.00	0.00	17.27
TwinSys uncemented	Reflection porous	2	11.8	1	8.47	0.21	47.17
TwinSys uncemented	RM cup	122	1318.1	11	0.83	0.39	1.44
TwinSys uncemented	RM Pressfit cup	5,308	40912.9	241	0.59	0.52	0.67
TwinSys uncemented	RM Pressfit Cup Hooded	2	0.2	0	0.00	0.00	1871.34
TwinSys uncemented	Selexys TPS	1,231	13385.9	147	1.10	0.93	1.29
TwinSys uncemented	Trabecular Metal Shell	3	28.0	0	0.00	0.00	13.18
TwinSys uncemented	Trident	30	279.0	1	0.36	0.01	2.00
TwinSys uncemented	Trident II Tritanium	6	5.1	0	0.00	0.00	72.63
TwinSys uncemented	Trilogy	209	2318.2	12	0.52	0.27	0.90
TwinSys uncemented	Tritanium	11	114.0	1	0.88	0.02	4.89
Versys	Acetabular Reconstruction Ring	6	14.6	0	0.00	0.00	25.23
Versys	Charnley Cup Ogee	4	65.5	1	1.53	0.04	8.50
Versys	Contemporary	1	12.7	0	0.00	0.00	29.13
Versys	Continuum TM	1	7.7	0	0.00	0.00	47.71
Versys	Duraloc	9	124.0	1	0.81	0.02	4.49
Versys	Exeter	2	28.1	1	3.56	0.09	19.84
Versys	Fitmore	1	12.4	0	0.00	0.00	29.75

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Versys	Hedrocel Acetabular Cup	3	17.5	1	5.71	0.14	31.82
Versys	Monoblock Acetabular Cup	1	12.2	0	0.00	0.00	30.20
Versys	Muller PE cup	1	18.9	0	0.00	0.00	19.54
Versys	Multipolar Bipolar	2	11.3	0	0.00	0.00	32.66
Versys	Reflection cemented	2	2.8	2	71.83	8.70	259.47
Versys	Trabecular Metal Shell	8	140.1	0	0.00	0.00	2.63
Versys	Trident	5	100.0	0	0.00	0.00	3.69
Versys	Trilogy	453	7584.9	28	0.37	0.25	0.53
Versys	ZCA	3	38.0	0	0.00	0.00	9.70
Versys cemented	Charnley	2	6.8	0	0.00	0.00	54.09
Versys cemented	Charnley Cup Ogee	3	18.6	1	5.37	0.14	29.93
Versys cemented	Contemporary	7	44.7	0	0.00	0.00	8.25
Versys cemented	Continuum TM	2	22.5	0	0.00	0.00	16.42
Versys cemented	Duraloc	3	57.4	0	0.00	0.00	6.43
Versys cemented	Exeter	1	8.9	0	0.00	0.00	41.48
Versys cemented	Monoblock Acetabular Cup	2	29.9	0	0.00	0.00	12.33
Versys cemented	Muller PE cup	1	9.8	0	0.00	0.00	37.73
Versys cemented	Multipolar Bipolar	3	14.8	0	0.00	0.00	24.90
Versys cemented	Reflection cemented	3	12.8	0	0.00	0.00	28.85
Versys cemented	Reflection porous	2	15.3	0	0.00	0.00	24.17
Versys cemented	RM Pressfit cup	11	98.5	0	0.00	0.00	3.74
Versys cemented	Trabecular Metal Shell	6	55.0	0	0.00	0.00	6.70
Versys cemented	Trident	12	82.9	1	1.21	0.03	6.72
Versys cemented	Trilogy	558	6834.9	18	0.26	0.16	0.42
Versys cemented	Titanium	8	69.7	0	0.00	0.00	5.29
Versys cemented	ZCA	391	4548.4	32	0.70	0.48	0.99
Versys cemented	ZCA all-poly cup	31	256.8	0	0.00	0.00	1.44
Versys Revision Femoral Stem	Contemporary	6	12.0	1	8.33	0.21	46.43
Versys Revision Femoral Stem	Continuum TM	14	30.0	0	0.00	0.00	12.29
Versys Revision Femoral Stem	G7 acetabular	12	12.9	0	0.00	0.00	28.52
Versys Revision Femoral Stem	G7 Osseo Ti Multihole	2	0.8	0	0.00	0.00	491.74
Versys Revision Femoral Stem	Marathon cemented	4	7.1	0	0.00	0.00	51.92
Versys Revision Femoral Stem	Max-Ti acetabular reconstructi	1	1.0	0	0.00	0.00	381.69
Versys Revision Femoral Stem	Muller PE cup	1	11.7	0	0.00	0.00	31.41



Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Versys Revision Femoral Stem	Multipolar Bipolar	1	2.6	0	0.00	0.00	142.73
Versys Revision Femoral Stem	MUTARS	2	0.5	0	0.00	0.00	778.82
Versys Revision Femoral Stem	R3 porous	1	2.7	0	0.00	0.00	135.28
Versys Revision Femoral Stem	Reflection cemented	3	7.9	0	0.00	0.00	46.72
Versys Revision Femoral Stem	RM cup	1	0.1	0	0.00	0.00	2694.73
Versys Revision Femoral Stem	RM Pressfit cup	1	2.0	0	0.00	0.00	187.92
Versys Revision Femoral Stem	Trabecular Metal Shell	4	18.3	0	0.00	0.00	20.11
Versys Revision Femoral Stem	Trilogy	8	87.4	0	0.00	0.00	4.22
Versys Revision Femoral Stem	ZCA	11	13.7	0	0.00	0.00	26.95
Versys Revision Femoral Stem	ZCA all-poly cup	12	22.3	0	0.00	0.00	16.54
Wagner cone stem	Acetabular Revision	1	15.4	0	0.00	0.00	24.00
Wagner cone stem	Artek	10	111.0	5	4.50	1.46	10.51
Wagner cone stem	CLS Expansion	13	144.2	5	3.47	1.13	8.09
Wagner cone stem	Continuum TM	60	291.7	2	0.69	0.08	2.48
Wagner cone stem	DeltaMotion Cup	2	10.9	0	0.00	0.00	33.97
Wagner cone stem	Duraloc	27	333.8	18	5.39	3.20	8.52
Wagner cone stem	Durom	7	107.7	2	1.86	0.22	6.71
Wagner cone stem	Exeter	1	12.7	1	7.85	0.20	43.72
Wagner cone stem	Fitek	3	68.8	0	0.00	0.00	5.36
Wagner cone stem	Fitmore	79	1009.7	4	0.40	0.11	1.01
Wagner cone stem	G7 acetabular	6	7.3	0	0.00	0.00	50.81
Wagner cone stem	G7 acetabular shell	2	0.6	0	0.00	0.00	601.50
Wagner cone stem	Maxera Cup	1	1.6	0	0.00	0.00	228.37
Wagner cone stem	Metasul Low Profile Cup	1	19.4	0	0.00	0.00	19.04
Wagner cone stem	Morscher	35	636.3	4	0.63	0.17	1.61
Wagner cone stem	Muller PE cup	1	11.6	0	0.00	0.00	31.86
Wagner cone stem	Pinnacle	12	66.8	1	1.50	0.04	8.34
Wagner cone stem	Polymax	1	3.1	0	0.00	0.00	119.45
Wagner cone stem	Reflection cemented	1	8.3	0	0.00	0.00	44.32
Wagner cone stem	Reflection porous	5	23.8	0	0.00	0.00	15.50
Wagner cone stem	RM cup	4	47.5	3	6.32	1.30	18.47
Wagner cone stem	RM Pressfit cup	1	6.3	0	0.00	0.00	58.30
Wagner cone stem	Selexys TPS	1	12.6	0	0.00	0.00	29.23

Femur Prosthesis	Acetabular Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Wagner cone stem	Trabecular Metal Rev shell	1	13.7	0	0.00	0.00	26.98
Wagner cone stem	Trabecular Metal Shell	10	64.5	1	1.55	0.00	8.63
Wagner cone stem	Trident	8	116.5	0	0.00	0.00	3.17
Wagner cone stem	Trilogy	12	88.8	1	1.13	0.03	6.28
Wagner cone stem	Tritanium	1	6.2	0	0.00	0.00	59.33
Wagner cone stem	Weill ring	2	32.3	1	3.10	0.08	17.25
Wagner cone stem	Zimmer Maxera Cup	1	0.1	0	0.00	0.00	4210.51
Zimmer femoral component	Trident	1	1.9	0	0.00	0.00	197.27
Zimmer M/L Taper	Continuum TM	5	17.7	0	0.00	0.00	20.80
Zimmer M/L Taper	Trident	4	12.9	0	0.00	0.00	28.69
Zimmer Segmental	Avantage cemented	4	7.4	2	27.05	3.28	97.70
Zimmer Segmental	G7 acetabular	1	1.1	0	0.00	0.00	329.43
Zimmer Segmental	Multipolar Bipolar	1	0.4	0	0.00	0.00	826.60
Zimmer Sheehan fem stem	ZCA	1	22.9	0	0.00	0.00	16.11
ZMR Fem Stem Rev Nitrided	Allofit	2	24.0	1	4.17	0.11	23.24
ZMR Fem Stem Rev Nitrided	Avantage cemented	1	4.6	0	0.00	0.00	79.96
ZMR Fem Stem Rev Nitrided	Contemporary	2	5.9	0	0.00	0.00	62.67
ZMR Fem Stem Rev Nitrided	Continuum TM	5	35.1	0	0.00	0.00	10.50
ZMR Fem Stem Rev Nitrided	Duraloc	2	25.6	0	0.00	0.00	14.43
ZMR Fem Stem Rev Nitrided	G7 acetabular shell	3	2.3	0	0.00	0.00	159.26
ZMR Fem Stem Rev Nitrided	Multipolar Bipolar	1	6.5	0	0.00	0.00	57.00
ZMR Fem Stem Rev Nitrided	Pinnacle	1	10.3	0	0.00	0.00	35.76
ZMR Fem Stem Rev Nitrided	S-ROM ZTT2 Acet. Shell	4	84.8	0	0.00	0.00	4.35
ZMR Fem Stem Rev Nitrided	Trabecular Metal Shell	10	82.1	0	0.00	0.00	4.49
ZMR Fem Stem Rev Nitrided	Trilogy	11	126.3	2	1.58	0.19	5.72
ZMR Fem Stem Rev Taper	CLS Expansion	2	40.0	0	0.00	0.00	9.23
ZMR Fem Stem Rev Taper	Contemporary	1	0.3	0	0.00	0.00	1403.50
ZMR Fem Stem Rev Taper	Duraloc	3	20.9	0	0.00	0.00	17.62
ZMR Fem Stem Rev Taper	R3 porous	1	0.0	0	0.00	0.00	22456.05
ZMR Fem Stem Rev Taper	Trabecular Metal Shell	2	18.3	0	0.00	0.00	20.20
ZMR Fem Stem Rev Taper	Trilogy	2	8.3	0	0.00	0.00	44.41
ZMR Fem Stem Rev Taper	ZCA	1	21.5	0	0.00	0.00	17.15

KNEE ARTHROPLASTY

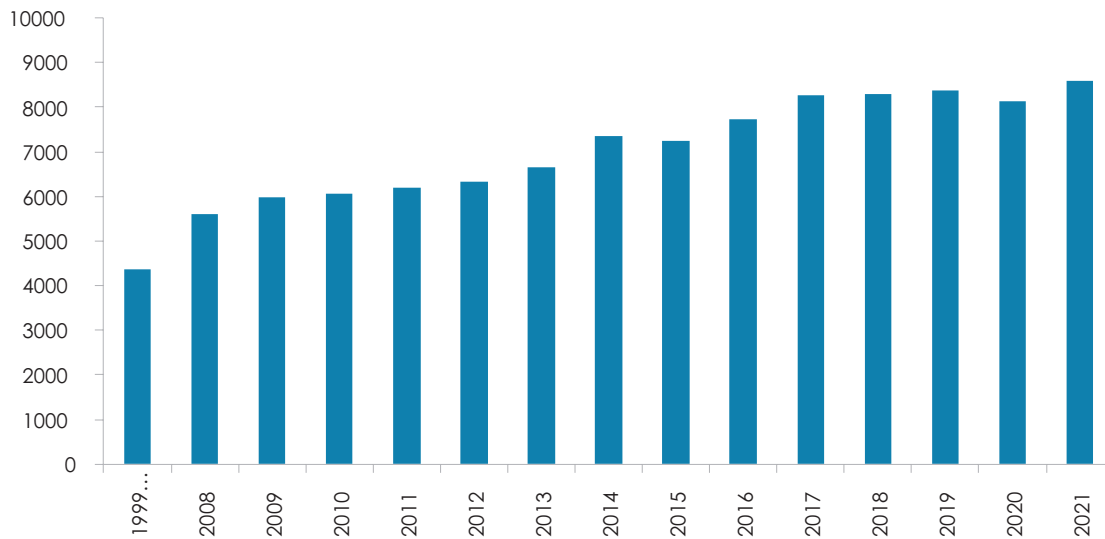
PRIMARY KNEE ARTHROPLASTY

The **twenty-three-year** report analyses data for the period January 1999 – December 2021.

New data forms introduced in October 2020 have 3 categories of knee replacement. These are total knees with 135,699 registered, 15,878 unicompartamental

knees with medial or lateral approach registered and patellofemoral knees with 811 registered. There were 9,860 new registrations in 2021.

Primary Knee Arthroplasty by Year



Data Analysis

This data form analysis includes new form and legacy data and is for total knee replacement.

Total knee arthroplasty	Female	Male
Number	69,467	65,735
Percentage	51.38	48.62
Mean age	68.58	67.87
Maximum age	100.49	98.68
Minimum age	10.17	8.19
Standard dev.	9.60	9.18

Patellofemoral Arthroplasty	Female	Male
Number	588	223
Percentage	72.50	27.5
Mean age	59.97	60.57
Maximum age	89.39	90.72
Minimum age	31.15	31.25
Standard dev.	11.15	10.71

Unicompartamental knees	Female	Male
Number	7,132	8,746
Percentage	44.91	55.08
Mean age	65.91	66.23
Maximum age	94.71	94.55
Minimum age	18.28	30.98
Standard dev.	10.11	9.18

Body Mass Index

For the twelve-year period 2010 - 2021, there were 73,957 BMI registrations for total knee replacements. The average was 31.26 with a range of 12.5 – 70.0 and a standard deviation of 5.91.

BMI (kg/m2)	N
< 19	118
19 - 24	6,831
25 - 29	20,899
30 - 39	30,485
40+	6,235

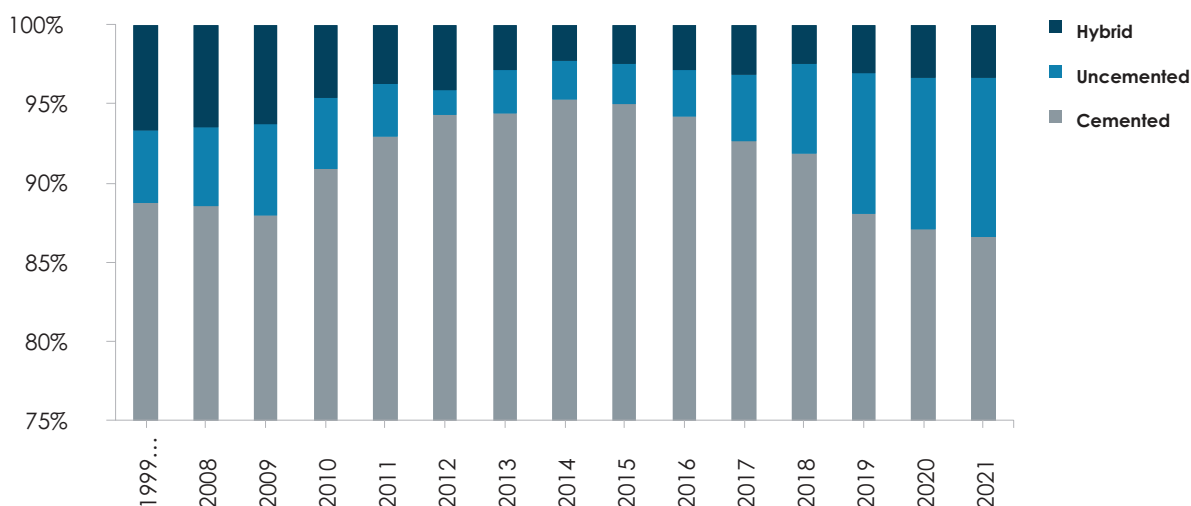
Previous operation	N
None	113,646
Meniscectomy	13,527
Osteotomy	1,879
Ligament reconstruction	2,215
Internal fixation	1,111
Synovectomy	213

Approach	N
Media parapatellar	122,517
Lateral parapatellar	1,570
Other	2,629

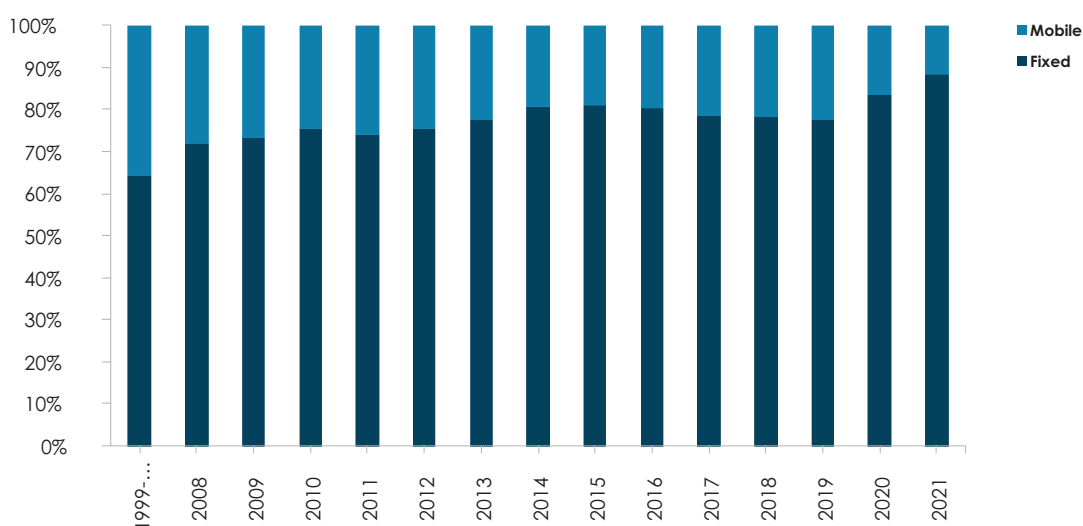
Image Guided	N
Not image guided	114,055
Image guided	21,643

Diagnosis	N
Osteoarthritis	128,501
Rheumatoid arthritis/other inflammatory	3,577
Post ligament-disruption/reconstruction	1,432
Post ligament fracture	1,474
Avascular necrosis	435
Tumour	121

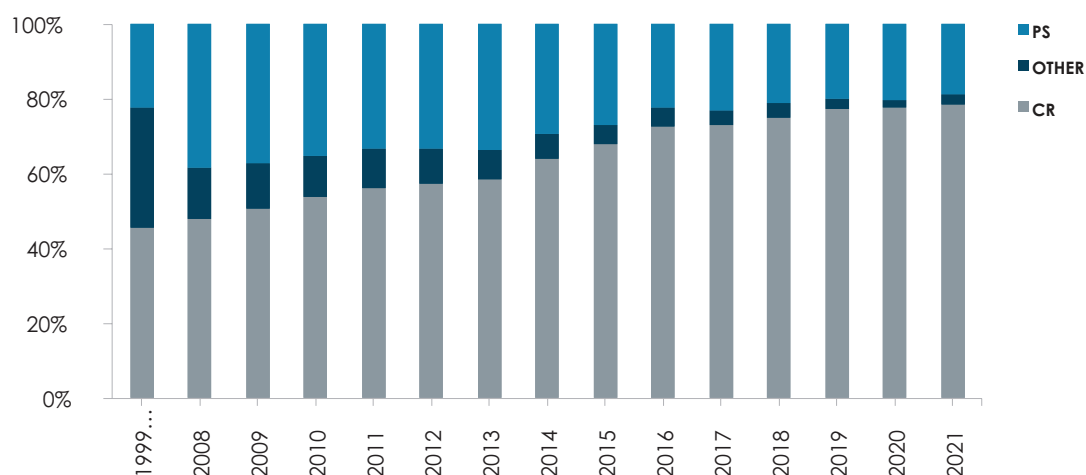
Proportions of Cemented, Uncemented and Hybrid Primary Arthroplasty by Year



Proportion of Fixed and Mobile Knees by Year



Proportion of Posterior Stabilized, Cruciate Retaining and Minimally Stabilized Knees by Year



OTHER = minimally stabilised of which 98% are LCS

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic
150,673 (99%)

Theatre	N
Conventional	73,516
Laminar Flow	60,738

Surgeon attire	N
One-piece Toga	2,019
Sterile Hood and Gown	1,558
Conventional	5,085
Space Suits/Helmet Fan	46,186

ASA Class

This was introduced with the updated forms at the beginning of 2005. For the seventeen-year period 2005 – 2021, there were 112 650 (96%) primary knee procedures with the ASA class recorded.

ASA Class	ASA Definition	N	%
1	A healthy patient	11,956	10.6
2	Mild systemic disease	71,488	63.4
3	Moderate systemic disease	28,751	25.5
4	Incapacitating systemic disease	456	0.4

Operative time (skin to skin)

Average 82 mins, SD 28.45 mins

Surgeons, Hospitals & Environment

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the seventeen-year period 2005 – 2021.

Surgeon Grade	N
Consultant	103,694
Advanced trainee supervised	9,189
Advanced trainee unsupervised	2,122
Basic trainee	1,806

Surgeon and hospital workload

Surgeons

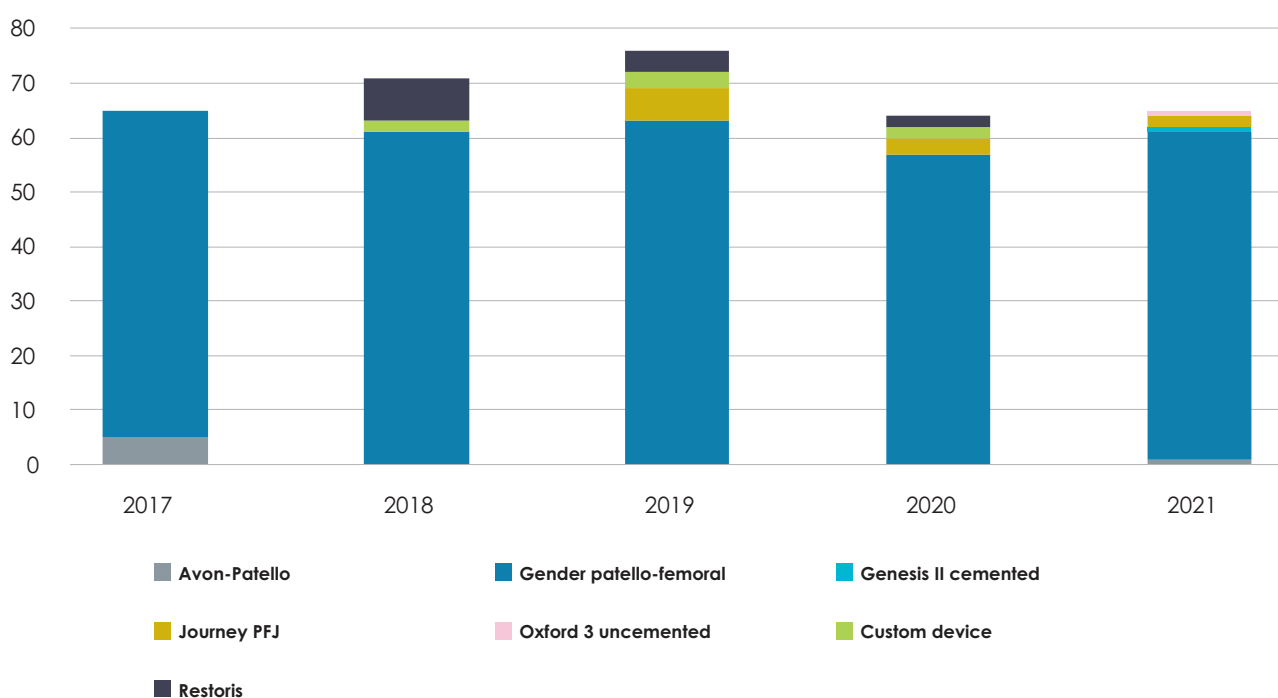
In 2021, 228 surgeons performed 9,833 total knee replacements, an average of 43 procedures per surgeon.

33 surgeons performed less than 10 procedures and 91 performed more than 40.

Hospitals

In 2021 total knee replacement was performed in 52 hospitals. 27 were public hospitals and 25 were private.

Patello-femoral prostheses used 2017-2021



Prosthesis Usage

Patello-femoral prostheses used in 2021

Prosthesis	N
Gender patello-femoral	60
Journey PFJ	2
Avon-Patello	1
Genesis II cemented	1
Oxford 3 uncemented	1

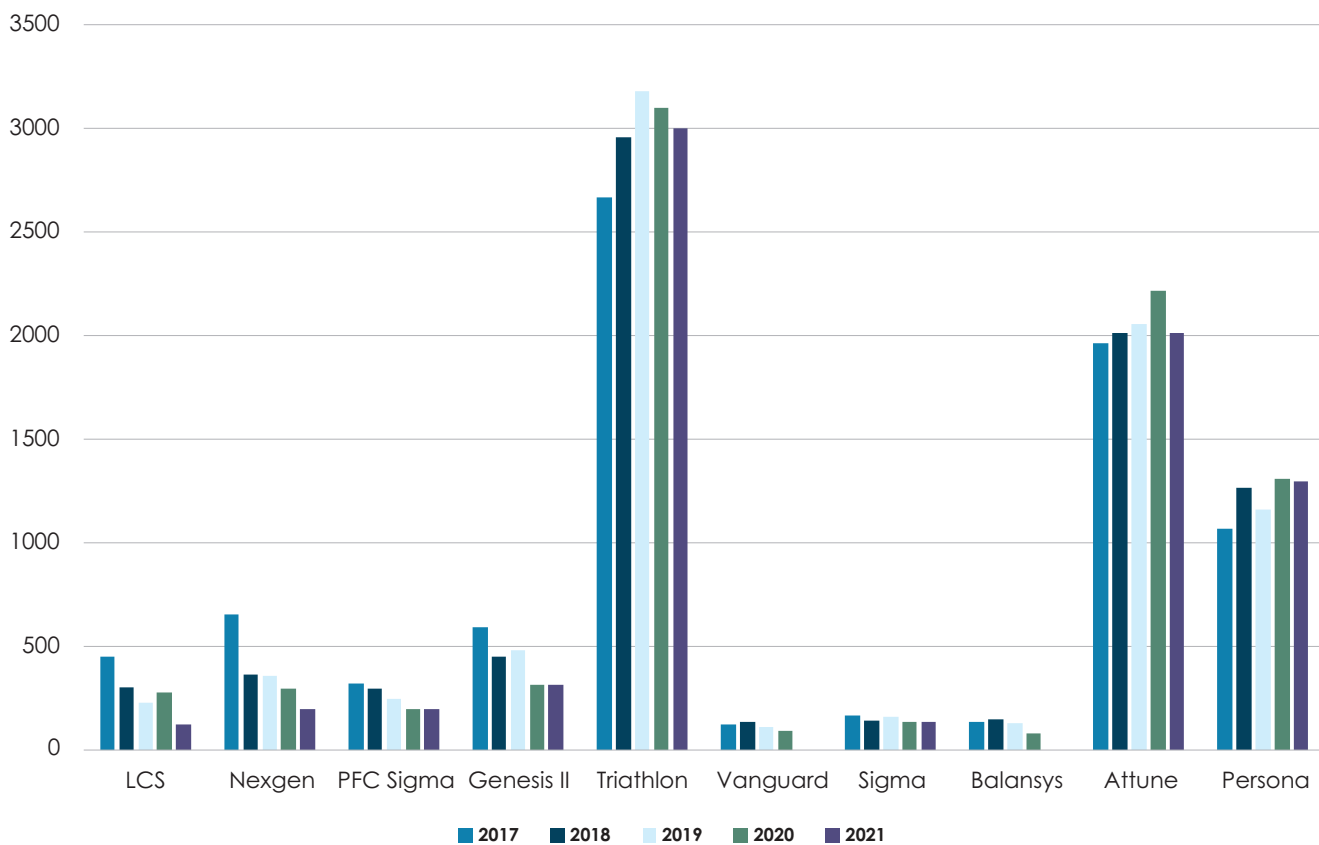
Total knee arthroplasty prosthesis usage in 2021

Top 10 Knee – Femur

Description	N
Triathlon cemented	2,485
Attune cemented	2,011
Persona cemented	1,293
Triathlon uncemented	616
Genesis II cemented	310
Attune uncemented	206
Nexgen CR-Flex cemented	198
PFC Sigma cemented	193
Sigma cemented	136
LCS Complete uncemented	121



Most used total knee prostheses per year for five years 2017 – 2021



REVISION KNEE ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced knee joint, during which one or more of the components is exchanged, removed, manipulated or added.

Procedures where all components are removed (e.g., Girdlestone, ankle fusion post failed ankle replacement, or removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

Data analysis

For the twenty-three-year period January 1999 – December 2021, there were 10,692 revision knee procedures registered. This is an additional 714 compared to last year's report.

The average age for a revision knee replacement was 70 years, with a range of 11 – 98 years.

All Primary Total Knee Arthroplasties

No. Ops.	Observed Comp. Yrs	Number Revised	Rate/100-Component-years	Exact 95% Confidence Interval	
135,698	1039769.3	4,838	0.4653	0.45	0.48

Body Mass Index

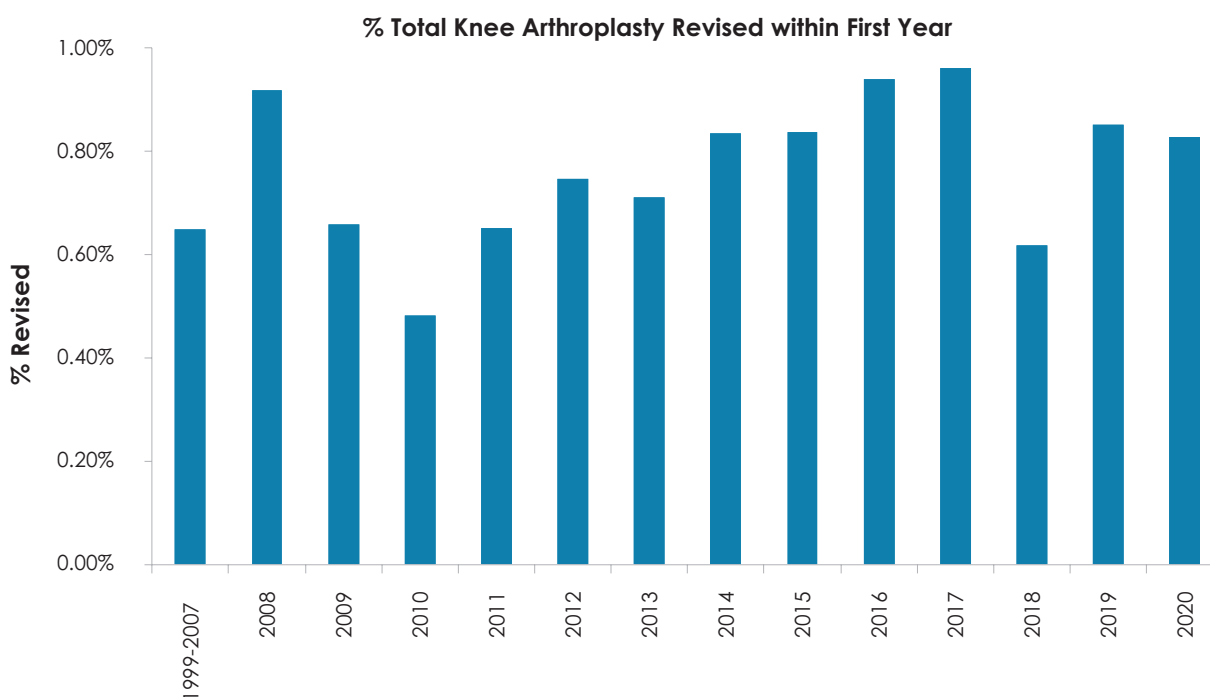
For the twelve-year period 2010 - 2021, there were 3,040 BMI registrations for revision knee replacements. The average BMI was 31.56 kg/m² with a range of 15 – 65 and a standard deviation of 6.15.

This section analyses data for revisions of the primary registered total knee arthroplasties for the twenty-three-year period.

There were 4,838 revisions of the 135,698 primary total knee replacements, 97 revisions of the 811 patellofemoral knees and 1,371 revisions of the 15,878 unicompartamental knees.

Total knee replacement analysis - this includes new form and legacy reasons for revision

Time to revision- days	N
Average	1,661 (4.5 years)
Maximum	8,088
Minimum	1
Standard deviation	1,598





Reason for revision	N
Deep infection	1,305
Unexplained pain	1,306
Loosening tibial	1,122
Loosening femoral	511
Loosening patellar	100
Fracture femur	101
Fracture tibia	54
Wear in non-replaced compartment	22
Stiffness/arthrofibrosis	29
Instability	61
Poly wear	28
Periprosthetic Fracture	19

Analysis of the four main reasons for revision by year after primary procedure

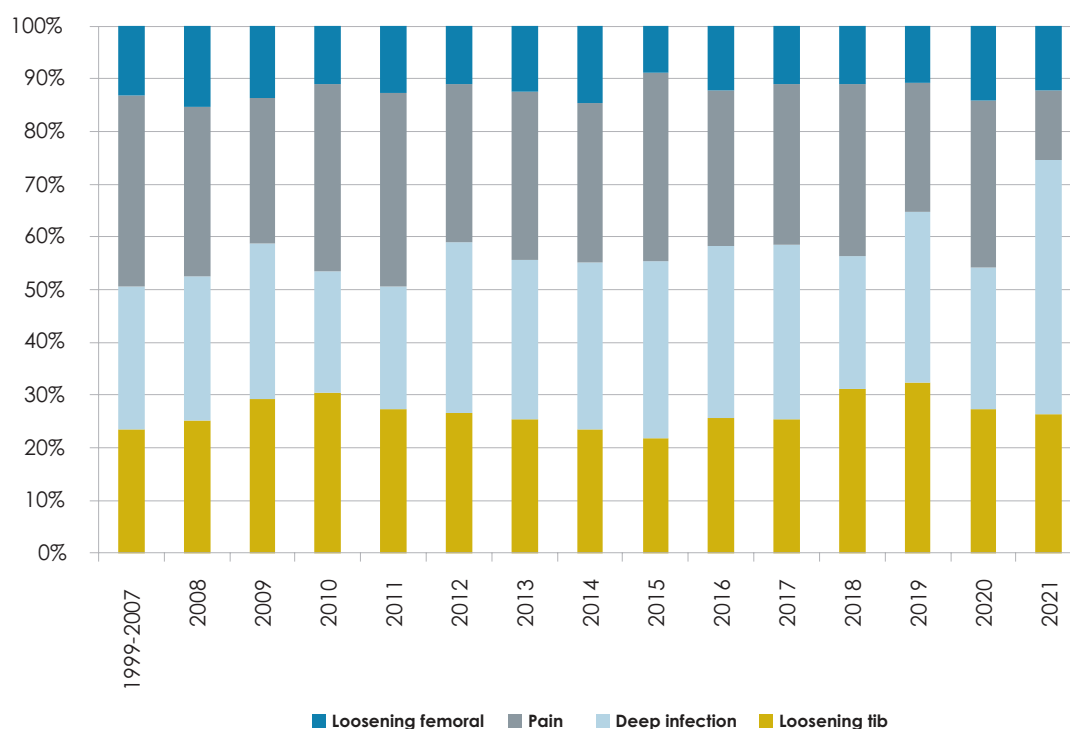
NB each year column does not add up to exactly 100% as often more than one cause for revision is listed and there are other reasons for revision other than the five above listed in the registry

Years	Loosening tibial component		Deep infection		Pain		Loosening femoral component	
	Count	%	Count	%	Count	%	Count	%
0	55	4.8	500	38.3	163	12.3	21	4.0%
1	97	8.5	228	17.4	327	24.8	42	8.0%
2	131	11.5	123	9.4	202	15.3	38	7.3%
3	120	10.6	106	8.1	120	9.1	41	7.8%
4	96	8.5	67	5.1	90	6.8	52	9.9%
5	90	7.9	53	4.1	70	5.3	40	7.6%
6	96	8.5	49	3.7	56	4.2	35	6.7%
7	79	7.0	35	2.7	58	4.4	34	6.5%
8	56	4.9	26	2.0	48	3.6	29	5.5%
9	62	5.5	27	2.1	30	2.3	27	5.2%
10	48	4.2	19	1.5	38	2.9	26	5.0%
>10	205	18.1	74	5.7	118	8.9	138	26.4%
	1,135		1,307		1,320		523	

Analysis by numbers of the four main reasons for revision by year

	Loosening tibial component	Deep infection	Pain	Loosening femoral component
Years	Number	Number	Number	Number
1999-2007	147	171	227	82
2008	43	47	55	26
2009	54	54	51	25
2010	53	40	62	19
2011	52	44	70	24
2012	56	68	63	23
2013	62	73	78	30
2014	63	85	81	39
2015	59	91	97	24
2016	91	115	105	43
2017	86	112	103	37
2018	96	77	100	34
2019	109	110	83	36
2020	95	94	111	49
2021	69	126	34	32

Percentage of the Four Main Reasons for Revision by Year





Patello-Femoral Arthroplasty

No. Ops.	Sum comp. Years	Number Revised	Rate/100-Component-years	Exact 95% Confidence Interval	
811	4820.5	92	1.91	1.54	2.34

The revision rate is four times that for total knee arthroplasty.

REVISION OF PATELLO-FEMORAL KNEES

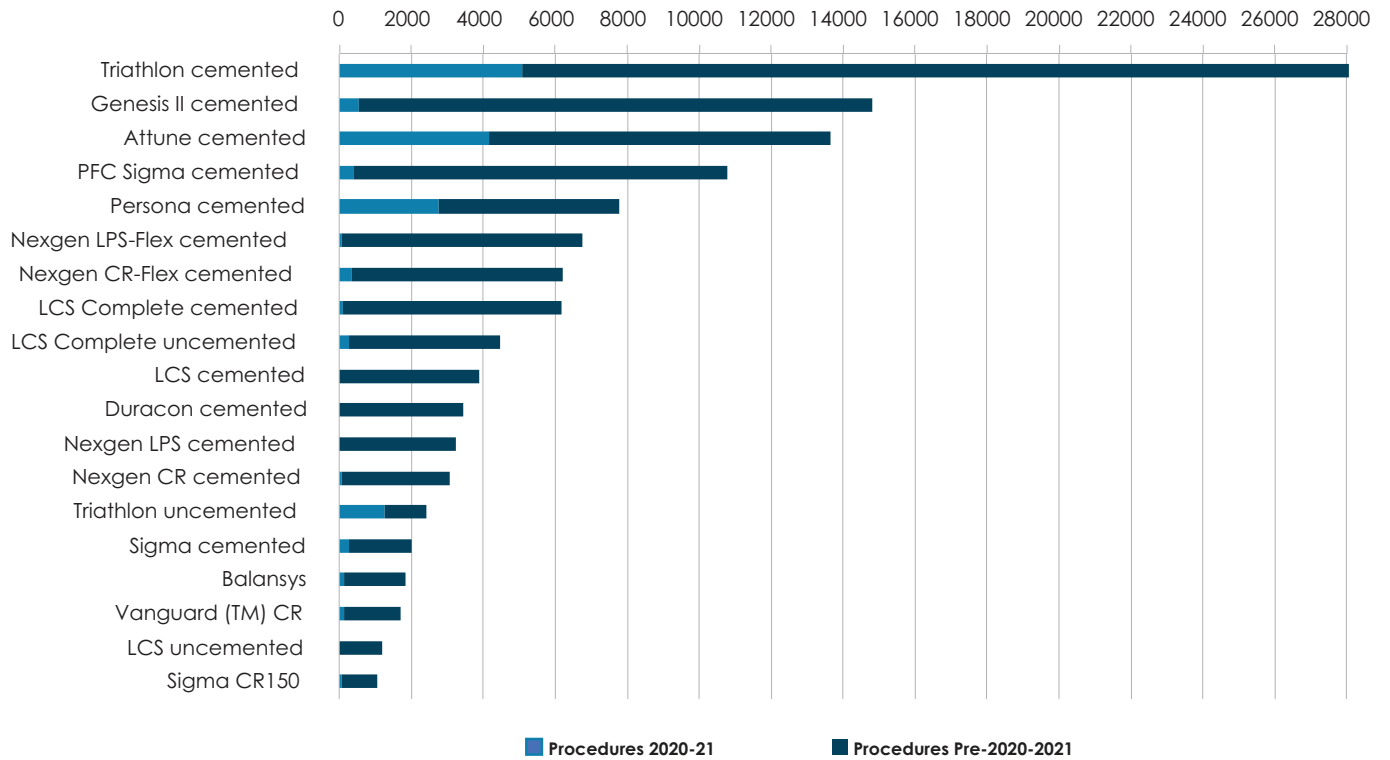
Of the 811 registered, n = 92 have been revised.

Time to revision- days	N
Average	1,963 (5.3 years)
Maximum	5,718
Minimum	108
Standard deviation	1,513

Reason for revision	N
Pain	29
Deep infection	7
Loosening patellar	4
Loosening femoral	1
Wear in non-replaced compartment	5
Instability	2
Polywear	1
Other	53

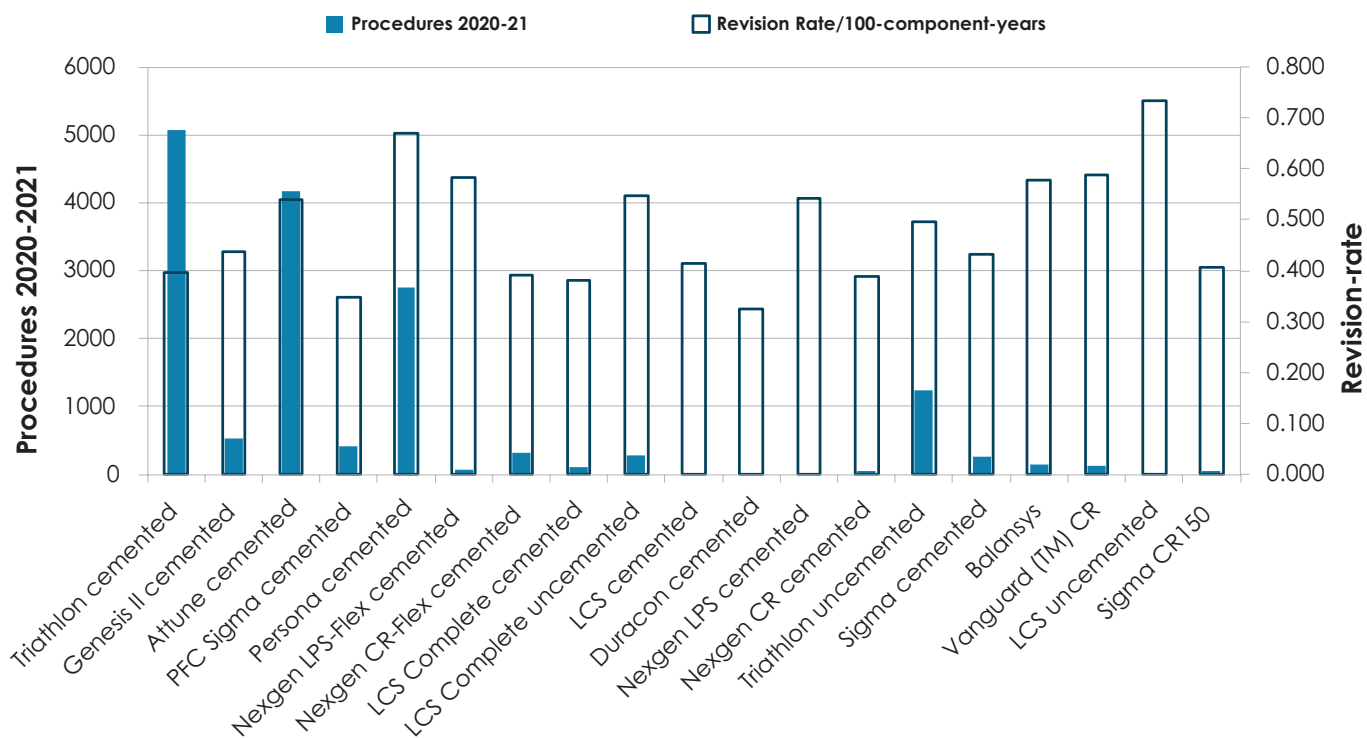
More than one reason for revision can be listed and all are registered.

The figure below summarises the 19 Knee prostheses with >1000 procedures. Showing the number of procedures for the history of the Registry and for the previous 2 years.





The figure below summarises the 19 Knee prostheses with >1000 procedures. Showing the number of procedures for the previous 2 years and the historical revision rate.



Revision Rate of Individual Knee Prostheses Sorted by Number of Arthroplasties

(Minimum of 50 arthroplasties)

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Triathlon cemented	30,777	184755.8	734	0.397	0.369	0.427
Genesis II cemented	14,797	131714.0	577	0.438	0.403	0.475
Attune cemented	13,653	46074.4	249	0.540	0.475	0.612
PFC Sigma cemented	10,775	109715.5	383	0.349	0.315	0.386
Persona cemented	7,768	23164.2	155	0.669	0.568	0.783
Nexgen LPS-Flex cemented	6,748	65406.2	381	0.583	0.525	0.644
Nexgen CR-Flex cemented	6,214	48668.9	191	0.392	0.339	0.452
LCS Complete cemented	6,165	62809.1	239	0.381	0.334	0.432
LCS Complete uncemented	4,449	39225.5	215	0.548	0.476	0.625
LCS cemented	3,881	52508.7	217	0.413	0.359	0.471
Duracon cemented	3,445	44300.3	144	0.325	0.274	0.383
Nexgen LPS cemented	3,237	35070.1	190	0.542	0.466	0.623
Nexgen CR cemented	3,069	37175.2	145	0.390	0.328	0.457
Triathlon uncemented	2,400	6235.3	31	0.497	0.338	0.706
Sigma cemented	2,012	12019.7	52	0.433	0.323	0.567
Balansys	1,827	11088.3	64	0.577	0.445	0.737
Vanguard (TM) CR	1,705	11917.7	70	0.587	0.458	0.742
LCS uncemented	1,169	16783.3	123	0.733	0.609	0.874
Sigma CR150	1,057	8857.2	36	0.406	0.280	0.556
Trekking	994	5186.5	39	0.752	0.535	1.028
Attune uncemented	869	1633.7	16	0.979	0.560	1.590
Scorpio	853	10795.6	72	0.667	0.522	0.840
Maxim	825	10822.7	66	0.610	0.472	0.776
Duracon uncemented	797	11005.9	28	0.254	0.169	0.368
PFC Sigma uncemented	689	5507.9	33	0.599	0.405	0.831
Vanguard (TM) PS	619	4446.3	39	0.877	0.614	1.186
Nexgen CR uncemented	487	5791.7	23	0.397	0.252	0.596
AGC cemented	393	4956.3	20	0.404	0.239	0.611
Optetrak uncemented	380	3966.6	37	0.933	0.646	1.271
Journey II BCS	373	1171.7	12	1.024	0.529	1.789
Nexgen LCCK cemented	328	2035.5	24	1.179	0.755	1.754
Nexgen CR-Flex uncemented	289	1670.9	9	0.539	0.246	1.023
Optetrak cemented	281	2976.2	34	1.142	0.777	1.577
Insall/Burstein	249	3160.2	48	1.519	1.120	2.014



Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
MBK cemented	247	3569.5	18	0.504	0.299	0.797
Nexgen LPS uncemented	164	1593.5	7	0.439	0.157	0.863
Saiph	162	517.4	4	0.773	0.211	1.979
Advance cemented	160	1982.3	6	0.303	0.111	0.659
Legion Oxinium	150	934.0	5	0.535	0.174	1.249
Journey BCS	143	1480.6	18	1.216	0.721	1.921
AMK cemented	95	1360.5	2	0.147	0.018	0.531
Legion PS cemented	92	476.9	6	1.258	0.462	2.738
Medacta component	91	99.9	4	4.003	0.845	10.248
LCS Complete RPS	70	607.0	4	0.659	0.180	1.687
Nexgen cemented	51	274.6	11	4.006	2.000	7.169
Zimmer	51	176.0	4	2.272	0.619	5.818

Revision Rate of Individual Knee Prostheses Sorted by Revision Rate
(Minimum of 50 arthroplasties)

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Nexgen cemented	51	274.6	11	4.006	2.000	7.169
Femoral component	91	99.9	4	4.003	0.845	10.248
Zimmer	51	176.0	4	2.272	0.619	5.818
Insall/Burstein	249	3160.2	48	1.519	1.120	2.014
Legion PS cemented	92	476.9	6	1.258	0.462	2.738
Journey BCS	143	1480.6	18	1.216	0.721	1.921
Nexgen LCCK cemented	328	2035.5	24	1.179	0.755	1.754
Optetrak cemented	281	2976.2	34	1.142	0.777	1.577
Journey II BCS	373	1171.7	12	1.024	0.529	1.789
Attune uncemented	869	1633.7	16	0.979	0.560	1.590
Optetrak uncemented	380	3966.6	37	0.933	0.646	1.271
Vanguard (TM) PS	619	4446.3	39	0.877	0.614	1.186
Saiph	162	517.4	4	0.773	0.211	1.979
Trekking	994	5186.5	39	0.752	0.535	1.028
LCS uncemented	1,169	16783.3	123	0.733	0.609	0.874
Persona cemented	7,768	23164.2	155	0.669	0.568	0.783
Scorpio	853	10795.6	72	0.667	0.522	0.840
LCS Complete RPS	70	607.0	4	0.659	0.180	1.687
Maxim	825	10822.7	66	0.610	0.472	0.776
PFC Sigma uncemented	689	5507.9	33	0.599	0.405	0.831
Vanguard (TM) CR	1,705	11917.7	70	0.587	0.458	0.742

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Nexgen LPS-Flex cemented	6,748	65406.2	381	0.583	0.525	0.644
Balansys	1,827	11088.3	64	0.577	0.445	0.737
LCS Complete uncemented	4,449	39225.5	215	0.548	0.476	0.625
Nexgen LPS cemented	3,237	35070.1	190	0.542	0.466	0.623
Attune cemented	13,653	46074.4	249	0.540	0.475	0.612
Nexgen CR-Flex uncemented	289	1670.9	9	0.539	0.246	1.023
Legion Oxinium	150	934.0	5	0.535	0.174	1.249
MBK cemented	247	3569.5	18	0.504	0.299	0.797
Triathlon uncemented	2,400	6235.3	31	0.497	0.338	0.706
Nexgen LPS uncemented	164	1593.5	7	0.439	0.157	0.863
Genesis II cemented	14,797	131714.0	577	0.438	0.403	0.475
Sigma cemented	2,012	12019.7	52	0.433	0.323	0.567
LCS cemented	3,881	52508.7	217	0.413	0.359	0.471
Sigma CR150	1,057	8857.2	36	0.406	0.280	0.556
AGC cemented	393	4956.3	20	0.404	0.239	0.611
Triathlon cemented	30,777	184755.8	734	0.397	0.369	0.427
Nexgen CR uncemented	487	5791.7	23	0.397	0.252	0.596
Nexgen CR-Flex cemented	6,214	48668.9	191	0.392	0.339	0.452
Nexgen CR cemented	3,069	37175.2	145	0.390	0.328	0.457
LCS Complete cemented	6165	62809.1	239	0.381	0.334	0.432
PFC Sigma cemented	10,775	109715.5	383	0.349	0.315	0.386
Duracon cemented	3,445	44300.3	144	0.325	0.274	0.383
Advance cemented	160	1982.3	6	0.303	0.111	0.659
Duracon uncemented	797	11005.9	28	0.254	0.169	0.368
AMK cemented	95	1360.5	2	0.147	0.018	0.531



Revision vs Arthroplasty Fixation for Fully Cemented Prostheses Sorted by Revision Rate

(Minimum of 50 arthroplasties)

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Triathlon cemented	30,731	184651.7	734	0.398	0.369	0.427
Genesis II cemented	14,793	131685.0	576	0.437	0.402	0.474
Attune cemented	13,642	46053.1	249	0.541	0.476	0.612
PFC Sigma cemented	10,565	107428.0	373	0.347	0.313	0.384
Persona cemented	7,768	23164.2	155	0.669	0.568	0.783
Nexgen LPS-Flex cemented	6,748	65406.2	381	0.583	0.525	0.644
Nexgen CR-Flex cemented	6,210	48647.6	191	0.393	0.339	0.452
LCS Complete cemented	6,131	62400.6	237	0.380	0.332	0.431
LCS cemented	3,835	51816.9	213	0.411	0.357	0.469
Duracon cemented	3,443	44264.1	144	0.325	0.274	0.383
Nexgen LPS cemented	3,233	35020.6	190	0.543	0.467	0.624
Nexgen CR cemented	3,063	37083.2	145	0.391	0.329	0.459
Balansys	1,827	11088.3	64	0.577	0.445	0.737
Vanguard (TM) CR	1,685	11772.0	68	0.578	0.449	0.732
Sigma cemented	1,614	10273.7	39	0.380	0.270	0.519
Sigma CR150	1,057	8857.2	36	0.406	0.280	0.556
Trekking	990	5183.1	39	0.752	0.535	1.029
Scorpio	853	10795.6	72	0.667	0.522	0.840
Maxim	825	10822.7	66	0.610	0.472	0.776
Vanguard (TM) PS	617	4437.5	39	0.879	0.615	1.188
AGC cemented	393	4956.3	20	0.404	0.239	0.611
Journey II BCS	373	1171.7	12	1.024	0.529	1.789
Nexgen LCCK cemented	328	2035.5	24	1.179	0.755	1.754
Optetrak cemented	281	2976.2	34	1.142	0.777	1.577
Insall/Burstein	249	3160.2	48	1.519	1.120	2.014
MBK cemented	247	3569.5	18	0.504	0.299	0.797
Saiph	162	517.4	4	0.773	0.211	1.979
Advance cemented	160	1982.3	6	0.303	0.111	0.659
Legion Oxinium	150	934.0	5	0.535	0.174	1.249
Journey BCS	143	1480.6	18	1.216	0.721	1.921
AMK cemented	95	1360.5	2	0.147	0.018	0.531
Legion PS cemented	92	476.9	6	1.258	0.462	2.738
Femoral component	91	99.9	4	4.003	0.845	10.248
LCS Complete RPS	65	557.4	4	0.718	0.196	1.837
Nexgen cemented	51	274.6	11	4.006	2.000	7.169

Revision vs Arthroplasty for Hybrid Fixation of Prostheses Sorted by Revision Rate

(Minimum of 50 primary registered arthroplasties)

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Attune uncemented	128	145.7	2	1.373	0.166	4.960
Optetrak uncemented	380	3966.6	37	0.933	0.646	1.271
Sigma cemented	398	1746.0	13	0.745	0.376	1.237
Triathlon uncemented	385	2200.5	16	0.727	0.416	1.181
Nexgen CR-Flex uncemented	242	1334.5	9	0.674	0.308	1.280
PFC Sigma uncemented	682	5417.9	33	0.609	0.412	0.845
LCS uncemented	643	8766.6	41	0.468	0.331	0.628
LCS Complete uncemented	1,738	15474.1	70	0.452	0.350	0.568
PFC Sigma cemented	210	2287.5	10	0.437	0.210	0.804
Nexgen CR uncemented	432	5171.6	19	0.367	0.221	0.574
Duracon uncemented	327	4969.8	15	0.302	0.169	0.498

Revision vs Arthroplasty Fixation for Fully Uncemented Prostheses Sorted by Revision Rate

(Minimum of 50 primary registered arthroplasties)

Femur Prosthesis	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
LCS uncemented	526	8016.8	82	1.023	0.814	1.270
Attune uncemented	740	1488.0	14	0.941	0.514	1.579
Nexgen CR uncemented	55	620.2	4	0.645	0.176	1.651
LCS Complete uncemented	2,711	23751.4	145	0.610	0.515	0.718
Nexgen LPS uncemented	136	1333.0	7	0.525	0.211	1.082
Triathlon uncemented	2,011	4033.5	15	0.372	0.208	0.613
Duracon uncemented	470	6036.1	13	0.215	0.109	0.358



Revision Rates for Fixed vs Mobile Bearing Knees

Femur Prosthesis	Mobile/ Fixed	No. Ops.	Sum comp. years	Events	Rate/100- component- years	Lower 95% CI	Upper 95% CI
Attune cemented	Fixed	4,941	21025.9	89	0.423	0.338	0.518
Attune cemented	Mobile	5,436	22607.1	130	0.575	0.480	0.683
Nexgen LPS cemented	Fixed	3,195	34577.8	189	0.547	0.470	0.629
Nexgen LPS cemented	Mobile	29	350.1	0	0.000	0.000	1.054
Nexgen LPS-Flex cemented	Fixed	4,057	37107.0	272	0.733	0.647	0.824
Nexgen LPS-Flex cemented	Mobile	2,683	28244.9	108	0.382	0.312	0.460
PFC Sigma cemented	Fixed	7,327	69695.4	244	0.350	0.308	0.397
PFC Sigma cemented	Mobile	3,413	39659.9	138	0.348	0.292	0.411
PFC Sigma uncemented	Fixed	666	5227.1	31	0.593	0.403	0.842
PFC Sigma uncemented	Mobile	22	271.6	2	0.736	0.089	2.660
Scorpio	Fixed	738	9334.4	60	0.643	0.491	0.827
Scorpio	Mobile	104	1384.7	9	0.650	0.297	1.234
Sigma cemented	Fixed	735	4317.9	13	0.301	0.160	0.515
Sigma cemented	Mobile	1,255	7549.3	39	0.517	0.367	0.706
Sigma CR150	Fixed	188	1637.2	11	0.672	0.335	1.202
Sigma CR150	Mobile	868	7213.0	25	0.347	0.224	0.512

Revision Rates for Cruciate Retaining (CR) vs Posterior Stabilised (PS)

Femur Prosthesis	CR/PS	No. Ops.	Sum comp. Years	Events	Rate/100- component- years	Lower 95% CI	Upper 95% CI
Attune cemented	CR	8,196	28603.9	153	0.535	0.452	0.625
	PS	5,406	17394.2	96	0.552	0.447	0.674
Attune uncemented	CR	713	1491.2	13	0.872	0.440	1.448
	PS	154	141.9	3	2.115	0.436	6.180
Balansys	CR	1,664	10327.1	54	0.523	0.393	0.682
	PS	113	697.0	10	1.435	0.639	2.545
Genesis II cemented	CR	7,898	74320.9	230	0.309	0.270	0.351
	PS	6,894	57352.9	347	0.605	0.543	0.672
Genesis II uncemented	CR	38	536.8	3	0.559	0.115	1.633
	PS	11	108.4	2	1.846	0.224	6.667
Maxim	CR	660	8636.7	47	0.544	0.400	0.724
	PS	165	2185.9	19	0.869	0.523	1.357
Nexgen cemented	CR	3,069	37175.2	145	0.390	0.328	0.457
	PS	3,237	35070.1	190	0.542	0.466	0.623

Femur Prosthesis	CR/PS	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Nexgen uncemented	CR	487	5791.7	23	0.397	0.252	0.596
	PS	164	1593.5	7	0.439	0.157	0.863
Nexgen Flex cemented	CR	6,214	48668.9	191	0.392	0.339	0.452
	PS	6,743	65382.9	381	0.583	0.526	0.644
Optetrak cemented	CR	83	921.8	8	0.868	0.375	1.710
	PS	198	2054.4	26	1.266	0.827	1.854
Optetrak uncemented	CR	354	3694.7	34	0.920	0.626	1.270
	PS	26	271.9	3	1.103	0.228	3.225
Persona cemented	CR	6,285	17811.7	109	0.612	0.500	0.735
	PS	1,483	5352.5	46	0.859	0.629	1.146
PFC Sigma cemented	CR	8,835	86672.9	273	0.315	0.278	0.354
	PS	1,891	22445.3	110	0.490	0.403	0.591
Scorpio	CR	740	9562.3	61	0.638	0.488	0.819
	PS	111	1216.8	11	0.904	0.451	1.617
Sigma cemented	CR	381	1998.6	2	0.100	0.005	0.321
	PS	1,631	10021.0	50	0.499	0.370	0.658
Trekking	CR	343	1954.3	17	0.870	0.487	1.361
	PS	640	3189.6	21	0.658	0.408	1.006
Triathlon cemented	CR	27,376	158125.1	611	0.386	0.356	0.418
	PS	3,398	26619.6	123	0.462	0.382	0.549
Triathlon uncemented	CR	2,306	5387.2	28	0.520	0.345	0.751
	PS	93	848.0	3	0.354	0.073	1.034
Vanguard™	CR	1,705	11917.7	70	0.587	0.458	0.742
	PS	619	4446.3	39	0.877	0.614	1.186

Overall Revision Rates for Cruciate Retaining, Posterior Stabilised and Minimally Stabilised Knees

Prosthesis	No. Ops	Observed comp. yrs	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
Cruciate Retaining	79,414	529676.8	2,150	0.41	0.39	0.42
Other	15,992	175893.1	820	0.47	0.43	0.50
Posterior Stabilised	33,541	261972.1	1556	0.59	0.56	0.62



Revision vs. Arthroplasty Fixation

Fixation	No. Ops	Observed comp. yrs	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
Cemented	123,047	939251.7	4270	0.45	0.44	0.47
Uncemented	6,782	46168.0	286	0.62	0.55	0.69
Hybrid	5,869	54349.5	282	0.52	0.46	0.58

Revision vs Age Bands

Age Bands	No. Ops	Observed comp. yrs	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
<40	401	4236.5	57	1.35	1.02	1.74
40-54	10,647	91169.0	767	0.84	0.78	0.90
55-64	37,964	310935.2	1,831	0.59	0.56	0.62
65-74	52,582	404652.6	1,608	0.40	0.38	0.42
>=75	34,104	228776.0	575	0.25	0.23	0.27

Revision vs Gender

Gender	No. Ops	Observed comp. yrs	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
F	69,735	545901.6	2,301	0.42	0.40	0.44
M	65,963	493867.6	2,537	0.51	0.49	0.53

Revision vs. Ethnicity

Ethnicity	No. Ops	Observed comp. yrs	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
Asian	4,379	29932.4	118	0.39	0.32	0.47
European/Other	115,147	887649.7	4180	0.47	0.46	0.49
Māori	8,027	53886.7	342	0.63	0.57	0.70
NR	3,324	34263.7	49	0.14	0.10	0.19
Pacifica	4,797	34031.0	149	0.44	0.37	0.51

Revision by Age Bands and Arthroplasty Fixation

Uncemented knees have a significantly higher revision rate than either cemented or hybrid knees. Further analyses have shown that it is loosening of the uncemented tibial component that is responsible for the higher revision rate.

Cemented	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<40	324	3400.4	42	1.24	0.88	1.65
40-54	9,072	76293.2	619	0.81	0.75	0.88
55-64	33,734	274816.6	1,607	0.58	0.56	0.61
65-74	48,163	371287.9	1,476	0.40	0.38	0.42
>=75	31,754	213453.7	526	0.25	0.23	0.27

Uncemented	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<40	38	448.0	9	2.01	0.84	3.67
40-54	905	8103.4	90	1.11	0.89	1.37
55-64	2,367	17302.8	108	0.62	0.51	0.75
65-74	2,323	14275.4	61	0.43	0.32	0.54
>=75	1,149	6038.5	18	0.30	0.17	0.46

Hybrid	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<40	39	388.2	6	1.55	0.57	3.36
40-54	670	6772.4	58	0.86	0.64	1.10
55-64	1,863	18815.8	116	0.62	0.51	0.74
65-74	2,096	19089.3	71	0.37	0.29	0.47
>=75	1,201	9283.9	31	0.33	0.22	0.47

Revision vs Approach

Approach	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Medial	122,517	935545.7	4,300	0.46	0.45	0.47
Lateral	1,570	13974.6	84	0.60	0.48	0.74
Other	2,629	23452.2	93	0.40	0.32	0.49

Revision vs Surgical Adjuncts

Image Guided	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Not image guided	114,055	921314.7	4,318	0.47	0.45	0.48
Image guided	21,643	118454.5	520	0.44	0.40	0.48



Revision vs Surgeon Annual Output

Operations per year	No. Ops.	Sum comp. Years	Number revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<10	2,629	22212.4	97	0.44	0.35	0.53
10-24	26,216	216375.5	1,137	0.53	0.50	0.56
25-49	51,314	401348.5	1,834	0.46	0.44	0.48
50-74	35,000	255439.6	1,208	0.47	0.45	0.50
75-99	9,143	63960.9	198	0.31	0.27	0.36
>=100	11,396	80432.4	364	0.45	0.41	0.50

Revision by ASA Status

ASA Class	No. Ops.	Sum comp. Years	Number revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
1	11,956	87493.1	423	0.48	0.44	0.53
2	71,488	478844.4	2,154	0.45	0.43	0.47
3	28,751	168525.5	909	0.54	0.50	0.58
4	456	2175.2	14	0.64	0.35	1.08

Revision vs. BMI (BMI collected by NZJR since 2010)

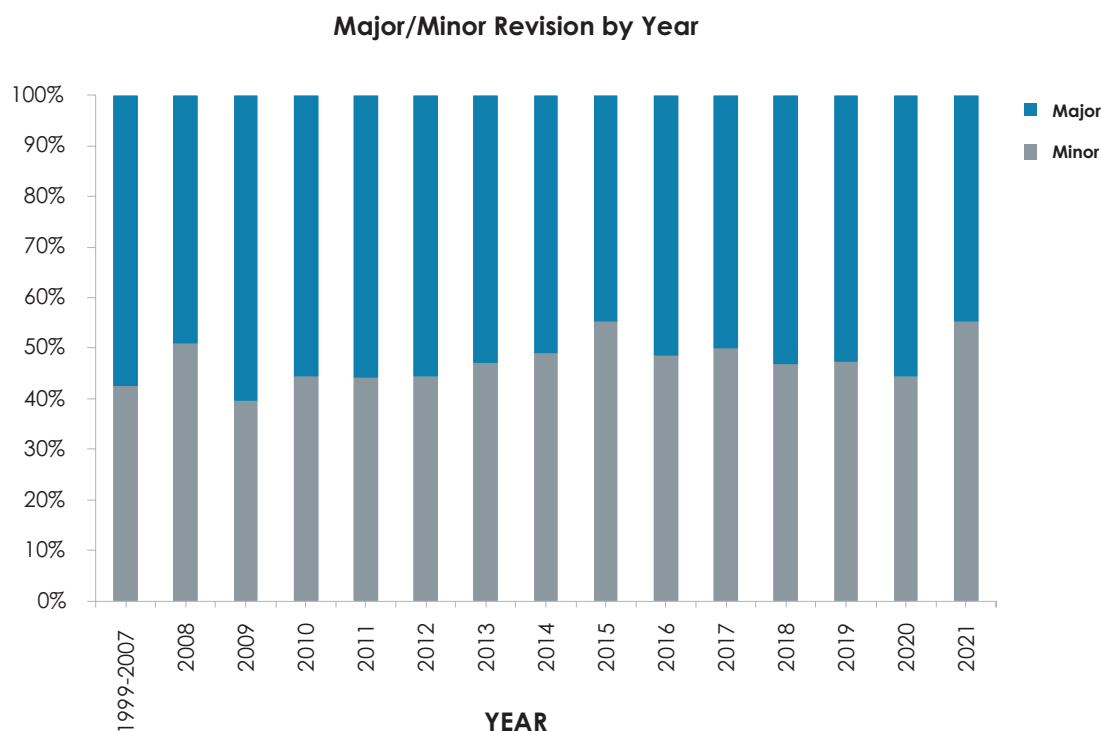
BMI Kg/m ²	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
< 19	118	587.8	1	0.17	0.00	0.80
19 - 24	6,831	32157.3	176	0.55	0.47	0.63
25 - 29	20,899	99199.6	482	0.49	0.44	0.53
30 - 39	30,485	142074.7	769	0.54	0.50	0.58
40+	6,235	28879.5	206	0.71	0.62	0.82

Revision vs. Public and Private Hospitals

Public/Private	No. Ops.	Sum comp. Years	Number revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Public	68,344	530084.8	2,411	0.45	0.44	0.47
Private	67,354	509684.5	2,427	0.48	0.46	0.50

Comparison of Major vs. Minor Revisions by Year

A major revision is defined as revision of tibial and/or femoral components, including any minor components and minor revision as change of bearing and/or patellar components only.



Re-revisions for major and minor knee revisions

Minor/Major	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Minor	2,291	12344.9	390	3.16	2.85	3.49
Major	2,547	14649.4	400	2.73	2.47	3.01

Overall Revision Rates for Fixed and Mobile Bearing Knees

Fixed/Mobile	No. Ops.	Sum comp. Years	Number revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Fixed	92,002	701921.7	3,165	0.45	0.44	0.47
Mobile	31,634	290061.9	1,325	0.46	0.43	0.48

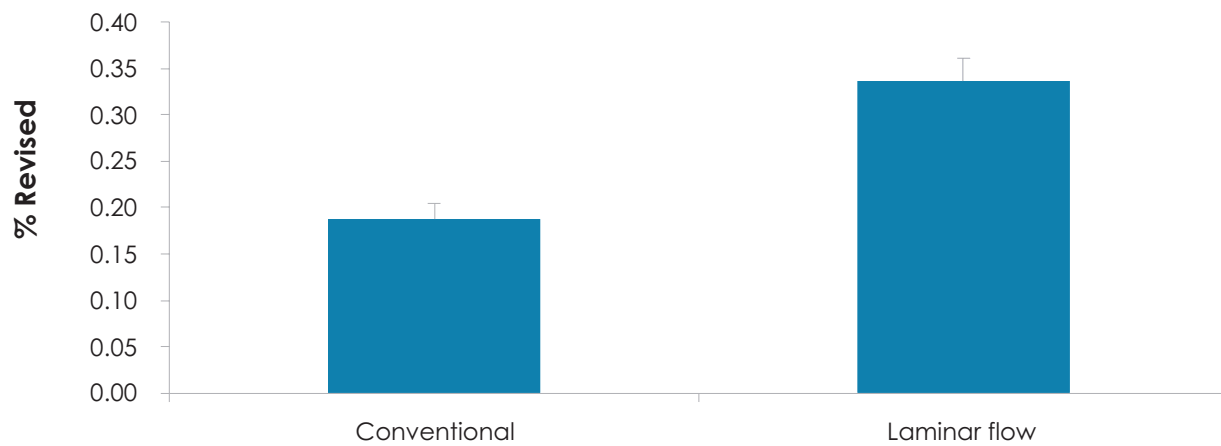
There is no significant difference between the two groups. It was not possible to determine fixed or mobile categories for all registered knees, which accounts for the discrepancy versus the total number of TKA's.

Revision for Deep Infection within six months versus Theatre Environment

Theatre Environment	Total number	Number revised	%	Standard error
Conventional	66,013	124	0.19	0.02
Laminar flow	53,897	181	0.33	0.02



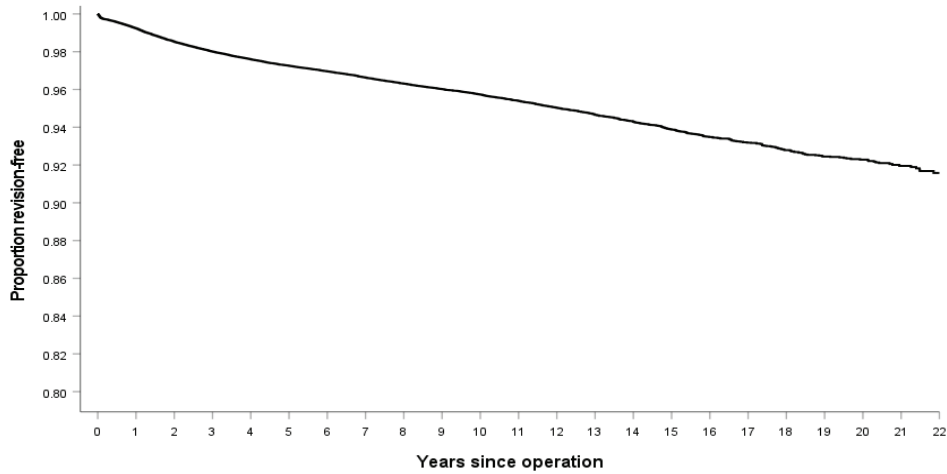
% Revision for Deep infection within 6 months



KAPLAN MEIER CURVES

The following Kaplan Meier survival analyses are for the 23 years 1999 – 2021 with deceased patients censored at time of death.

All Knees



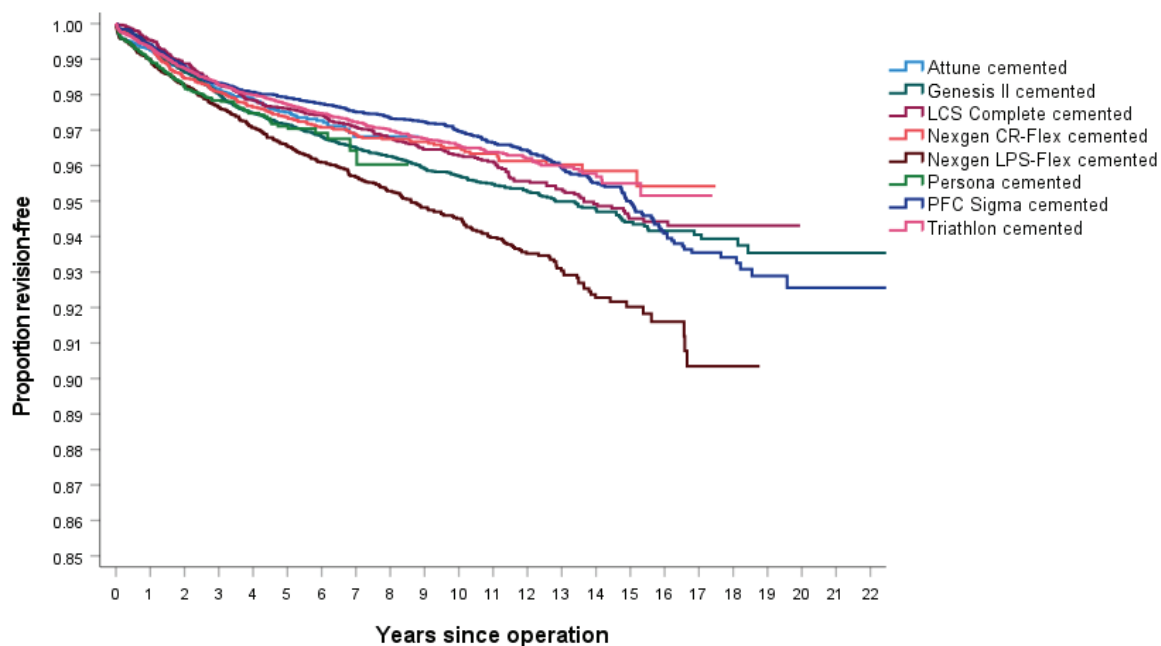
All	Years	% Revision-free	No. in each year
	1	99.2	125,106
	2	98.5	114,911
	3	98.0	104,570
	4	97.6	94,335
	5	97.3	84,395
	6	97.0	75,030
	7	96.6	66,265
	8	96.3	57,708
	9	96.0	49,898
	10	95.7	42,657
	11	95.4	36,017
	12	95.0	29,869
	13	94.7	24,162
	14	94.3	19,244
	15	93.9	14,753
	16	93.5	11,141
	17	93.2	8,012
	18	92.8	5,699
	19	92.5	4,081
	20	92.3	2,811
	21	92.0	1,718
	22	91.6	796



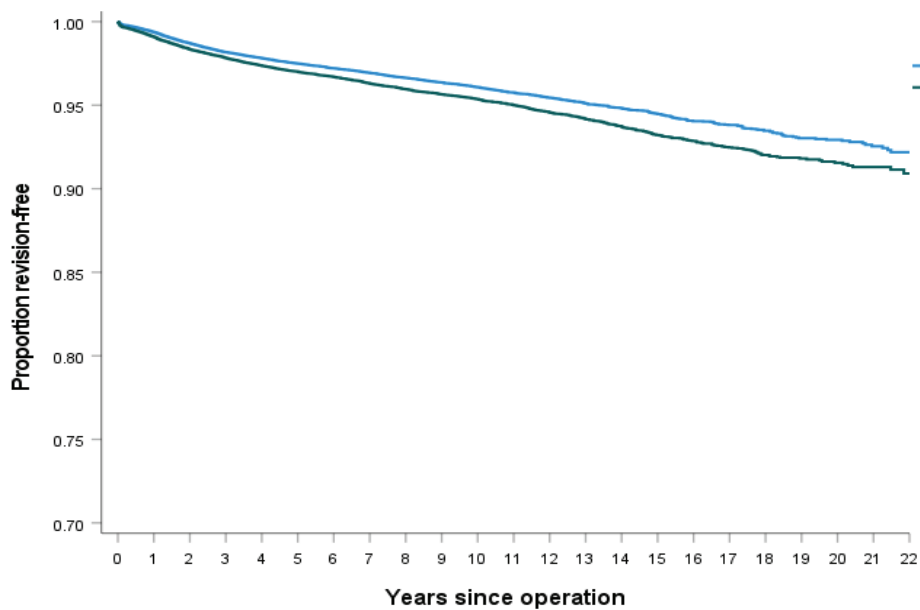
10 Year Survival Rates

Types	Years	% Revision-free	N
All	10	95.7	42,657
Hybrid	10	94.8	2,617
Uncemented	10	94.5	2,039
Cemented	10	95.8	38,001

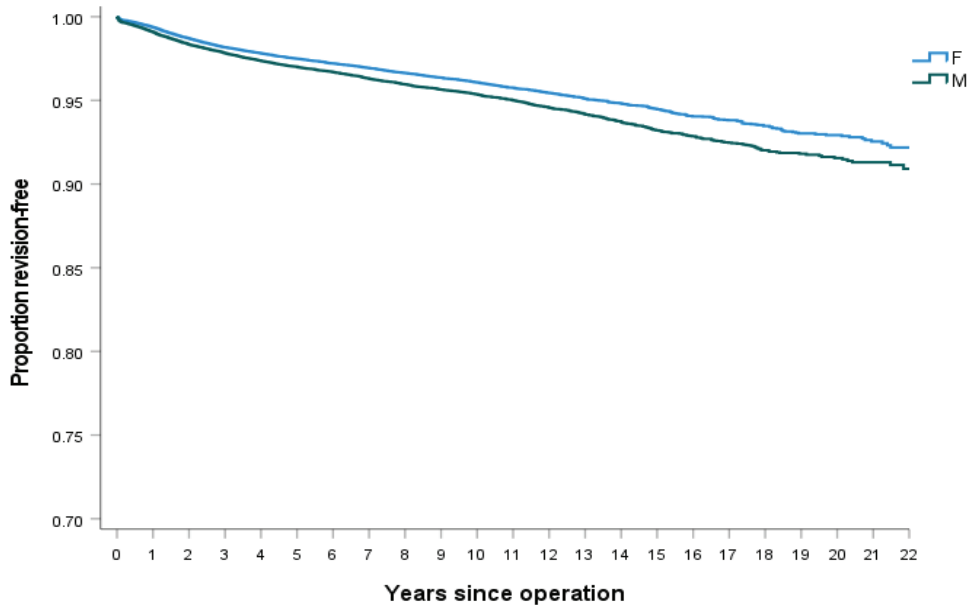
8 most common all >3500 procedures



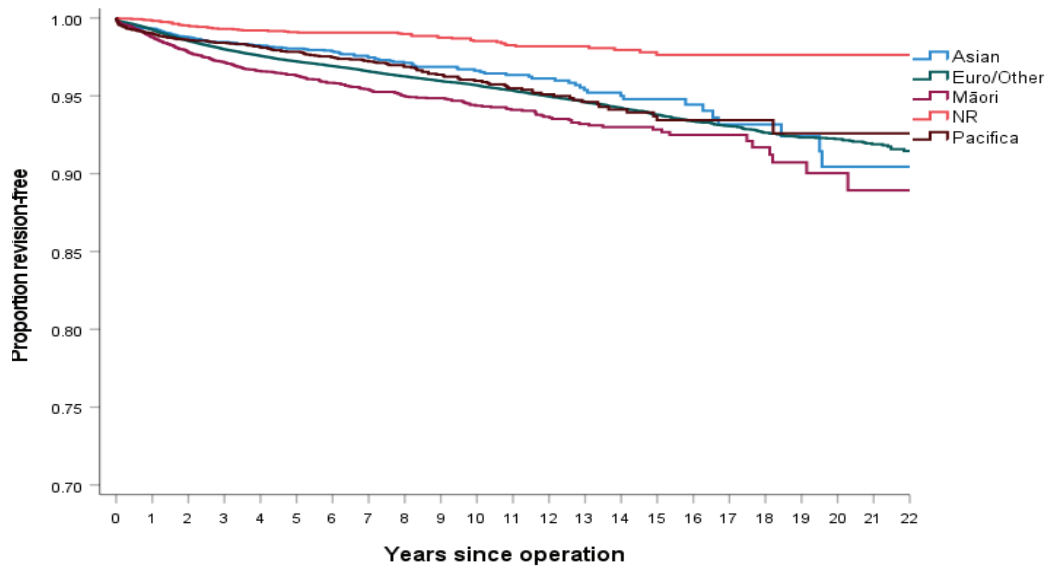
Survival for Male vs. Female



Survival for Age Bands

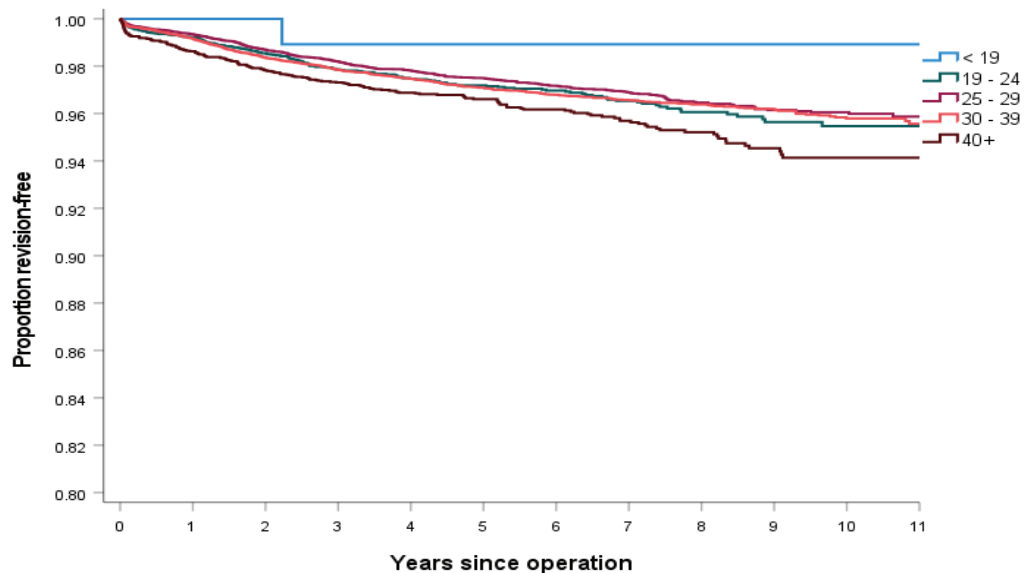


Survival for Ethnicity



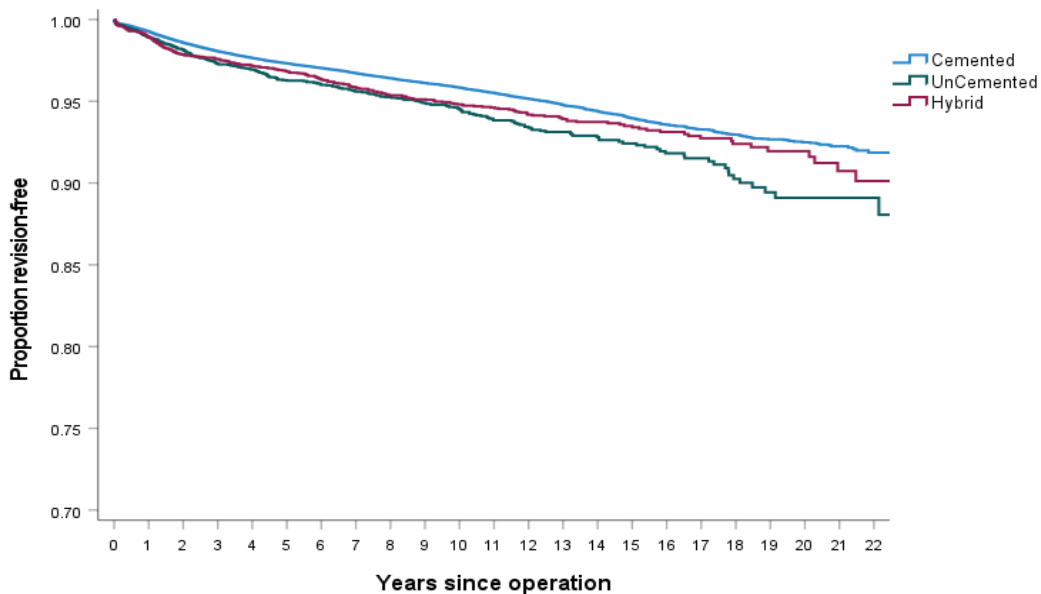
Survival for BMI groups

BMI has been collected by the NZJR since 2010

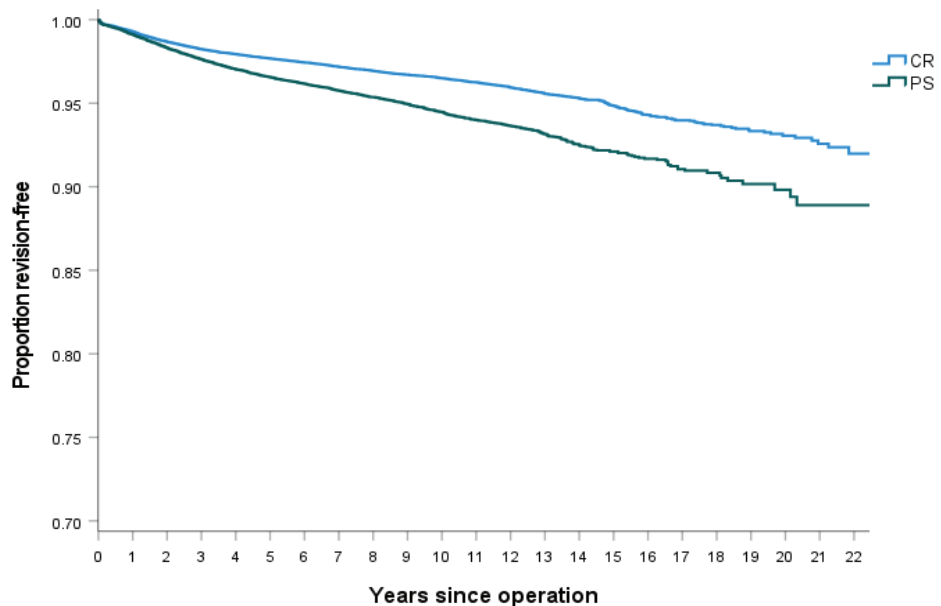




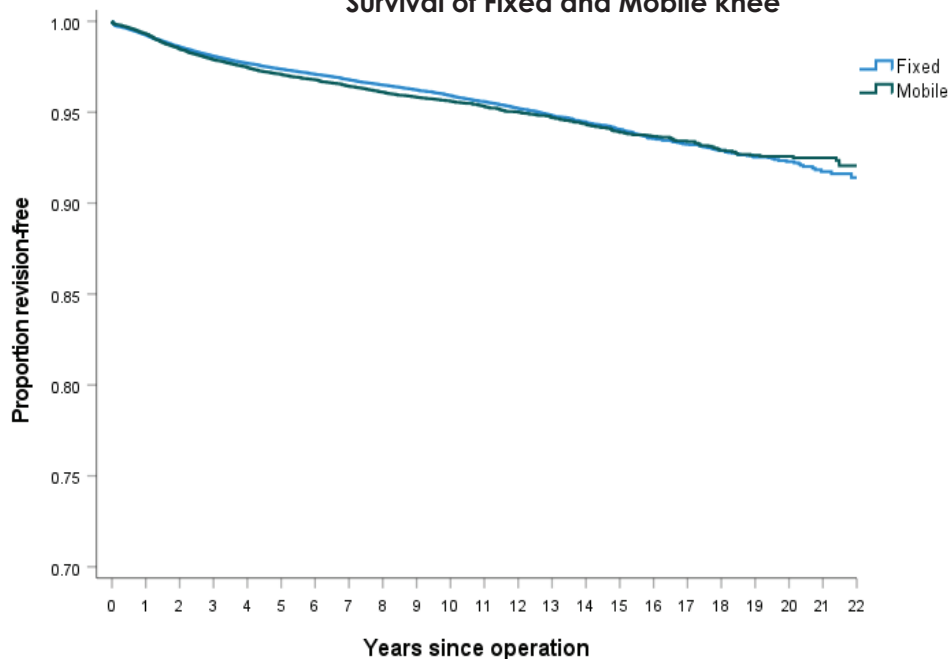
Survival by Cemented, Uncemented and Hybrid Prostheses



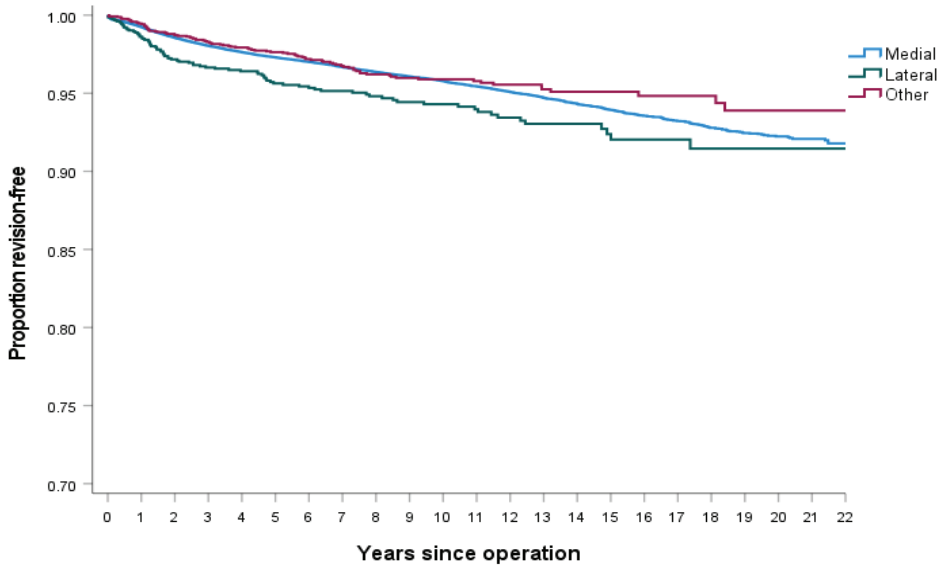
Survival of Posterior Stabilised and Cruciate Retaining Prostheses



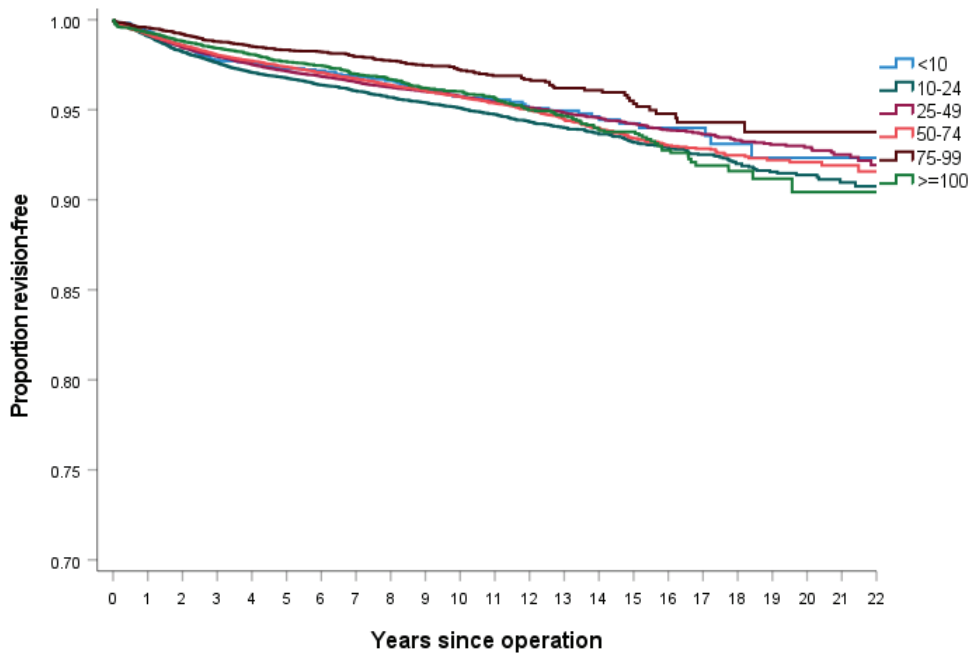
Survival of Fixed and Mobile knee



Survival by Approach

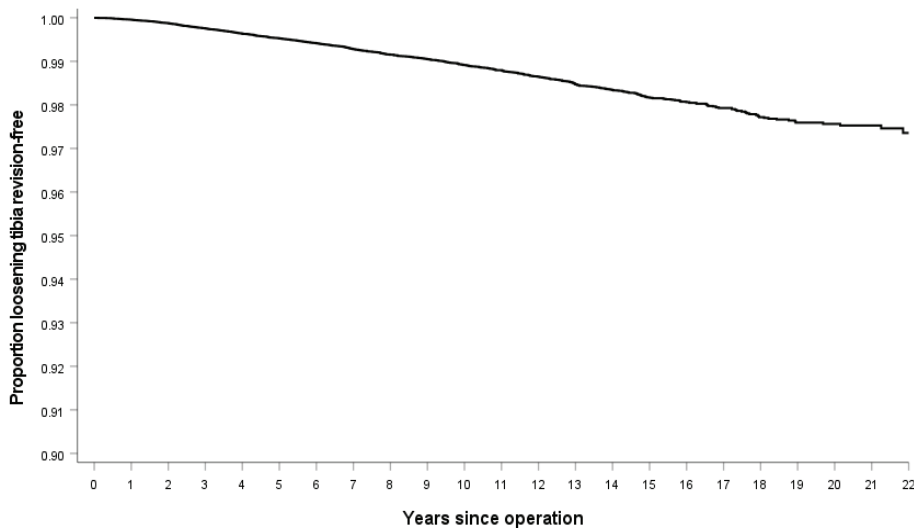


Survival by Surgeon Annual Output



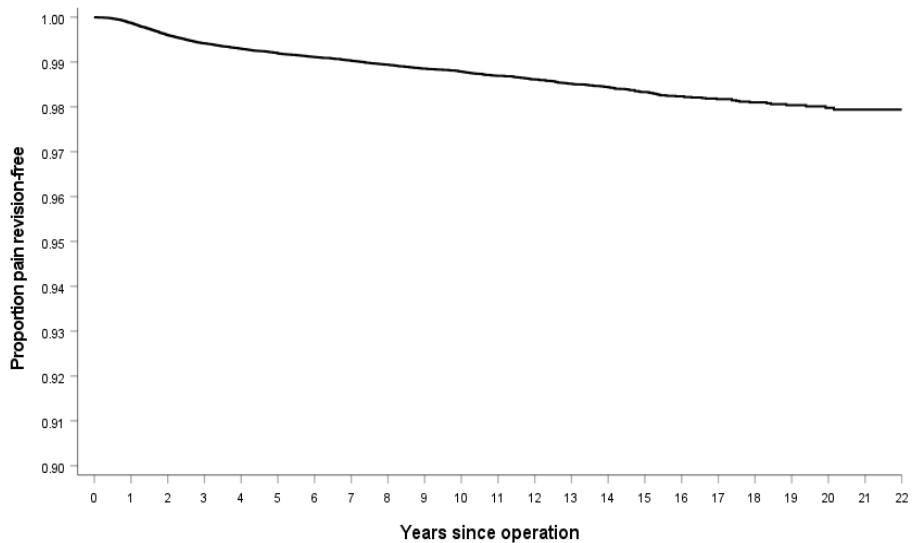
The following Kaplan Meier graphs are for the main individual reasons for revision:

Tibial loosening

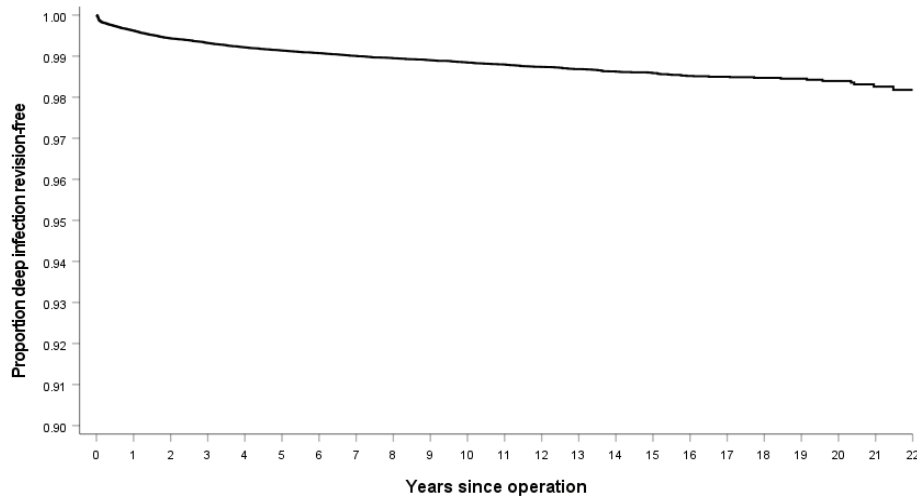




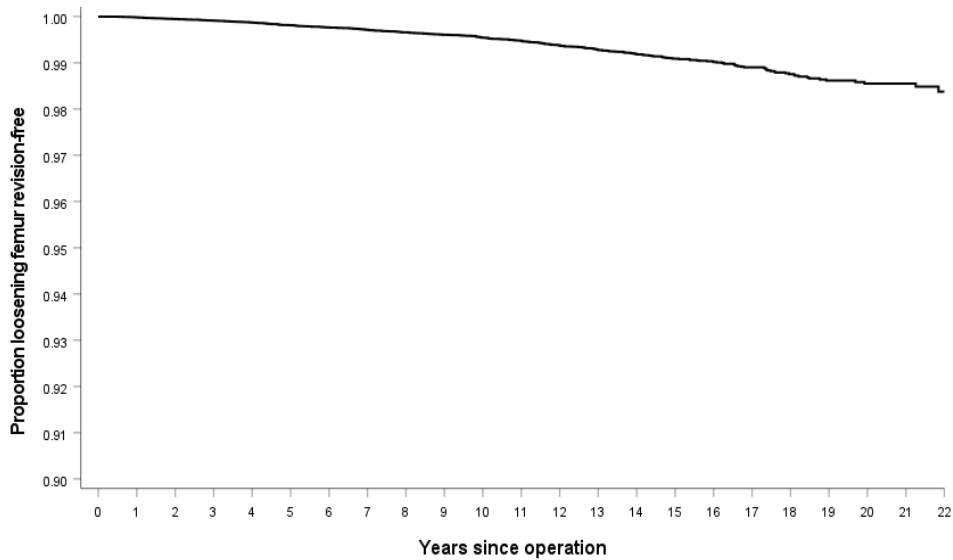
Pain



Deep infection



Femoral loosening



KNEE RE-REVISIONS

Analysis was undertaken of re-revisions. There were 783 registered total knee revisions that had been revised twice, 192 that had been revised three times, 50 that had been revised four times, 15 that had been revised five times and 4 that had been revised six times.

Second revision

Time between the first and second revision for the 783 knee arthroplasties averaged 2093 days (2.4 years), with a range of 14 – 7,758 and a standard deviation of 1,619 days. This compares to an average of 1,615 days (4.4 years) between primary and first revision knee arthroplasty.

Reason for revision	N
Deep infection	349
Pain	139
Loosening tibial component	93
Loosening femoral component	79
Loosening patellar component	11
Fracture femur	5
Fracture tibia	1

Third revision

There were 192 registered

Fourth revision

There were 50 registered

Fifth revision

There were 15 registered

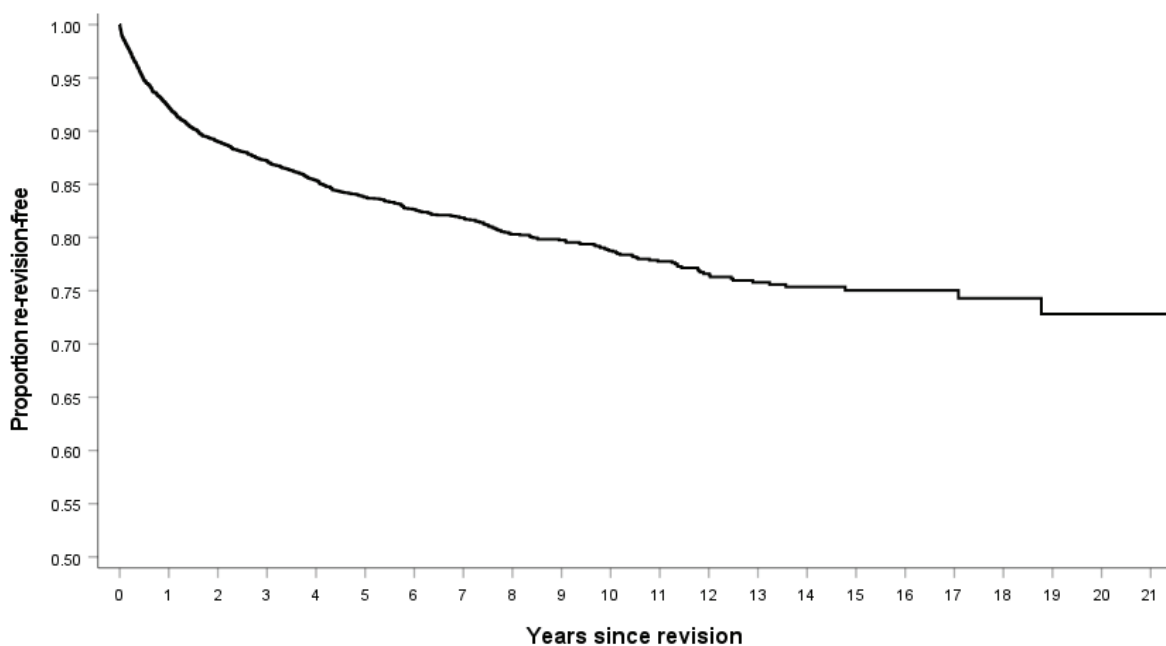
Sixth revision

There were 4 registered

Re-revisions for major and minor knee revisions

Re-revisions	No. Ops.	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Re-revisions	4838	26994.3	790	2.93	2.73	3.14

KAPLAN MEIER SURVIVAL CURVE FOR FIRST REVISION KNEE ARTHROPLASTIES





All Re-revisions

Years	% Re-revision free	Lower 95% CI	Upper 95% CI	N
1	92.26	91.49	93.03	4,040
2	89.06	88.15	89.97	3,516
3	87.22	86.22	88.21	3,068
4	85.38	84.30	86.45	2,645
5	83.80	82.66	84.95	2,244
6	82.66	81.45	83.87	1,883
7	81.86	80.61	83.12	1,556
8	80.31	78.95	81.67	1,292
9	79.77	78.37	81.18	1,079
10	78.77	77.27	80.26	863
11	77.77	76.17	79.37	688
12	76.60	74.85	78.35	523
13	75.80	73.93	77.67	401
14	75.37	73.42	77.32	289
15	75.04	72.99	77.08	210
16	75.04	72.99	77.08	153
17	75.04	72.99	77.08	111

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTHS, FIVE YEARS, TEN YEARS, FIFTEEN YEARS AND TWENTY YEARS POST-SURGERY

Questionnaires at six months post-surgery

At six months post-surgery a random selection of patients is sent the Oxford-12 questionnaire in order to achieve a response rate of 20% of the total which is deemed to be ample to provide powerful statistical analysis.

The scores range from 4 to 0. A score of 48 is the best, indicating normal function. A score of 0 is the worst, indicating the most severe disability.

In addition, we have grouped the questionnaire responses according to the classification system published by Kalairajah et al in 2005. (See appendix 1).

This groups each score into four categories:

Category	Score	Interpretation
Category 1	>41	Excellent
Category 2	34 – 41	Good
Category 3	27 – 33	Fair
Category 4	< 27	Poor

For the twenty-three-year period and as at July 2021, there were 29,942 primary knee questionnaire responses registered at six months post-surgery.

Score Group at 6 m	Revision to 2 years	No. revised	%	Std error	Revision 2 to 4 years	No. revised	%	Std error	Revision 4 to 6 years	No. revised	%	Std error
< 27	3,152	167	5.30	0.40	2,833	67	2.36	0.29	2,397	18	0.75	0.18
27-33	4,498	63	1.40	0.18	4,077	50	1.23	0.17	3,408	29	0.85	0.16
34-41	10,608	72	0.68	0.08	9,507	85	0.89	0.10	7,943	48	0.60	0.09
42+	11,684	49	0.42	0.06	10,479	38	0.36	0.06	8,550	41	0.48	0.07

Revision (%) to 2 years by Oxford score at 6 months





Revision (%) 2 to 4 years by Oxford score at 6 months



Questionnaires at five years post-surgery

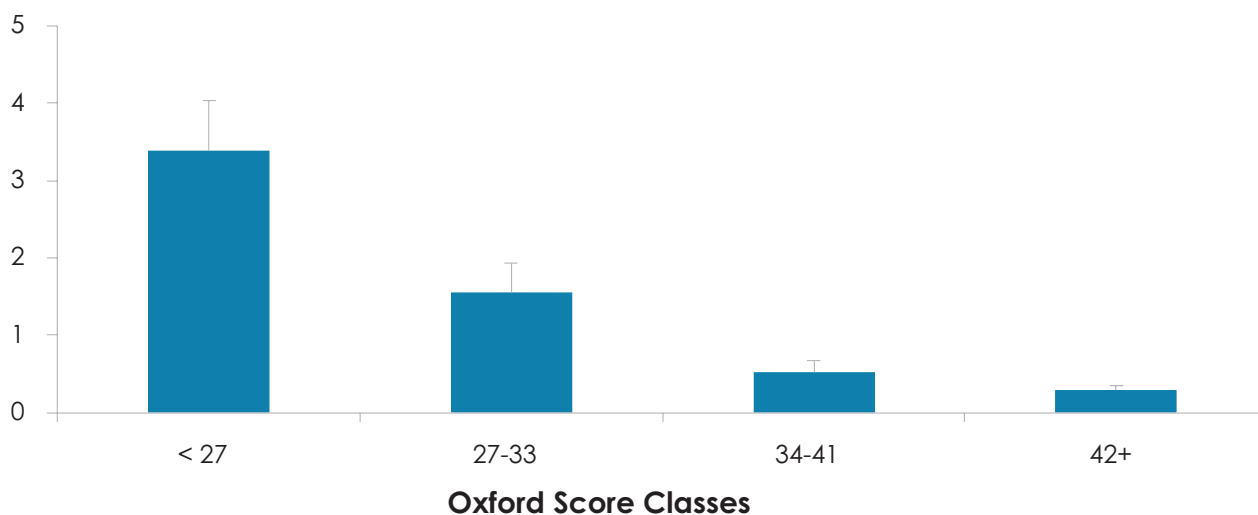
All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at five years post-surgery.

This dataset represents sequential Oxford knee scores for 11,508 individual patients.

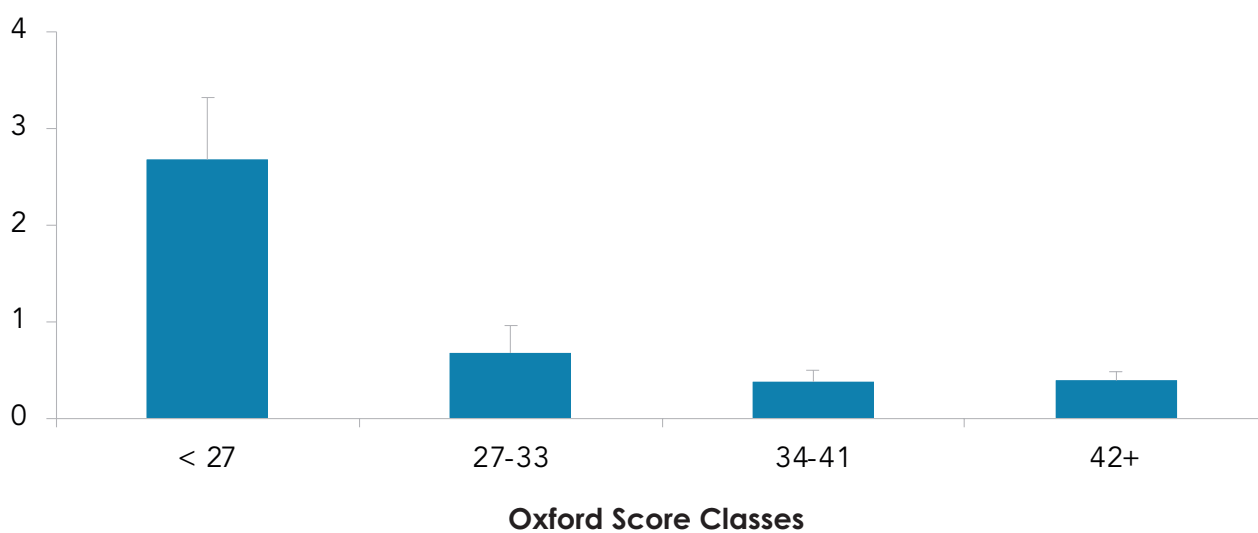
At five years post-surgery, 84% of patients achieved an excellent or good score and had an average of 40.60.

Score Group at Five Years	Revision to 2 years	No. revised	%	Std error
< 27	770	26	3.38	0.65
27-33	1,034	16	1.55	0.38
34-41	2,855	15	0.53	0.14
42+	6,849	19	0.28	0.06

Revision (%) to 2 years by Oxford score at 5 Years



Revision (%) to 2 to 4 years by Oxford score at 5 years



Score Group at 5 Years	Revision 2 to 4 years	No. revised	%	Std error
< 27	634	17	2.68	0.64
27-33	883	6	0.68	0.28
34-41	2,436	9	0.37	0.12
42+	5,865	23	0.39	0.08

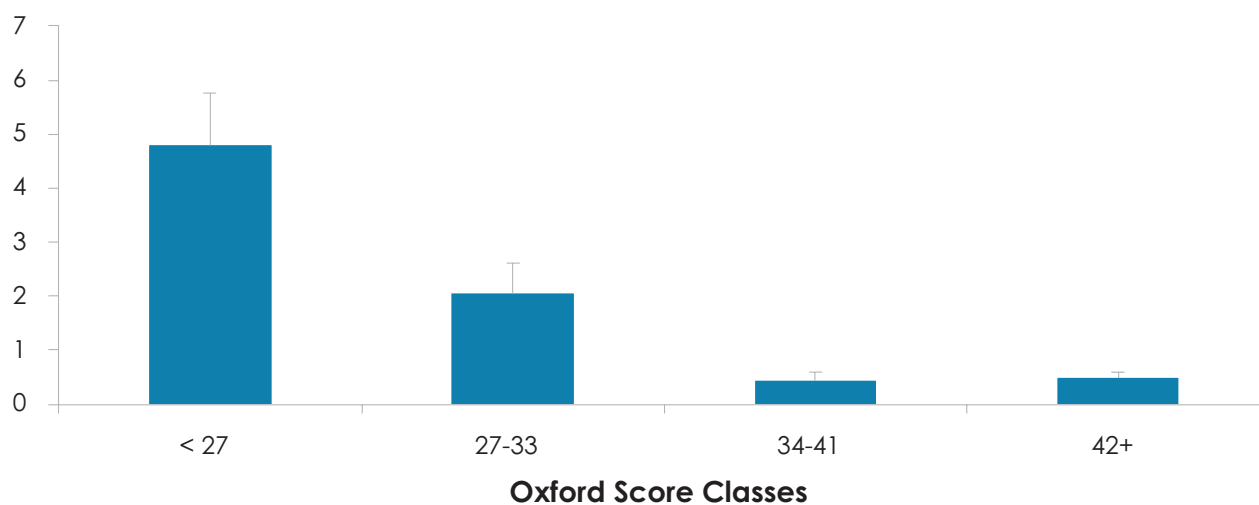


Questionnaires at ten years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at ten years post-surgery.

Score Group at 10 Years	Revision to 2 years	No. revised	%	Std error
< 27	500	24	4.80	0.96
27-33	637	13	2.04	0.56
34-41	1,590	7	0.44	0.17
42+	3,734	18	0.48	0.11

Revision (%) to 2 years by Oxford score at 10 Years



This dataset represents sequential Oxford knee scores for 6,461 individual patients.

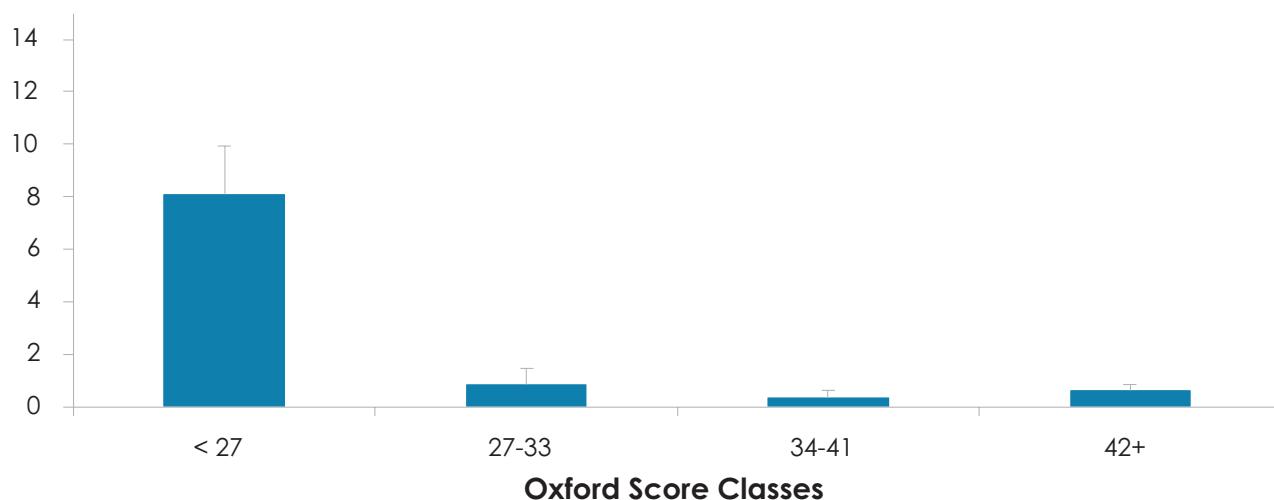
At ten years post-surgery, 82% of patients achieved an excellent or good score and had an average of 40.12.

Questionnaires at fifteen years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at fifteen years post-surgery.

Score Group at 15 Years	Revision to 2 years	No. revised	%	Std error
< 27	222	18	8.11	1.83
27-33	236	2	0.85	0.60
34-41	556	2	0.36	0.25
42+	1,269	8	0.63	0.22

Revision (%) to 2 years by Oxford score at 15 Years



This dataset represents sequential Oxford knee scores for 2,283 individual patients.

At fifteen years post-surgery, 80% of patients achieved an excellent or good score and had an average of 39.46.

Questionnaires at twenty years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at twenty years post-surgery.

This dataset represents sequential Oxford knee scores for 1, 042 individual patients.

At twenty years post-surgery, 801 (77%) of patients achieved an excellent or good score and had an average of 38.69.

Oxford Scores according to BMI Category

BMI (kg/m ²)	N	Mean	Std. Error of Mean
< 19	21	39.24	1.57
19 - 24	1,561	39.60	0.18
25 - 29	4,651	39.22	0.10
30 - 39	5,865	37.75	0.10
40+	9,24	35.69	0.27
Total	13,022	38.35	0.07

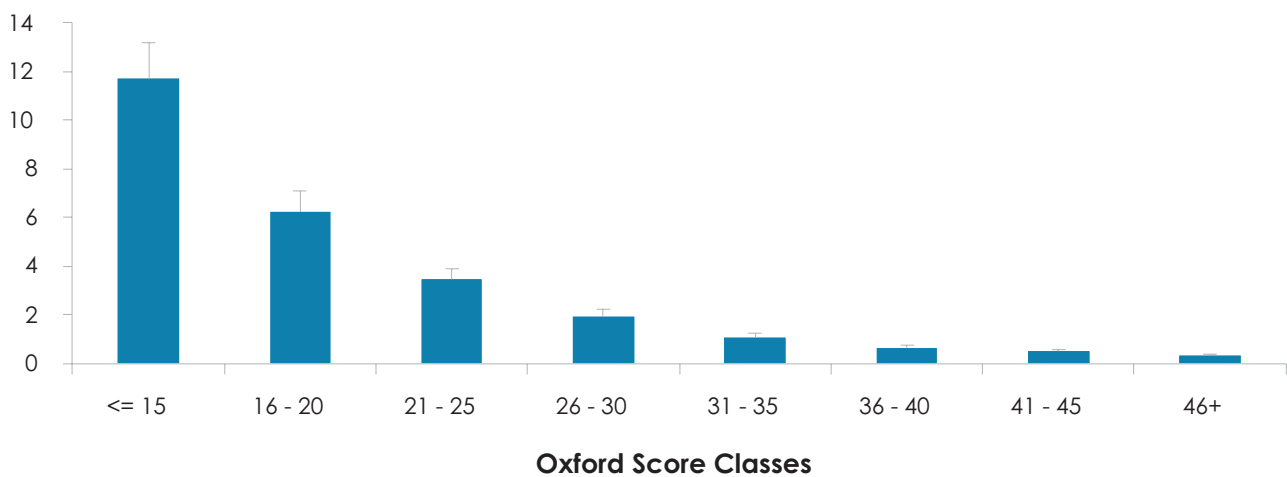


OXFORD 12 SCORE AS A PREDICTOR OF KNEE ARTHROPLASTY REVISION

In view of the large number of six-month Oxford scores it is possible with statistical significance to further break down the score groupings to demonstrate an even more convincing relationship between score and risk of revision within two years.

Score Group at 6 Months	Revision to 2 years	No. revised	%	Std error
<= 15	471	55	11.68	1.48
16 - 20	772	48	6.22	0.87
21 - 25	1,484	51	3.44	0.47
26 - 30	2,591	50	1.93	0.27
31 - 35	4,321	46	1.06	0.16
36 - 40	6,870	44	0.64	0.10
41 - 45	9,078	44	0.48	0.07
46+	4,355	13	0.30	0.08

Revision (%) to 2 years by Oxford score at 6 months

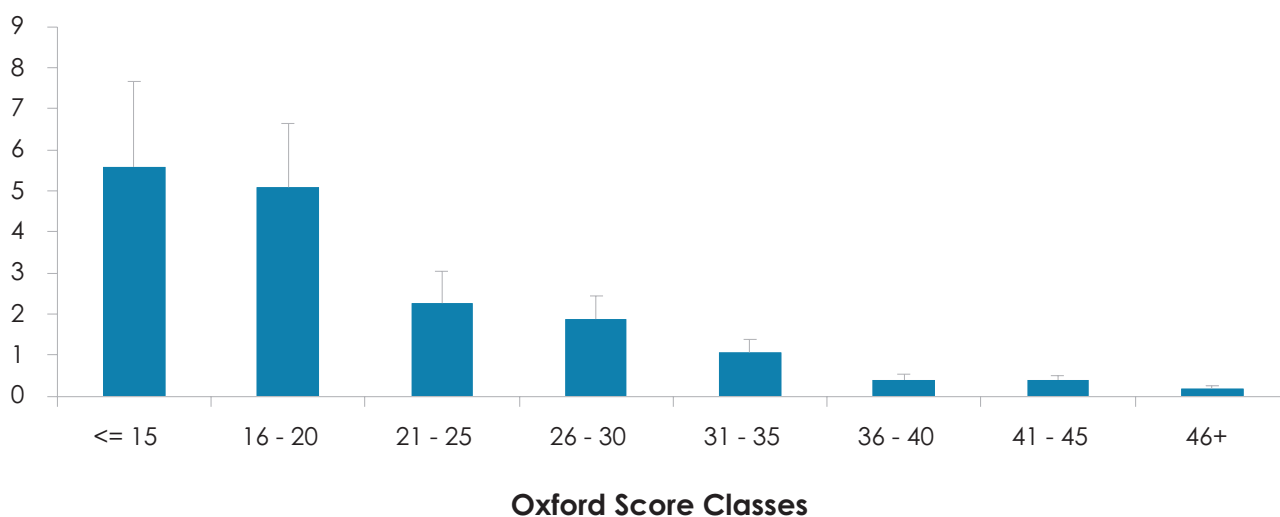


Five-year score and revision arthroplasty

As with the six-month scores, plotting the patients' five-year scores in the Kalairajah groupings against the proportion of knees revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 12 times the risk of a revision within two years compared to a person with a score > 42.

Score Group at 5 years	Revision to 2 years	No. revised	%	Std error
<= 15	125	7	5.60	2.06
16 - 20	197	10	5.08	1.56
21 - 25	354	8	2.26	0.79
26 - 30	583	11	1.89	0.56
31 - 35	1,037	11	1.06	0.32
36 - 40	1,772	7	0.40	0.15
41 - 45	3,872	15	0.39	0.10
46+	3,568	7	0.20	0.07

Revision (%) to 2 years by Oxford score at 5 years



Prediction of second revision from six-month score following first revision

Plotting the patients' six-month scores following their first revision in the Kalairajah groupings against the proportion of knees revised for that same group again demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 4 times the risk of a revision within two years compared to a person with a score >42.

Second Revisions

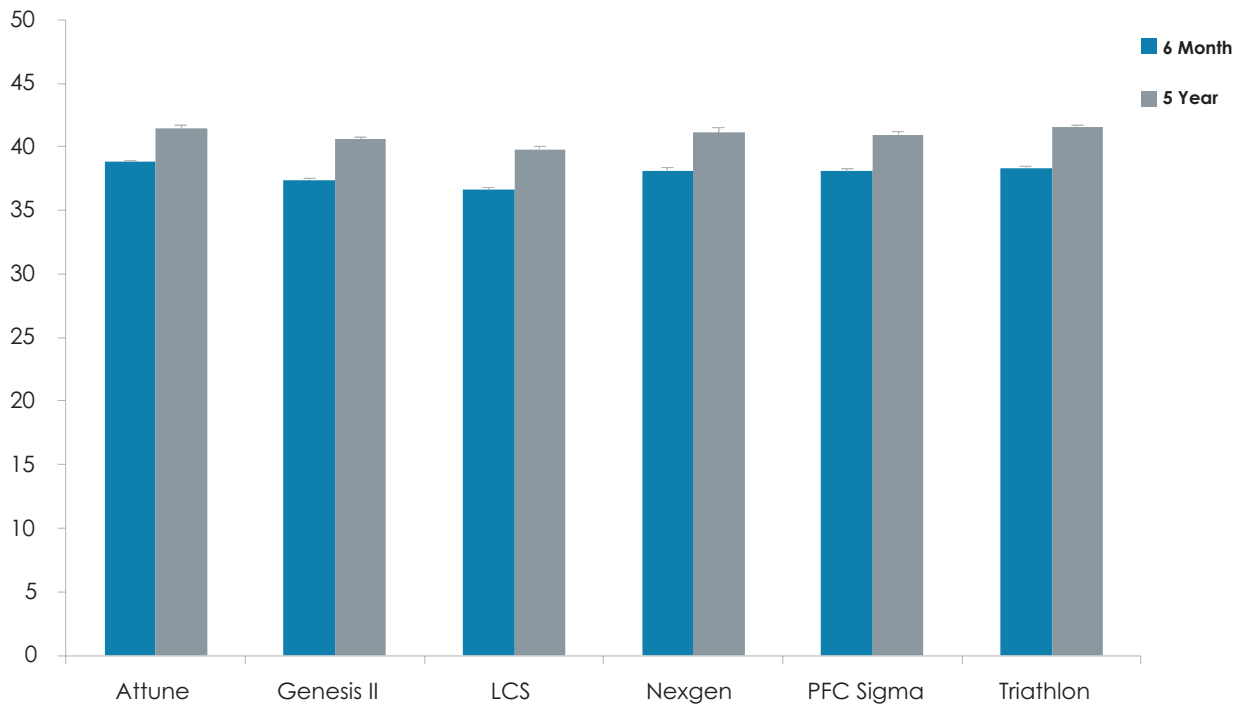
Score Group at 6 months	Revision to 2 years	No. revised	%	Std error
< 27	556	105	18.88	1.66
27_33	378	32	8.47	1.43
34_41	552	32	5.80	0.99
42+	423	16	3.78	0.93



Revision (%) to 2 years by Oxford score 6 months after first revision



Mean Oxford scores at six months and five years for six knee prostheses with minimum of 1,800 registrations



Oxford Score		Prosthesis					
		Attune	Genesis II	LCS	Nexgen	PFC Sigma	Triathlon
6 Month	Mean	38.8	37.4	36.6	38.1	38.1	38.4
	Std. Error of Mean	0.12	0.13	0.21	0.26	0.14	0.10
	N	3,571	3,605	1,623	943	2,985	5,653
5 Year	Mean	41.4	40.6	39.8	41.1	41.0	41.6
	Std. Error of Mean	0.29	0.17	0.28	0.34	0.18	0.15
	N	621	1,851	906	502	1,595	2,137

UNICOMPARTMENTAL KNEE ARTHROPLASTY

PRIMARY UNICOMPARTMENTAL KNEE ARTHROPLASTY

The data analysis is for the **twenty-two-year** period January 2000 – December 2021.

There were 15,878 unicompartmental knee procedures registered. There were 1,148 new procedures registered in 2021.

Data Analysis

This includes new form and legacy data.

Age and sex distribution

The average age for a unicompartmental knee replacement was 66 years, with a range of 18 – 95 years.

Total knee arthropasty	Female	Male
Number	7,132	8,746
Percentage	44.91	55.08
Mean age	65.91	66.23
Maximum age	94.71	94.55
Minimum age	18.28	30.98
Standard dev.	10.11	9.18

Age Groups (Years)	N
<55	2,030
55-64	5,384
65-74	5,412
>=75	3,052

Ethnicity	N
Asian	196
Euro/Other	14,764
Māori	490
NR	342
Pacifica	83

Environment

Operation Type	N
Cemented	9,063
Uncemented	6,139
Hybrid	676

Approach	N
Medial parapatellar	12,163
Lateral parapatellar	333

Surgical Adjuncts	N
Not Image guided	15,539
Image guided	339

Body Mass Index

For the twelve-year period 2010 - 2021, there were 10,418 BMI registrations for unicompartmental knee replacements. The average was 30.11 with a range of 15 – 60 and a standard deviation of 5.04.

Previous operation	N
None	13,020
Meniscectomy	2,214
Ligament reconstruction	100
Osteotomy	61
Internal fixation for juxtarticular fracture	41
Synovectomy	5

Diagnosis	N
Osteoarthritis	15,551
Avascular necrosis	135
Post ligament- disruption/reconstruction	77
Rheumatoid arthritis/other inflammatory	52
Post fracture	39
Tumour	2

Systemic antibiotic prophylaxis	N	%
Patient number receiving at least one systemic antibiotic	15,761	97%

Surgeons Attire

Surgeon Attire	N
Space Suits/Helmet Fan	3,508
One-piece Toga	195
Sterile Hood and Gown	155
Conventional Gown	880

ASA Class

This was introduced with the updated forms at the beginning of 2005.

For the sixteen- year period 2005 – 2021, there were 12,943 unicompartmental knee procedures with the ASA class recorded.

Definitions

- ASA class 1:** A healthy patient
ASA class 2: A patient with mild systemic disease
ASA class 3: A patient with severe systemic disease that limits activity but is not incapacitating
ASA class 4: A patient with an incapacitating disease that is a constant threat to life

ASA Class	Number	%
1	2,311	17
2	8,307	64
3	2,294	18
4	31	1



Hospitals & Environment

Operative time (skin to skin)

Operative time (skin to skin)	Duration
Average	71 minutes (SD 30.36)

Surgeon Attire	N
No suit	116,385
Suit	47,978

Surgeons Grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised.

The following figures are for the seventeen- year period 2005 – 2021 .

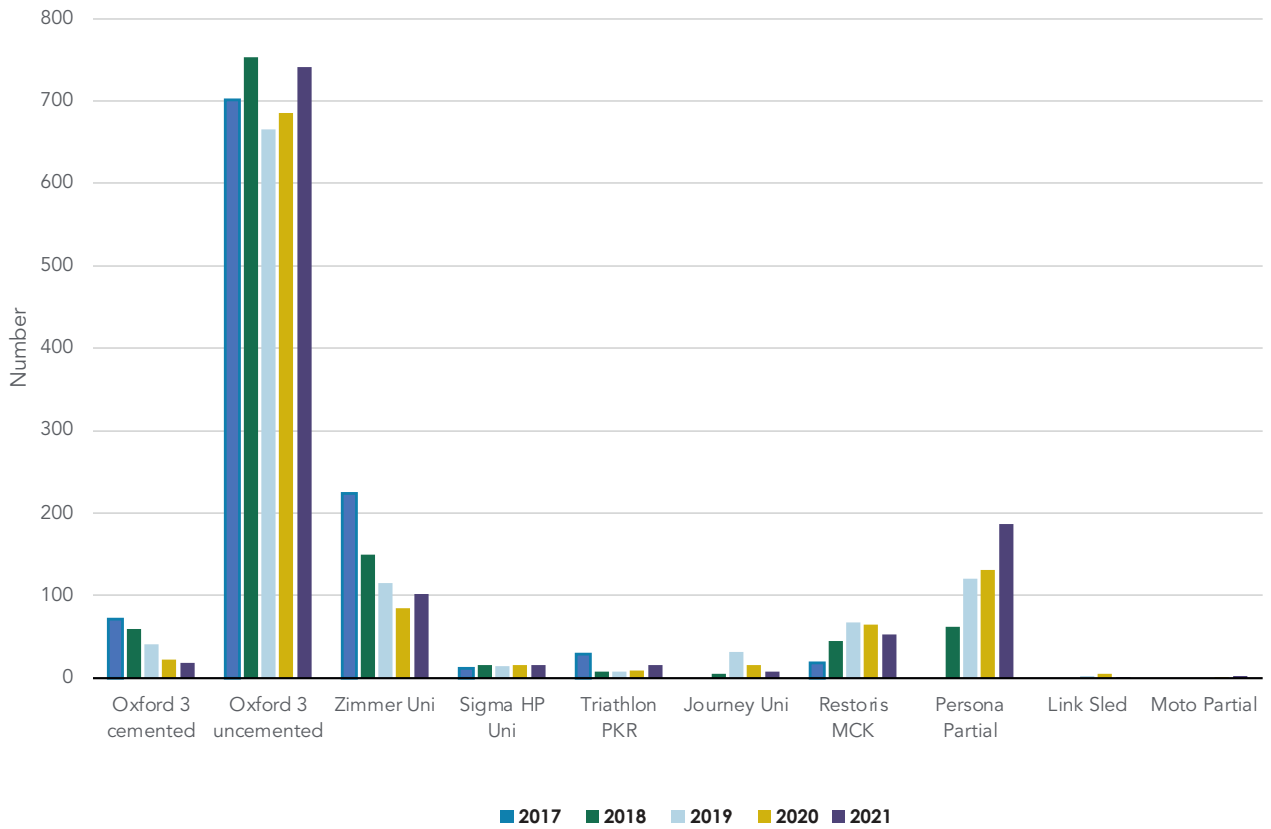
Grade	N
Consultant	15,004
Advanced trainee supervised	623
Advanced trainee unsupervised	107
Basic trainee	19

Prosthesis Usage

Unicompartmental knee prostheses used in registry

Prosthesis	N
Oxford 3 uncemented	6,707
Oxford 3 cemented	4,219
Zimmer Unicompartmental Knee	1,780
Miller/Galante	710
Persona Partial cemented	500
Preservation	484
Genesis Uni	359
Triathlon PKR	263
Restoris MCK	255

Most used Unicompartmental prostheses for 5 years (2017 – 2021)



Surgeon and hospital workload

Surgeons

In 2021, 88 surgeons performed 1,148 unicompartmental knee replacements, an average of 13 procedures per surgeon.

54 surgeons performed less than 10 procedures and 3411 surgeons performed greater or equal to 10 procedures.

Hospitals

In 2021, unicompartmental knee replacements were performed in 45 hospitals; 22 were public and 23 were private.



REVISION OF REGISTERED PRIMARY UNICOMPARTMENTAL ARTHROPLASTIES

This section analyses the data for revision of unicompartmental knee replacement over the twenty-two-year period.

There were 1371 revisions of the 15,878 registered unicompartmental knee replacements.

A further 153 had a second revision, 19 a third revision and 1 a fourth revision.

1,090 of 1,358 were revised to total knee replacements and 268 a further revision to unicompartmental knees.

Time to revision	N	Reason for revision	N
Average	2,297 days (6.3 year)	Unexplained pain	373
Maximum	7,671 days	Loosening tibial component	218
Minimum	1 day	Loosening femoral	156
Standard deviation	1,877 days	Deep infection	53
		Fracture tibia	40
		Fracture femur	7

Analysis of the three main reasons for revision by year after the primary procedure

Years	Loosening femoral component		Loosening tibial component		Pain	
	Count	%	Count	%	Count	%
0	13	8.3	38	17.4	49	13.1
1	26	16.7	42	19.3	84	22.5
2	10	6.4	19	8.7	40	10.7
3	17	10.9	17	7.8	18	4.8
4	5	3.2	10	4.6	35	9.4
5	11	7.1	9	4.1	18	4.8
6	5	3.2	13	6.0	21	5.6
7	11	7.1	9	4.1	18	4.8
8	9	5.8	8	3.7	14	3.8
9	8	5.1	12	5.5	15	4.0
10	8	5.1	6	2.8	15	4.0
11+	33	21.2	35	16.1	46	12.3
Total	156		218		373	

All Primary Unicompartmental Knee Arthroplasties

N	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
15,878	119851.3	1,371	1.1439	1.08	1.21

Revision Rate of Individual Unicompartmental Knee Prostheses Sorted Alphabetically

Prosthesis	N	Sum comp. years	Events	Rate/100-component years	Lower 95% CI	Upper 95% CI
EIUS Uni Knee	22	276.4	3	1.09	0.22	3.17
Freedom Active Uni	36	255.3	8	3.13	1.35	6.17
Genesis Uni	359	4331.0	57	1.32	1.00	1.71
HLS Uni Evolution	1	0.5	1	193.25	4.89	1076.74
Journey Uni	66	155.8	5	3.21	1.04	7.49
LCS Uni	6	64.0	2	3.12	0.38	11.29
Link Sled	8	11.4	0	0.00	0.00	32.30
Miller/Galante	710	9231.6	89	0.96	0.77	1.19

Moto Partial Knee	3	1.8	1	55.09	1.39	306.94
Nexgen CR-Flex cemented	1	0.9	0	0.00	0.00	396.28
Optetrak Unicondylar Cemented	101	1059.9	11	1.04	0.52	1.86
Oxford 3 cemented	4,219	47696.6	654	1.37	1.27	1.48
Oxford 3 uncemented	6,707	34375.5	298	0.87	0.77	0.97
Oxford TiNbn coated	2	11.9	0	0.00	0.00	31.12
Oxinium Uni	33	332.9	12	3.60	1.86	6.30
Persona Partial cemented	500	784.8	10	1.27	0.57	2.26
Pres3ervation	484	5873.1	100	1.70	1.38	2.06
Repicci II	98	1322.1	26	1.97	1.25	2.84
Restoris MCK	255	531.6	6	1.13	0.41	2.46
Sigma cemented	1	0.2	0	0.00	0.00	1663.41
Sigma HP Uni	204	1155.5	9	0.78	0.36	1.48
Triathlon cemented	3	0.5	0	0.00	0.00	705.43
Triathlon PKR	263	1681.8	14	0.83	0.46	1.40
Triathlon uncemented	1	0.9	0	0.00	0.00	426.38
Unix Uni	14	113.4	3	2.64	0.55	7.73
Zimmer Unicompartmental Knee	1,780	10581.2	62	0.59	0.45	0.75

Oxford 3 uncemented	N	Sum comp. years	Events	Rate/100-component years	Lower 95% CI	Upper 95% CI
Not Lateral Domed	6,376	32154.1	255	0.79	0.70	0.90
Oxford 3 Lateral Domed	331	2221.5	43	1.94	1.40	2.61

Revision vs Arthroplasty Fixation

Fixation	No. Ops	Observed component years	Number revised	Rate/100	Lower 95% CI	Upper 95% CI
Cemented	9,063	84798.3	1,063	1.25	1.18	1.33
Uncemented	6,139	31050.1	248	0.80	0.70	0.90
Hybrid	676	4002.9	60	1.50	1.14	1.93



Revision vs Age Bands

Age Groups	No. Ops	Observed component years	Number revised	Rate/100	Lower 95% CI	Upper 95% CI
<55	2,030	15720.3	289	1.84	1.63	2.06
55-64	5,384	43124.9	614	1.42	1.31	1.54
65-74	5,412	41089.4	339	0.83	0.74	0.92
>=75	3,052	19916.6	129	0.65	0.54	0.77

Revision vs Gender

Sex	No. Ops	Observed component years	Number revised	Rate/100	Lower 95% CI	Upper 95% CI
F	7,132	55995.0	708	1.26	1.17	1.36
M	8,746	63856.2	663	1.04	0.96	1.12

Revision by Ethnicity

Ethnicity	No. Ops	Observed component years	Number revised	Rate/100 component years	Lower 95% CI	Upper 95% CI
Asian	196	1253.8	9	0.72	0.33	1.36
Euro/Other	14,764	110945.2	1297	1.17	1.11	1.23
Māori	490	3339.6	42	1.26	0.91	1.70
Not Recorded	342	3698.7	18	0.49	0.29	0.77
Pacifica	83	613.6	5	0.81	0.22	1.79

Revision vs Surgeon Annual Workload

Consultant No. of ops/year	No. Ops.	Observed component years	Number revised	Rate/100 component-years	Exact 95% confidence interval	
<10	5,973	51840.4	687	1.33	1.23	1.43
>=10	9,903	67996.4	683	1.00	0.93	1.08

Revision vs. Surgical Approach

Surgical Approach	No. Ops.	Observed component years	Number revised	Rate/100 component years	Lower 95%CI	Upper 95%
Medial parapatellar	12,163	90583.4	1,082	1.19	1.12	1.27
Lateral parapatellar	333	2601.4	44	1.69	1.23	2.27

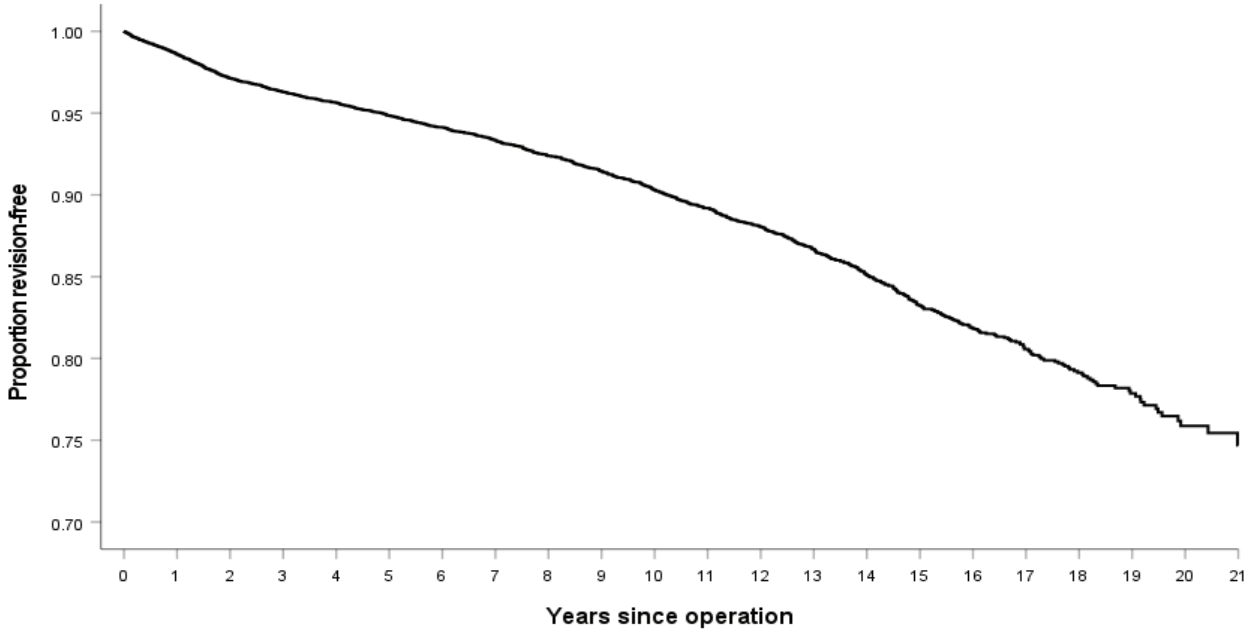
Revision Rate for Re-revisions

Re-revision	No. Ops.	Observed component years	Number revised	Rate/100 component years	Lower 95%CI	Upper 95%
Revised to full	1,085	7028.3	98	1.39	1.13	1.70
Revised to Uni	273	1325.2	75	5.66	4.45	7.09
All	1,358	8353.6	173	2.07	1.77	2.40

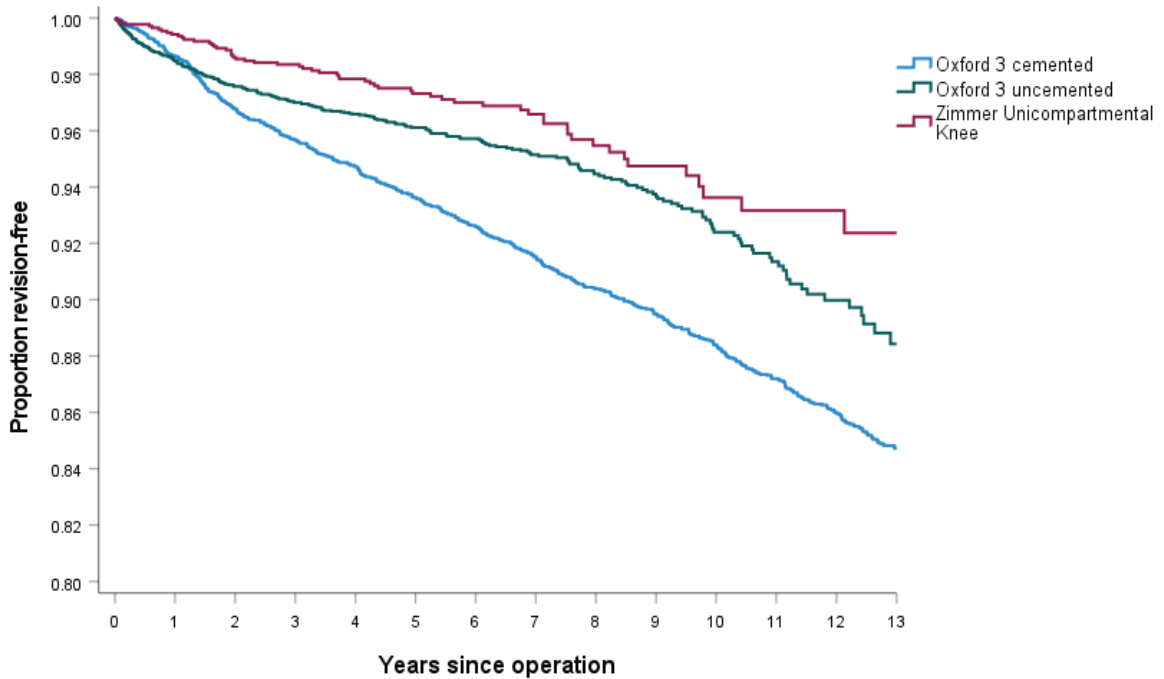
KAPLAN MEIER CURVES

The following Kaplan Meier survival analyses are for the 21 years from 2000 to 2021, with deceased patients censored at time of death.

Unicompartmental Knees

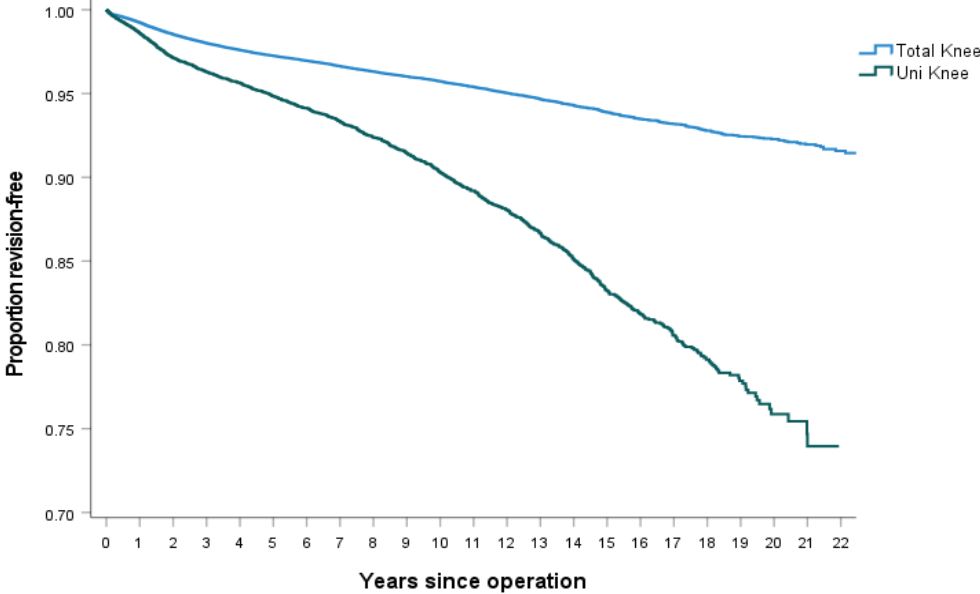


Survival curves for the top 3 Unicompartmental knee prostheses excluding lateral domed Oxford 3 uncemented





Unicompartmental vs Total Knees



	No. Ops	Observed component years	Number Revised	Rate/100 component-years	Exact 95% confidence interval	
Total Knees	135,698	1039769.3	4,838	0.4653	0.45	0.48
Uni Knees	15,878	119851.3	1,371	1.1439	1.08	1.21

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTHS, FIVE YEARS, TEN YEARS, FIFTEEN YEARS AND TWENTY YEARS POST-SURGERY

Questionnaires at six months post-surgery

At six months post-surgery a random selection of patients are sent the Oxford-12 questionnaire in order to achieve a response rate of 20% of the total which is deemed to be ample to provide powerful statistical analysis.

A score of 48 is the best, indicating normal function. A score of 0 is the worst, indicating the most severe disability.

In addition, we have grouped the questionnaire responses according to the classification system published by Kalairajah et al in 2005. (See appendix 1).

This groups each score into four categories:

Category	Score	Interpretation
Category 1	>41	Excellent
Category 2	34 – 41	Good
Category 3	27 – 33	Fair
Category 4	< 27	Poor

For the twenty-two-year period and as at July 2022, there were 8,413 unicompartmental knee questionnaire responses registered at six months post-surgery. At 6 months post-surgery, 84% of patients achieved an excellent or good score.

The average was 39.9, range 3 to 48, and the standard deviation was 7.12.

Score Group at 6 months	Revision to 2 years	No. revised	%	Std error
> 41	4,375	40	0.91	0.14
34-41	2,665	33	1.24	0.21
27-33	871	36	4.13	0.67
0_26	502	93	18.53	1.73

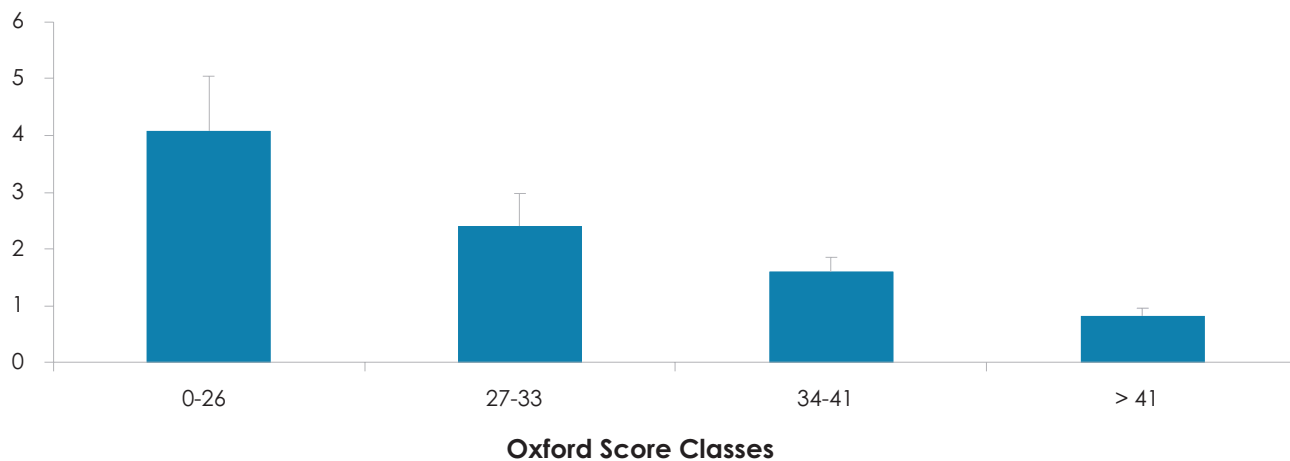
Revision (%) to 2 years by Oxford score at 6 months



Score Group at 6 months	Revision 2 to 4 years	No. revised	%	Std error
> 41	3,567	29	0.81	0.15
34-41	2,199	35	1.59	0.27
27-33	747	18	2.41	0.56
0-26	417	17	4.08	0.97



Revision (%) 2 to 4 years by Oxford score at 6 months



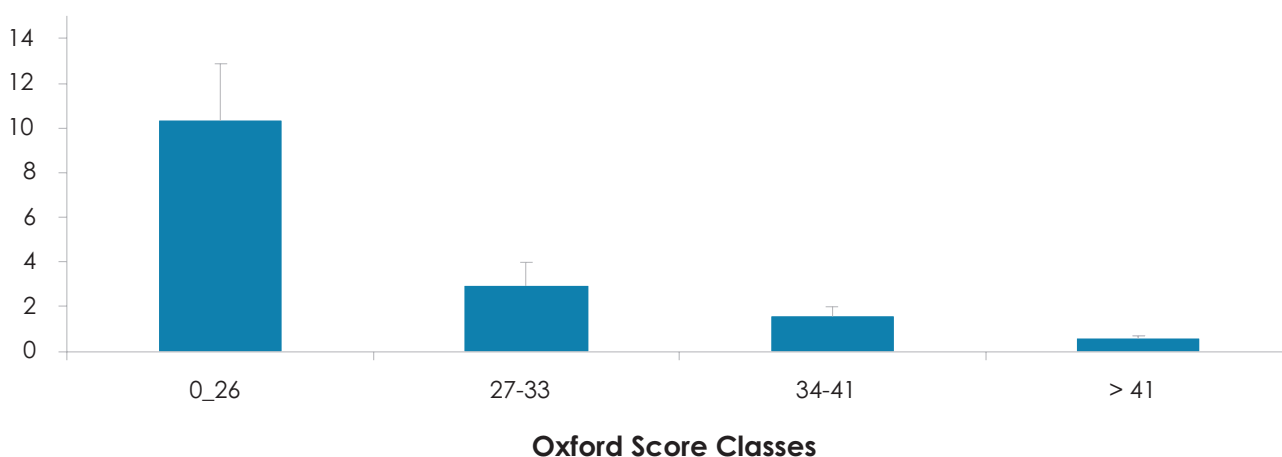
Questionnaires at five years post surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at five years post-surgery. There were 3,365 unicompartmental knee questionnaire responses registered at five years post-surgery.

At five years post-surgery, 89% of patients achieved an excellent or good score. The average was 41.74, range 5 to 48, and the standard deviation was 6.79.

Score Group at 5 years	Revision to 2 years	No. revised	%	Std error
0-26	145	15	10.34	2.53
27-33	240	7	2.92	1.09
34-41	783	12	1.53	0.44
> 41	2,197	12	0.55	0.16

Revision (%) to 2 years by Oxford score at 5 Years



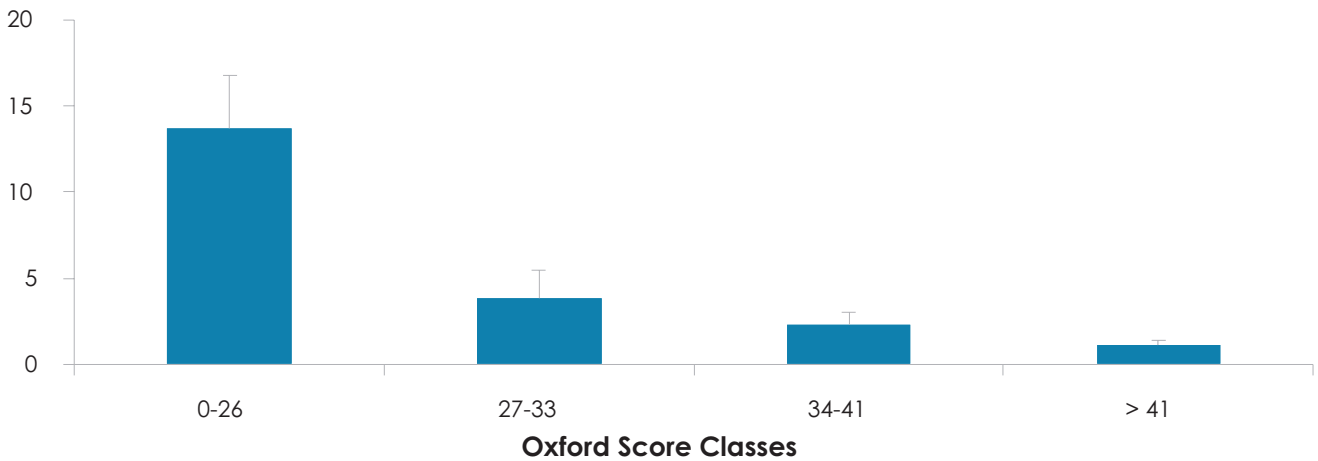
Questionnaires at ten years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at ten years post-surgery. There were 1,748 unicompartmental knee questionnaire responses registered at ten years post-surgery.

At ten years post-surgery, 84% of patients achieved an excellent or good score. The average was 41.82, range 5 to 48, and the standard deviation was 7.85.

Score Group at 10 years	Revision to 2 years	No. revised	%	Std error
> 41	1,078	12	1.11	0.32
34-41	391	9	2.30	0.76
27-33	155	6	3.87	1.55
0_26	124	17	13.71	3.09

Revision (%) to 2 years by Oxford score at 10 Years



ANKLE ARTHROPLASTY

PRIMARY ANKLE ARTHROPLASTY

The **twenty-three-year** report analyses data for the period January 2000 – December 2021. There were 2,016

primary ankle procedures registered. This is an addition of 139 compared to last year's report.

Data Analysis

Data analysis includes new form and legacy data. The original data set collection commenced in 2000 and relates to all 2,016 implants in the registry. With data form modifications over time additional data relating to subsets of the cohort have also been collected. The new 2005 form additionally collected ASA and registrar primary surgeon supervision data. In 2010 BMI was added.

In November 2020 significantly revised forms were introduced for primary and revision procedures. They can be found in the appendices. The primary form added new categories for previous operations, diagnosis, X-ray alignment, concurrent surgery, approach including technologies assisting implant insertion and surgeon attire. The revision form added a wider range of categories for diagnosis. Pain was replaced with 'pain without obvious cause'. Further categories were added for revision procedure and re-operation procedure.

In this report data from the new and the legacy forms have been grouped together for analysis. There have been 143 new ankles registered using the new form.

Age and sex distribution

The average age for an ankle replacement was 66.7 years, with a range of 32.3 – 95.5 years.

Total ankle arthropasty	Female	Male
Number	792	1,224
Percentage	39.29	60.71
Mean age	64.67	67.99
Maximum age	95.52	91.78
Minimum age	32.32	33.42
Standard dev.	9.82	8.40

Age Groups (years)	N
<55	196
55-64	613
65-74	836
>=75	371

Ethnicity	N
Asian	20
Euro/Other	1,874
Māori	58
Not Recorded	39
Pacifica	25

Patient ethnicity data has been newly added in this year's report. It was obtained from the national NHI dataset by correlation with the registry's patient identification data.

Body Mass Index

For the twelve-year period 2010 - 2021, there were 951 BMI registrations for primary ankle replacements. The average was 29 kg/m² with a range of 17 – 54.

Previous operation	N
None	1,606
Internal fixation for juxta- articular fracture	178
Arthrodesis	48
Osteotomy	25
Total in data set	2,016

Diagnosis	N
Osteoarthritis	1,527
Rheumatoid arthritis/other inflammatory	165
Avascular necrosis	11
Post fracture	29
Total in data set	2,016

X-Ray	N
Concentric or mild deformity	86
>10 degrees varus	22
>10 degrees valgus	13
Total in data set	143

Data on X-ray alignment has only been collected since the introduction of the new forms in November 2020. There are 143 new ankles registered using the new form.

Concurrent surgery	N
Achilles or calf lengthening	35
Ligament reconstruction – lateral	16
Midfoot fusion or osteotomy	12
Total in data set	143

Details on concurrent surgery have only been collected since the introduction of the new forms in November 2020. There are 143 new ankles registered using the new form.

Approach	N
Anterior	1,680
Lateral	29
Patient specific instrumentation	11
Total in data set	2,016

Systemic antibiotic prophylaxis	N	%
Patient number receiving at least one systemic antibiotic	1, 998	99.1%

Surgeons & Environment

Operating theatre	N
Conventional	1,012
Laminar flow	985
Total in data set	2,016

Surgeon Attire	N
Space suits/Helmet Fan	383
One-piece Toga	16
Sterile Hood and Gown	16
Conventional Gown	1,601
Total in data set	2,016

ASA Class

This was introduced with the updated forms at the beginning of 2005.

For the sixteen- year period 2005 -2020, there were 1,599 primary ankle procedures with the ASA class recorded.

Definitions

ASA Class	ASA Definition	N
1	A healthy patient	299
2	Mild systemic disease	1,090
3	Moderate systemic disease	342
4	Incapacitating systemic disease	6

ASA Class	N
1	299
2	1,090
3	342
4	6

Operative time (skin to skin)

Operative time (skin to skin)	Duration
Mean	122 minutes
Range	0-436 minutes
Standard deviation	44.2

Surgeon and hospital workload

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the seventeen-year period 2005 -2021.

Grade	N
Consultant	1,926
Advanced trainee supervised	15

Surgeons

In 2021, 21 surgeons performed 139 primary ankle procedures. 6 surgeons performed 10 or more procedures and 15 performed less than 10 procedures.

Hospitals

In 2021, primary ankle replacement was performed in 23 hospitals. 10 were public and 13 were private.

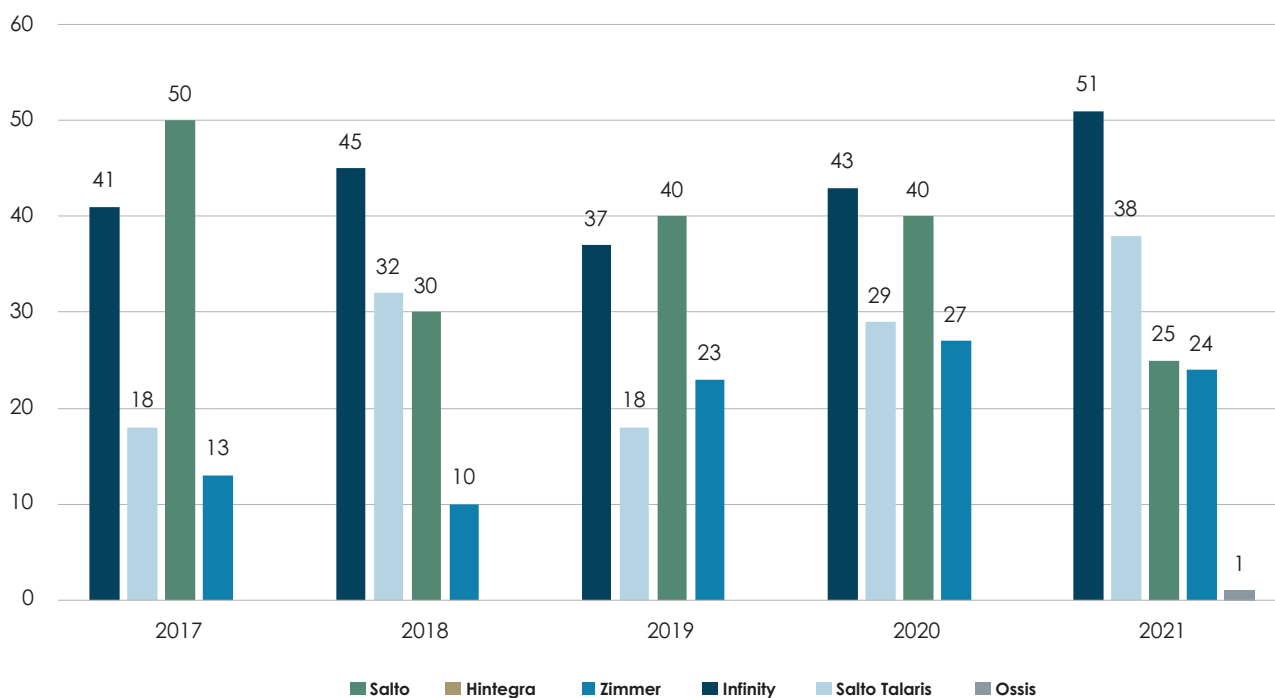
Ankle Prostheses used in 2021

Prosthesis	N
Infinity	51
Salto Talaris	38
Salto	25
Zimmer TM	24

The four implants used in 2021 are the only implants that have been in use since the start of 2017. The Salto is the oldest design remaining in use and has a mobile bearing. It has been in use in New Zealand since 2005. The Salto Talaris is based on the Salto but has a fixed bearing and has been in use in NZ since 2014. The Zimmer TM is a fixed bearing implant with highly crosslinked polyethylene implanted through a lateral approach with fibular osteotomy and has been in use in NZ since 2014. The Infinity is a fixed bearing implant used in NZ since 2015.



MOST USED ANKLE PROSTHESES 2016 – 2020



REVISION ANKLE ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced ankle joint, during which one or more of the components are exchanged, removed, manipulated or added. Procedures where all components are removed are recorded as revisions (e.g., ankle fusion post failed ankle replacement, removal of components and insertion of a cement spacer for infection, or amputation). It does not include soft tissue procedures or bony debridement without component changes are included in the category referred to as reoperation.

Data analysis

For the twenty-two-year period January 2000–December 2021, there were 285 revision ankle procedures registered. The average age for an ankle revision was 66 years, with a range of 35 – 85.

REVISION OF REGISTERED PRIMARY ANKLE ARTHROPLASTIES

All Primary Ankle Arthroplasties

No. Ops.	Sum comp. years	Number Revised	Rate/100-component-years	Exact 95% CI	
2,016	14143.8	225	1.5908	1.39	1.81

This section analyses data for revisions of primary ankle procedures for the twenty-two-year period 2000 – 2021. There were 225 revisions of the 2016 primary total ankle procedures registered.

There was no difference in average age at revision, compared to the average age at primary arthroplasty.

Revision by Gender

Sex	No. Ops	Sum comp. years	Number revised	Rate/100	Lower 95% CI	Upper 95% CI
Females	792	5661.9	91	1.61	1.29	1.96
Males	1,224	8481.9	134	1.58	1.32	1.86

Revision vs Age Bands

Age Groups	No. Ops	Sum comp. years	Events	Rate/100 component-years	Exact 95% confidence interval	
<55	196	1551.9	40	2.58	1.81	3.47
55-64	613	4758.6	106	2.23	1.82	2.69
65-74	836	5726.4	70	1.22	0.95	1.54
>=75	371	2106.9	9	0.43	0.20	0.81

Revision by Ethnicity

Ethnicity	No. Ops	Sum comp. years	Events	Rate/100	Lower 95% CI	Upper 95% CI
Asian	20	144.0	3	2.08	0.43	6.09
Euro/Other	1,874	13115.2	207	1.58	1.37	1.80
Māori	58	345.7	5	1.45	0.47	3.37
Not Recorded	39	379.4	4	1.05	0.29	2.70
Pacifica	25	159.5	6	3.76	1.38	8.19



Analysis of the four main reasons for revision by year after primary procedure

Years since operation	Loosening talar component		Loosening tibial component		Pain*		Deep Infection	
	Count	%	Count	%	Count	%	Count	%
0	3	4.9	3	6.7	5	5.6	9	42.9
1	7	11.5	13	28.9	16	18.0	3	14.3
2	8	13.1	3	6.7	11	12.4	2	9.5
3	9	14.8	3	6.7	11	12.4	3	14.3
4	9	14.8	5	11.1	14	15.7	1	4.8
5	5	8.2	2	4.4	6	6.7	0	0.0
6	4	6.6	3	6.7	5	5.6	0	0.0
7	3	4.9	2	4.4	5	5.6	1	4.8
8	2	3.3	4	8.9	5	5.6	0	0.0
9	4	6.6	2	4.4	4	4.5	0	0.0
10	2	3.3	2	4.4	3	3.4	0	0.0
11+	5	8.2	3	6.7	4	4.5	2	9.5
Total	61		45		89		21	

*Not collected 2021, it was replaced in the new data forms in November 2021 with 'pain with no obvious cause'.

Time to revision	Days	Reason for revision	N
Average	1,835 (5.0 years)	Pain	89
Maximum	5,670	Loosening talar component	61
Minimum	21	Loosening tibial component	45
Standard deviation	1,330	Deep infection	21
		Dislocation	4
		Fracture talus	3

Revision vs Prosthesis Type from lowest to highest revision rate

Prosthesis	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Salto Talaris	183	579.6	1	0.17	0.00	0.96
Zimmer TM	109	249.5	2	0.80	0.10	2.90
Infinity	242	634.6	6	0.95	0.35	2.06
Salto	826	5874.6	83	1.41	1.13	1.75
Mobility	450	4566.7	73	1.60	1.25	2.01
STAR	47	507.0	12	2.37	1.22	4.13
Agility	119	1422.0	36	2.53	1.77	3.50
Hintegra	22	148.4	4	2.70	0.73	6.90
Ramses	11	112.7	5	4.43	1.44	10.35
Box	6	47.8	3	6.27	1.29	18.33

Ankle re-revisions

There were 23 registered primary ankle procedures that were revised twice and 2 procedures that were revised three times

KAPLAN MEIER CURVES

The following Kaplan Meier survival analyses are for the 22 years from 2000 to 2021, with deceased patients censored at time of death.



Years	% Revision-free	No in each year
1	98.8	1,840
2	97.1	1,661
3	95.4	1,498
4	93.6	1,336
5	91.9	1,177
6	90.8	1,038
7	89.4	914
8	88.1	807
9	86.7	685
10	84.7	578
11	83.5	476
12	81.5	368
13	80.9	271
14	79.4	187
15	79.0	135
16	78.3	87
17	78.3	52
18	78.3	27

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTHS POST-SURGERY

At six months post-surgery patients are sent an outcome questionnaire.

The non -validated ankle questionnaire used previously by the Registry was replaced by the validated Manchester-Oxford Foot Questionnaire towards the end of 2015.

This has 16 questions answered on a 5- point Likert scale, with each item scoring from 0 – 4, with 4 denoting "most severe". Total score ranges from 0-64, 0 is best possible, 64 is worst possible outcome.

For the 6-year period 2016 – 2021 there were 416 responses with the following summary statistics:

Average	18.89
Standard deviation	14.70
Maximum	60
Minimum	0

SHOULDER ARTHROPLASTY

PRIMARY SHOULDER ARTHROPLASTY

The **twenty-two-year** report analyses data for the period January 2000 – December 2021. There were 1137 new registrations in 2021.

New data forms introduced in October 2020 now have 3 categories of shoulder replacement.

These are total shoulder with 4363 registered, reverse with 7,277 registered and hemiarthroplasty with 2,171 registered.

The previous category of resurfacing head has been updated to total shoulder and partial resurfacing has been updated to hemiarthroplasty. The 1 humeral sphere has been updated to hemiarthroplasty.

Data Analysis

Data form analysis includes new form and legacy data.

Age and sex distribution

The average age for all patients with a shoulder arthroplasty was 71 years, with a range of 15 – 99 years.

Total Shoulder	Female	Male
Number	2,621	1,742
Percentage	60.07	69.93
Mean age	69.51	65.06
Maximum age	95.43	89.11
Minimum age	26.64	23.67
Standard dev.	8.72	9.01

Reverse shoulder	Female	Male
Number	4,501	2,776
Percentage	61.85	38.15
Mean age	74.97	72.04
Maximum age	96.81	94.32
Minimum age	35.61	20.61
Standard dev.	7.74	7.82

Hemiarthroplasty	Female	Male
Number	1,316	855
Percentage	60.60	39.40
Mean age	70.07	61.91
Maximum age	97.71	99.35
Minimum age	15.02	19.09
Standard dev.	12.21	13.23

Data analysis by Shoulder Arthroplasty Type

Previous operation	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
None	3,931	5,824	1,737
Rotator cuff repair	75	942	68
Internal fixation for Juxta articular fracture	52	157	95
Previous stabilisation	101	106	79
Arthroscopic debridement	42	55	15

Diagnosis	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Osteoarthritis	3,771	2,629	848
Rheumatoid arthritis/other inflammatory	268	376	224
Cuff tear arthropathy	27	3,228	215
Acute fracture proximal humerus	16	740	484
Post old trauma	136	415	211
Avascular necrosis	102	132	138
Post recurrent dislocation	79	77	71

Approach	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Deltopectoral	3,966	6,298	1,933

Humeral stem type	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Standard	75	751	21
Stemless	125	18	6
Short/metaphyseal stem	54	111	27

Glennoid Morphology	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
A1	74	403	25
A2	62	201	8
B1	40	50	3
B2	56	116	6
B3	11	49	2
C	2	19	2
D	7	16	1

Attire & Environment

Operating theatre	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Conventional	2,746	4,170	1,510
Laminar flow	1,556	3,015	632

Surgeon Attire	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Space suits/Helmet Fan	783	1,291	413
One-piece Toga	23	63	8
Sterile Hood and Gown	24	84	10
Conventional Gown	208	742	47

ASA Class

This was introduced with the updated forms at the beginning of 2005.

For the sixteen- year period 2005 – 2021 there were 3,862 total shoulder procedures with the ASA class recorded.

Definitions

- ASA class 1:** A healthy patient
ASA class 2: A patient with mild systemic disease
ASA class 3: A patient with severe systemic disease that limits activity but is not incapacitating
ASA class 4: A patient with an incapacitating disease that is a constant threat to life

ASA Class	Total Shoulder Number (%)	Reverse Shoulder Number (%)	Hemi-arthroplasty Number (%)
1	430	383	199
2	2,365	3912	782
3	1,046	2697	518
4	21	100	15

Hospitals & Environment

Operative time (skin to skin)

Mean Operative Time (skin to skin)	Mean (SD)
Total shoulder	125.0 (33.4)
Reverse shoulder	109.5 (39.3)
Hemiarthroplasty	107.7 (40.7)

Surgeons Grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised.

The following figures are for the sixteen-year period 2005 – 2021 and are for total shoulder procedures.

Surgeon grade	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Consultant	4,193	6,905	3,358
Advanced trainee supervised	171	398	120
Advanced trainee unsupervised	6	14	25

Surgeon and Hospital Workload	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Hospitals	40	46	26
Operations	254	883	57
Public/Private	20/20	24/22	13/13
Consultants	53	75	28
Surgeons performing >=10 procedures	5	31	NIL

Top 10 total shoulder prostheses 2021

Prosthesis	N
Affinis Short stem	52
SMR stemless	34
SMR	32
Simpliciti TM	30
Global Unite	26
Aequalis Ascend Flex	20
Equinox Humeral	12
Mirai Humeral Core	10
Global AP	9
Univers Apex	8

Top 10 reverse shoulder prostheses 2021

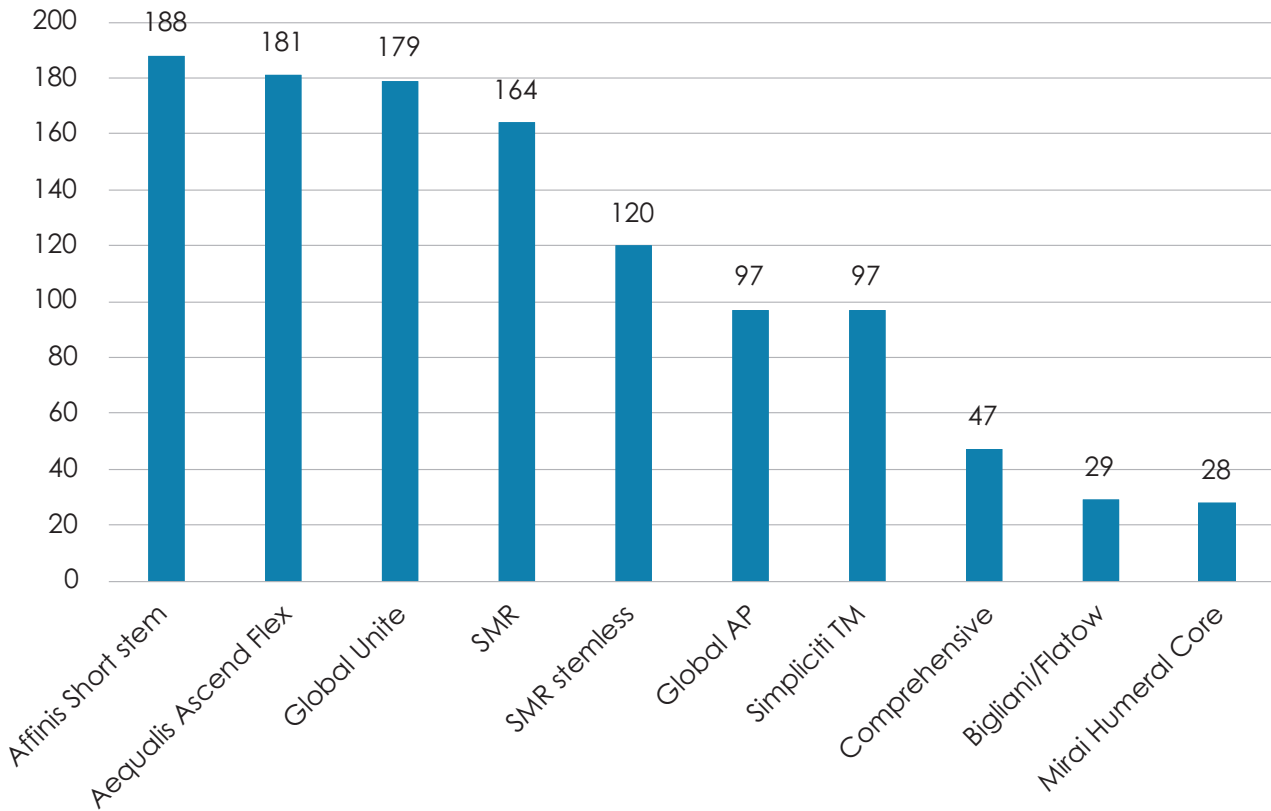
Prosthesis	N
SMR	432
Delta Xtend Reverse	123
Aequalis Ascend Flex	81
Comprehensive	45
Univers Revers	34
Equinox Humeral	33
Global Unite	30
Arthrex Univers Revers	24
Aequalis Reverse II	19
Aequalis Reversed Fracture	18

Top 10 Hemiarthroplasty shoulder prostheses 2021

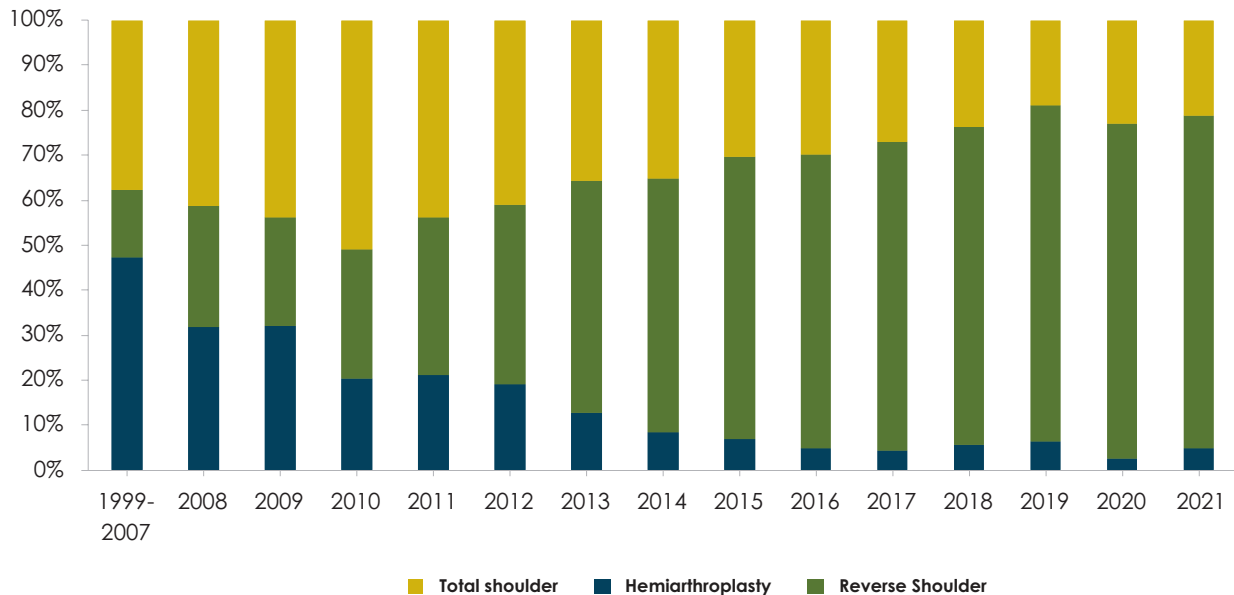
Prosthesis	N
Aequalis Ascend Flex	27
SMR	8
Affinis Short stem	4
Hemicap Resurfacing	4
Delta Xtend Reverse	3
Comprehensive	2
Global Unite	2
Aequalis Fracture	2
Global AP	1
Univers Apex	1



Top 10 Total shoulder prostheses for five years 2017- 2021



Percentages of the different types of shoulder prostheses used by year



REVISION SHOULDER ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced shoulder joint during which one or more of the components are exchanged, removed, manipulated or added.

Procedures where all components are removed (e.g., Girdlestone, ankle fusion post failed ankle replacement, or removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

REVISION OF REGISTERED PRIMARY SHOULDER ARTHROPLASTIES

Data Analysis

For the twenty-two-year period January 2000 – December 2021 there were 744 revisions of shoulder procedures registered.

There were 294 revisions of the total shoulder group of 4,363, 223 revisions of the reverse shoulder group of 7,277 and 227 revisions of the hemiarthroplasty group of 2,171.

The average age for a shoulder revision was 65 years with a range of 25 –89 years.

	Female	Male
Number	420	324
Percentage	56	44
Mean	65.23	62.21
Maximum age	88.66	77.55
Minimum age	25.66	33.45
Standard dev.	10.59	10.61

This section analyses data for revisions of total shoulder procedures for the twenty-two-year period January 2000 – December 2021.

For the total shoulder group there were 39 procedures that had been revised twice and 9 procedures that had been revised three times.

Time to revision- all shoulders	Days
Average	1,380
Maximum	6,862
Minimum	1
Standard deviation	1,405

Reason for Revision	Total Shoulder	Reverse Shoulder	Hemiarthroplasty
Deep infection	14	51	13
Loosening glenoid	71	45	0
Loosening humeral	6	15	11
Dislocation/instability anterior	37	52	14
Instability posterior	9	6	4
Rotator cuff impingement	8	0	5
Fracture humerus	3	12	5
Implant breakage/dissociation	6	2	0
Glenoid erosion	4	0	8
Pain	30	20	82
Loosening both	12	4	0
Total revisions	294	223	227



Analysis of the main reasons for revision by year after primary procedure for all shoulder types

Reason for revision	Loosening glenoid		Dislocation		Deep infection		Pain		Subacromial Cuff		Loosening Humeral	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
0	25	21.6	61	59.2	24	30.8	26	19.7	22	21.4	7	21.9
1	17	14.7	15	14.6	17	21.8	29	22.0	25	24.3	3	9.4
2	11	9.5	4	3.9	12	15.4	21	15.9	15	14.6	4	12.5
3	8	6.9	3	2.9	6	7.7	9	6.8	4	3.9	3	9.4
4	8	6.9	4	3.9	6	7.7	12	9.1	7	6.8	3	9.4
5	5	4.3	6	5.8	2	2.6	6	4.5	8	7.8	4	12.5
6	5	4.3	2	1.9	2	2.6	4	3.0	4	3.9	0	0.0
7	2	1.7	3	2.9	2	2.6	7	5.3	5	4.9	0	0.0
8	2	1.7	3	2.9	3	3.8	3	2.3	2	1.9	2	6.3
9	11	9.5	0	0.0	1	1.3	6	4.5	4	3.9	3	9.4
10	5	4.3	1	1.0	0	0.0	2	1.5	3	2.9	1	3.1
11+	17	14.7	1	1.0	3	3.8	7	5.3	4	3.9	2	6.3
Total	116		103		78		132		103		32	

All Total Shoulder Arthroplasties

Total	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
All patients	13,816	81600.7	744	0.9118	0.85	0.98

Revision rate by sex

Sex	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
F	8,440	51319.0	420	0.82	0.74	0.90
M	5,376	30281.7	324	1.07	0.96	1.19

Revision vs Age Bands

Age Bands	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Exact 95% confidence interval	
<55	831	5582.3	103	1.85	1.50	2.23
55-64	2,491	15945.0	239	1.50	1.31	1.70
65-74	5,374	32498.0	263	0.81	0.71	0.91
>=75	5,120	27575.4	139	0.50	0.42	0.59

Revision by Ethnicity

Ethnicity	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Asian	432	2021.4	13	0.64	0.34	1.10
Euro/Other	12,646	75040.8	694	0.92	0.86	1.00
Māori	421	2325.4	26	1.12	0.73	1.64
Not Recorded	182	1344.2	7	0.52	0.19	1.02
Pacifica	135	869.0	4	0.46	0.13	1.18

Revision rate of Shoulder Prostheses by Arthroplasty Type

Operation Typ	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	2,171	18822.0	227	1.21	1.05	1.37
Reverse shoulder	7,277	31757.8	223	0.70	0.61	0.80
Total shoulder	4,363	31017.6	294	0.95	0.84	1.06

Revision vs Glenoid Fixation (Conventional Total arthroplasties only)

Age Bands	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Exact 95% confidence interval	
UnCemented	1,220	8824.6	167	1.89	1.62	2.20
Cemented	3,143	22193.0	127	0.57	0.48	0.68

Revision vs Prosthesis Group vs Age Bands

Shoulder Type	Age Bands	No. Ops	Observed comp. Yrs	Events	Rate/100-component-years		Upper 95% CI
Hemiarthroplasty	<55	393	3306.1	60	1.81	1.37	2.32
	55-64	481	4484.5	80	1.78	1.40	2.21
	65-74	616	5802.3	58	1.00	0.76	1.29
	>=75	681	5229.0	29	0.55	0.36	0.79
Reverse shoulder	<55	101	349.1	5	1.43	0.47	3.34
	55-64	880	3627.0	51	1.41	1.05	1.85
	65-74	2,871	12699.8	93	0.73	0.59	0.90
	>=75	3,425	15081.9	74	0.49	0.39	0.62
Total shoulder	<55	337	1927.2	38	1.97	1.37	2.68
	55-64	1,128	7832.9	108	1.38	1.13	1.66
	65-74	1,885	13993.8	112	0.80	0.66	0.96
	>=75	1,013	7263.7	36	0.50	0.35	0.69



Revision vs Surgeon Annual Workload

Consultant Number of ops/yr	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Exact 95% confidence interval	
<10	3,929	24,041.3	234	0.97	0.85	1.11
>=10	8,686	47,946.8	439	0.92	0.83	1.01

Revision vs Surgeon Annual Workload

CONSULTANT NUMBER OF OPERATIONS / YEAR	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<10	4,152	26291.3	251	0.95	0.84	1.08
>=10	9,664	55309.4	493	0.89	0.81	0.97

Revision Rate of Individual Shoulder Prostheses Sorted on Alphabetical Order

Operation Type	Prosthesis	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	Aequalis	142	1426.6	16	1.12	0.64	1.82
	Aequalis Ascend	1	1.0	0	0.00	0.00	382.77
	Aequalis Ascend Flex	184	622.7	5	0.80	0.26	1.87
	Aequalis Fracture	2	1.2	0	0.00	0.00	310.45
	Aequalis Reverse II	1	2.4	0	0.00	0.00	153.46
	Affinis	1	2.7	0	0.00	0.00	136.23
	Affinis Short stem	17	61.9	1	1.61	0.04	8.99
	Anatomical	19	273.0	0	0.00	0.00	1.35
	Arthrex Eclipse	3	29.3	0	0.00	0.00	12.59
	Arthrex Univers	1	1.5	0	0.00	0.00	248.59
	Arthrex Univers Revers	1	1.2	0	0.00	0.00	298.75
	Ascend TM	1	6.9	0	0.00	0.00	53.62
	Bi-Angular	19	235.2	2	0.85	0.10	3.07
	Bigliani/Flatow	137	1508.1	15	0.99	0.53	1.60
	Bio-modular	1	7.1	1	14.00	0.35	78.03
	Cofield 2	50	629.8	1	0.16	0.00	0.88
	Comprehensive	5	11.9	0	0.00	0.00	30.92
	Delta	1	8.8	0	0.00	0.00	42.08
	Delta Xtend Reverse	34	160.8	4	2.49	0.68	6.37
	Epoca Humeral stem	1	6.8	0	0.00	0.00	54.39
	Equinox Humeral	1	1.0	0	0.00	0.00	384.96
	Global	723	7407.0	62	0.84	0.64	1.07
	Global AP	97	658.4	7	1.06	0.38	2.09
Global Icon	1	3.8	0	0.00	0.00	96.52	
Global Unite	67	288.6	14	4.85	2.65	8.14	

Operation Type	Prosthesis	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Lower 95% CI	Upper 95% CI
Hemi, continued	Hemicap Resurfacing	4	2.1	0	0.00	0.00	171.86
	Latitude	1	1.1	0	0.00	0.00	338.53
	MRS Humeral	4	21.9	0	0.00	0.00	16.81
	Neer II	24	251.2	0	0.00	0.00	1.47
	Osteonics humeral component	42	406.6	2	0.49	0.06	1.78
	Randelli	1	8.2	0	0.00	0.00	44.82
	Simpliciti TM	3	10.5	0	0.00	0.00	35.27
	SMR	354	2642.0	51	1.93	1.44	2.54
	SMR Resurfacing	52	444.2	14	3.15	1.72	5.29
	SMR stemless	1	3.9	0	0.00	0.00	95.15
	Univers 3D	1	3.8	0	0.00	0.00	96.59
	Univers Apex	1	0.4	0	0.00	0.00	904.27
	Reverse shoulder	Aequalis Ascend	1	1.1	0	0.00	0.00
Aequalis Ascend Flex		585	2023.8	23	1.14	0.70	1.68
Aequalis Flex Revive		6	3.9	0	0.00	0.00	94.02
Aequalis Reverse II		225	1001.9	6	0.60	0.22	1.30
Aequalis Reversed		2	9.0	0	0.00	0.00	41.02
Aequalis Reversed Fracture		82	276.0	1	0.36	0.01	2.02
Affinis		1	0.7	0	0.00	0.00	547.71
Affinis Fracture stem		4	11.0	1	9.13	0.23	50.85
Affinis Inverse		2	1.9	0	0.00	0.00	191.66
Affinis Inverse stem		39	113.5	3	2.64	0.55	7.72
Arthrex Univers		13	17.3	0	0.00	0.00	21.34
Arthrex Univers Revers		107	179.0	1	0.56	0.00	3.11
Comprehensive		283	881.3	5	0.57	0.18	1.32
Custom device		1	0.5	0	0.00	0.00	680.49
Delta		55	531.3	2	0.38	0.05	1.36
Delta Xtend Reverse		2,091	10421.3	84	0.81	0.64	1.00
Equinox Humeral		103	164.0	3	1.83	0.38	5.35
Flex Shoulder System		1	1.3	0	0.00	0.00	281.88
Global Unite		61	89.6	0	0.00	0.00	4.12
Humeral stem		1	1.5	0	0.00	0.00	249.97
Mirai Humeral Core		9	4.8	0	0.00	0.00	76.69
Mirai Humeral Stem		4	4.5	0	0.00	0.00	81.81
Mutars		1	3.6	0	0.00	0.00	103.72
RSP		2	6.8	0	0.00	0.00	53.89
SMR		3,420	15502.2	89	0.57	0.46	0.70



Operation Type	Prosthesis	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Lower 95% CI	Upper 95% CI
Reverse shoulder, continued	SMR stemless	58	189.3	3	1.59	0.22	4.23
	Trabecular Metal Reverse	56	256.5	2	0.78	0.09	2.82
	Univers Revers	55	40.7	0	0.00	0.00	9.07
	Vaios	1	10.7	0	0.00	0.00	34.48
	Zimmer Trabecular Metal Should	3	4.3	0	0.00	0.00	86.76
Total shoulder	Aequalis	290	2958.5	17	0.57	0.33	0.92
	Aequalis Ascend Flex	360	1656.9	9	0.54	0.23	0.99
	Affinis	8	25.4	0	0.00	0.00	14.52
	Affinis Fracture stem	1	2.6	0	0.00	0.00	144.26
	Affinis Short stem	213	503.6	3	0.60	0.12	1.74
	Anatomical	35	493.2	2	0.41	0.05	1.46
	Arthrex Eclipse	18	45.2	0	0.00	0.00	8.16
	Arthrex Univers	6	9.4	0	0.00	0.00	39.16
	Arthrex Univers Revers	1	1.2	0	0.00	0.00	314.07
	Ascend TM	2	12.9	0	0.00	0.00	28.67
	Bi-Angular	8	53.9	0	0.00	0.00	6.85
	Bigliani/Flatow	310	3303.4	12	0.36	0.19	0.63
	Cofield 2	21	259.3	0	0.00	0.00	1.42
	Comprehensive	69	243.8	4	1.64	0.45	4.20
	Custom device	1	1.9	0	0.00	0.00	197.85
	Delta Xtend Reverse	7	5.1	0	0.00	0.00	72.75
	Epoca Humeral stem	4	41.1	0	0.00	0.00	8.99
	Equinox Humeral	24	32.4	1	3.08	0.08	17.18
	Global	519	5553.9	32	0.58	0.39	0.81
	Global AP	534	3912.6	14	0.36	0.19	0.58
	Global Icon	13	28.0	2	7.13	0.38	25.77
	Global Unite	278	1057.7	9	0.85	0.39	1.62
	Humeral stem	1	8.2	0	0.00	0.00	44.72
	Mirai Humeral Core	28	29.3	0	0.00	0.00	12.59
	Mirai Humeral Stem	1	1.6	0	0.00	0.00	235.97
	MUTARS	1	1.2	0	0.00	0.00	304.83
	Neer 3	2	31.4	0	0.00	0.00	11.74
	Neer II	12	163.7	1	0.61	0.02	3.40
	Osteonics humeral component	49	559.7	8	1.43	0.62	2.82
	Sidus	1	7.3	0	0.00	0.00	50.35
	Simpliciti TM	114	307.5	2	0.65	0.08	2.35
	SMR	1,065	7846.2	162	2.06	1.75	2.40

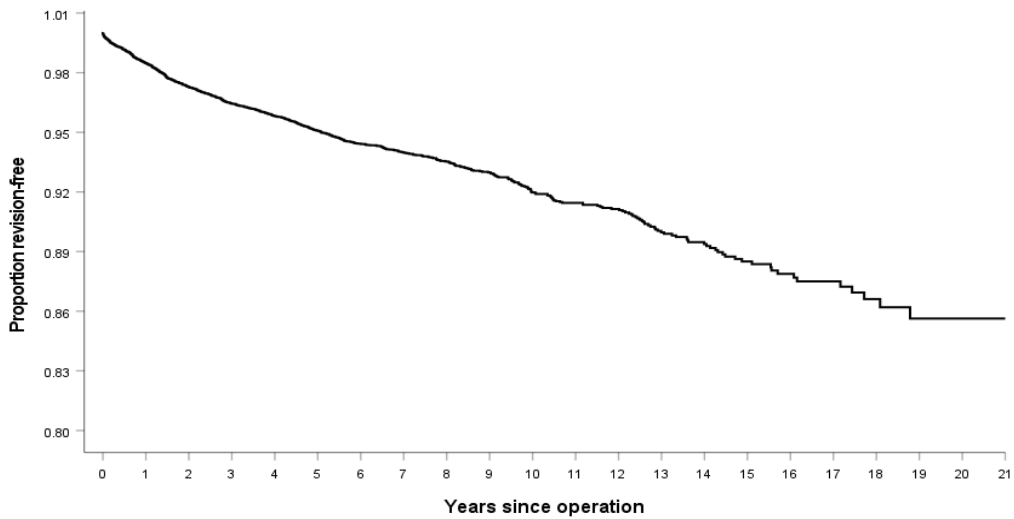
Operation Type	Prosthesis	No. Ops	Observed comp. Yrs	Number Revised	Rate/100 component-years	Lower 95% CI	Upper 95% CI
Total shoulder, continued	SMR Resurfacing	3	22.6	2	8.83	1.07	31.90
	SMR stemless	151	396.7	7	1.76	0.71	3.64
	Trabecular Metal Reverse	1	10.5	0	0.00	0.00	35.23
	Univers 3D	5	28.2	0	0.00	0.00	13.09
	Univers Apex	24	34.1	0	0.00	0.00	10.81
	Univers II	1	1.6	1	62.87	1.59	350.27
	Univers Revers	1	0.1	0	0.00	0.00	2542.19



KAPLAN MEIER CURVES

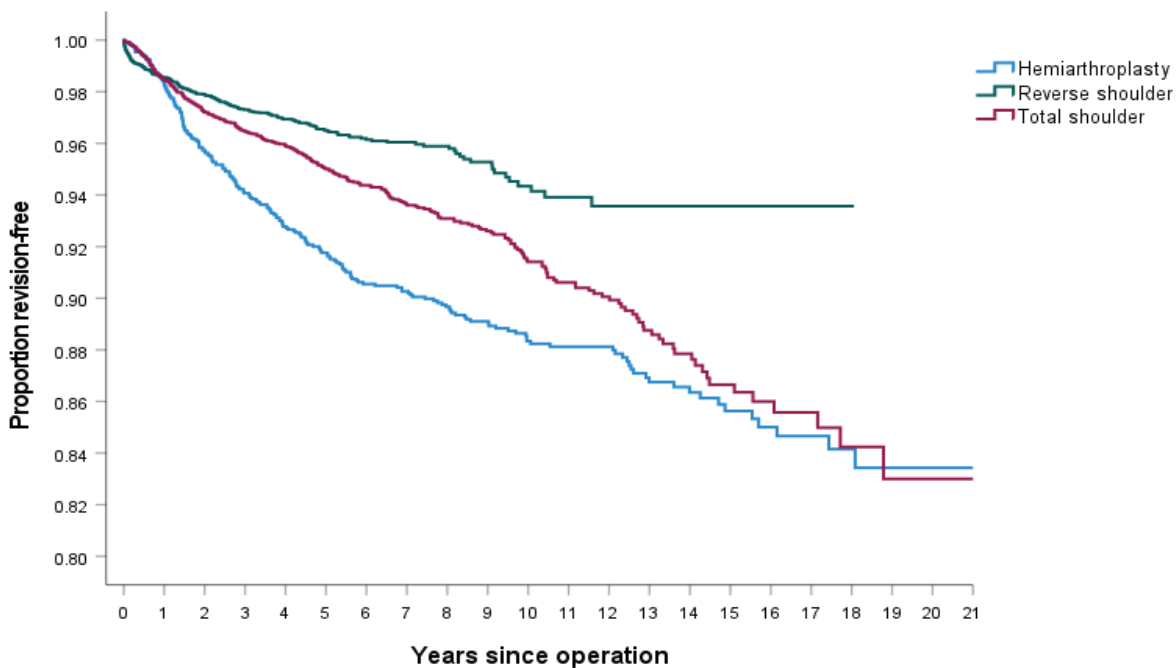
The following Kaplan Meier survival analyses are for the 22 years from 2000 to 2021, with deceased patients censored at time of death.

All Shoulders



Years	% Revision-free	N
1	98.5	12,253
2	97.3	10,763
3	96.4	9,374
4	95.8	8,049
5	95.1	6,833
6	94.4	5,761
7	94.0	4,720
8	93.5	3,874
9	93.0	3,138
10	92.0	2,480
11	91.5	1,991
12	91.1	1,596
13	90.0	1,225
14	89.4	924
15	88.5	668
16	87.9	477
17	87.5	350
18	86.6	220
19	85.6	128
20	85.6	68

Survival curves for different shoulder categories



PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTH, FIVE YEARS, TEN YEARS AND FIFTEEN YEARS POST-SURGERY

Questionnaires at six months post-surgery

At six months post-surgery patients are sent the Oxford-12 questionnaire.

The scores now range from 4 to 48. A score of 48 is the best, indicating normal function. A score of 0 is the worst, indicating the most severe disability.

We have grouped the questionnaire responses based on the scoring system as published by Kalairajah et al, in 2005 (See appendix 1). This groups each score into four categories:

Category	Score	Interpretation
Category 1	>41	Excellent
Category 2	34 – 41	Good
Category 3	27 – 33	Fair
Category 4	< 27	Poor

For the twenty-two-year period and as at July 2022, there were 8,251 shoulder questionnaire responses registered at six months post-surgery.

The average shoulder score was 36.49 (standard deviation 9.39, range 0 – 48)

Oxford Scores at 6 months	N
> 41	3,074
34 -41	2,657
27 -33	1,228
< 27	1,293

At six months post-surgery, 69% had an excellent or good score.

Operation type	N	Mean Score	Std. Error	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	1,245	32.3	0.3	31.8	32.9
Reverse Shoulder	4,043	35.6	0.1	35.4	35.9
Total Shoulder	2,766	39.6	0.2	39.3	39.9
Total	8,054	36.5	0.1	36.3	36.7

Questionnaires at five years post-surgery

All patients who had a six-month registered questionnaire, and who had not had revision surgery, were sent a further questionnaire at five years post-surgery.

This dataset represents sequential Oxford shoulder scores for 2,795 individual patients.

At five years post-surgery, 81% of these patients achieved an excellent or good score and had an average of 40.17.

Five Year Oxford Scores

Operation type	N	Mean Score	Std. Error	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	541	35.9	0.4	35.1	36.8
Reverse Shoulder	1,004	39.8	0.3	39.3	40.4
Total Shoulder	1,186	42.3	0.2	41.9	42.7
Total	2,731	40.1	0.2	39.8	40.5



Questionnaires at ten years post-surgery

All patients who had a six- month registered questionnaire, and who had not had revision surgery, were sent a further questionnaire at ten years post-surgery.

This dataset represents sequential Oxford shoulder scores for 764 individual patients.

At ten years post-surgery, 79% of these patients achieved an excellent or good score and had an average of 39.74.

Ten Year Oxford Scores

Operation type	N	Mean Score	Std. Error	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	280	36.9	0.6	35.8	38.1
Reverse Shoulder	182	39.2	0.7	37.9	40.5
Total Shoulder	503	41.5	0.4	40.8	42.2
Total	965	39.7	0.3	39.2	40.3

Questionnaires at fifteen years post-surgery

All patients who had a six- month registered questionnaire, and who had not had revision surgery, were sent a further questionnaire at fifteen years post-surgery.

This dataset represents sequential Oxford shoulder scores for 269 individual patients.

At fifteen years post-surgery, 74% of these patients achieved an excellent or good score and had an average of 38.30.

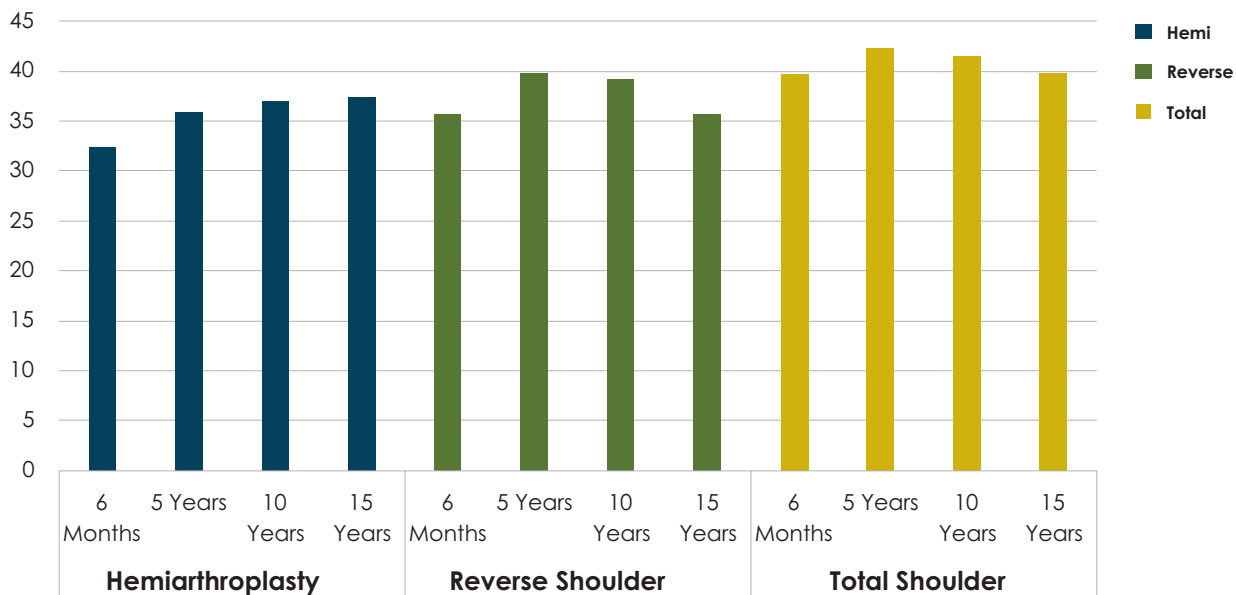
Fifteen Year Oxford Scores

Operation type	N	Mean Score	Std. Error	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	113	37.29	0.9	35.6	39.0
Reverse Shoulder	27	35.62	2.42	30.9	40.4
Total Shoulder	129	39.75	0.71	38.4	41.4
Total	269	38.3	0.56	37.2	39.4

Six Month, Five-,Ten- and Fifteen Year Oxford Scores by Arthroplasty Type

		Mean	Std. Error	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	6 Months	32.33	0.28	31.78	32.89
	5 Years	35.94	0.42	35.11	36.77
	10 Years	36.94	0.56	35.83	38.05
	15 Years	37.29	0.9	35.6	39.0
Reverse Shoulder	6 Months	35.65	0.15	35.36	35.94
	5 Years	39.83	0.27	39.31	40.36
	10 Years	39.16	0.66	37.86	40.46
	15 Years	35.62	2.42	30.9	40.4
Total Shoulder	6 Months	39.62	0.15	39.32	39.92
	5 Years	42.31	0.21	41.90	42.73
	10 Years	41.51	0.36	40.81	42.22
	15 Years	39.75	0.71	38.4	41.4

Comparison of six month and five-, ten- and fifteen-year oxford scores by arthroplasty type



OXFORD 12 SCORE AS A PREDICTOR OF SHOULDER ARTHROPLASTY REVISION

A statistically significant relationship has been confirmed between the Oxford scores at six months and five years and arthroplasty revision within two years of the Oxford 12 questionnaire date.

Six-month score and revision arthroplasty

Plotting the patients' six-month scores in the Kalairajah groupings against the proportion of shoulders revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 6 times the risk of a revision within two years compared to a person with a score of >41.

Revision risk versus Kalairajah groupings of Oxford scores within two years of the six- month score date

Kalairajah group	Revision to 2 years	Number revised	%	Standard error
0-26	1,021	66	6.46	0.77
27-33	986	32	3.25	0.56
34-41	2,178	22	1.01	0.21
> 41	2,509	25	1.00	0.20

Revision (%) to 2 years by Oxford score at 6 months

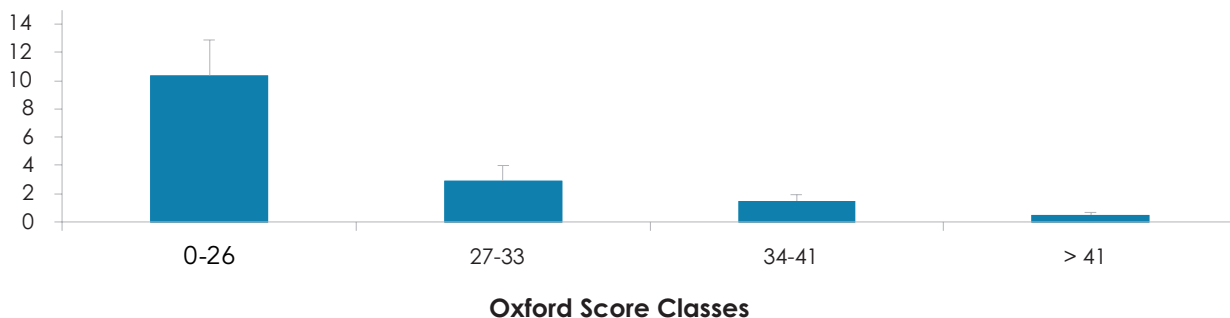




Five-year score and revision arthroplasty

Plotting the patients' five-year scores in the Kalairajah groupings against the proportion of shoulders revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score, although it is not as clear cut as for the hips and knees. A patient with a score below 27 has 8 times the risk of a revision within two years compared to a person with a score of >41.

Revision (%) to 2 years by Oxford score at 5 Years



Revision risk versus Kalairajah groupings of Oxford scores within two years of the 5 -year score date

Kalairajah group	Revision to 2 years	Number revised	%	Standard error
0-26	174	5	2.87	1.27
27-33	227	6	2.64	1.06
34-41	491	4	0.81	0.41
> 41	1,191	4	0.34	0.17

Revision shoulder questionnaire responses

There were 563 revision shoulder responses with 46% achieving an excellent or good score. This group includes all revision shoulder responses. The average revision shoulder score was 30.86 (standard deviation 10.63; range 3 – 48).

ELBOW ARTHROPLASTY

PRIMARY ELBOW ARTHROPLASTY

The **twenty-three-year** report analyses data for the period January 2000 – December 2021. There were 721 primary elbow procedures registered.

Data Analysis

Age and sex distribution

The average age for an elbow replacement was 67 years, with a range of 15 – 92 years.

	Female	Male
Number	546	175
Percentage	75.75	24.25
Mean age	68.08	65.07
Maximum age	92.41	91.73
Minimum age	36.38	15.16
Standard dev.	11.49	14.14

Previous operation	N
None	593
Internal fixation for juxta articular fracture	42
Synovectomy+-removal radial head	25
Debridement	22
Osteotomy	3
Ligament reconstruction	4
Interposition arthroplasty	3

Diagnosis	N
Rheumatoid arthritis/other inflammatory	325
Post fracture	272
Osteoarthritis	103
Post dislocation	14
Post ligament disruption	6
Tumour	1

Approach	N
Posterior	450
Medial	112
Lateral	66

Systemic antibiotic prophylaxis	N
Patient number receiving at least one systemic antibiotic	675

Operating theatre	N
Conventional	475
Laminar flow	246

Surgeon attire	N
Space Suits/Helmet Fan	88
Conventional gown	56

ASA Class

This was introduced with the updated forms at the beginning of 2005.

For the sixteen- year period 2005 – 2021, there were 565 primary elbow procedures with the ASA class recorded.

ASA Class	ASA Definition	N
1	A healthy patient	31
2	Mild systemic disease	263
3	Moderate systemic disease	261
4	Incapacitating systemic disease	10

Operative time (skin to skin)	Duration
Mean	147 minutes
Range	29-417 minutes
Standard deviation	46.7

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the sixteen- year period 2005 – 2021.

Surgeon grade	N
Consultant	682
Advanced trainee supervised	15
Advanced trainee unsupervised	12

Surgeon and hospital workload

In 2021, 32 surgeons performed 57 primary elbow procedures. These ranged from 1 (n=23), 2-5 (n=8) and >5 (n=1) procedures performed per surgeon.

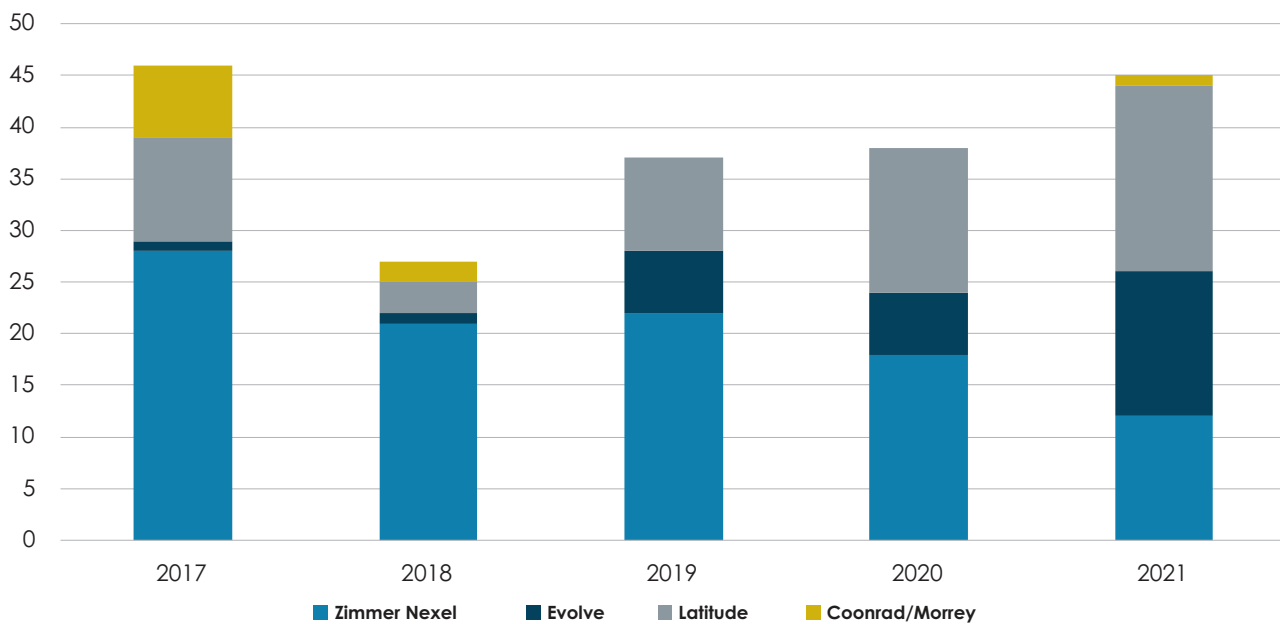
Hospitals

In 2021, primary elbow replacement was performed in 21 hospitals, of which 14 were public and 7 were private.



Prosthesis usage

MOST USED ELBOW PROSTHESES FOR FIVE YEARS 2017 – 2021



REVISION ELBOW ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced elbow joint during which one or more of the components are exchanged, removed, manipulated or added.

Procedures where all components are removed (e.g., Girdlestone, ankle fusion post failed ankle replacement, or removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

Data Analysis

For the twenty-one-year period January 2000 – December 2020, there were 127 revision elbow procedures registered.

The average age for a revision elbow replacement was 65 years, with a range of 30 – 91 years.

	Female	Male
Number	92	35
Percentage	72.44	27.56
Mean	65.71	64.74
Maximum age	89.08	90.50
Minimum age	31.53	30.34
Standard dev.	10.28	14.60

REVISION OF REGISTERED PRIMARY ELBOW ARTHROPLASTIES

This section analyses data for revisions of primary elbow procedures for the twenty-two-year period January 2000 – December 2021.

There were 54 revisions of the primary group of 721.

There were 8 that had been revised twice.

All Primary Total Elbow Replacements

	N	Sum comp years	Events	Rate/100-component-years	Exact 95% CI	
All patients	721	4982.0	54	1.08	0.81	1.41

Revision vs Gender

Sex	N	Sum comp years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Females	546	3975.2	36	0.91	0.63	1.25
Males	175	1006.7	18	1.79	1.02	2.76

Revision vs Age Group

Age Group	N	Sum comp years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<55	119	1036.3	17	1.64	0.92	2.57
55-64	169	1416.2	15	1.06	0.59	1.75
65-74	224	1417.4	15	1.06	0.59	1.75
>=75	209	1112.1	7	0.63	0.25	1.30

Revision vs Ethnicity

Ethnicity	N	Sum comp years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Asian	22	205.3	1	0.49	0.01	2.71
Euro/Other	635	4306.0	45	1.05	0.75	1.39
Māori	41	265.8	6	2.26	0.83	4.91
Not Recorded	8	54.2	1	1.84	0.05	10.28
Pacifica	15	150.7	1	0.66	0.02	3.70



Revision rate of Individual Prostheses sorted in Alphabetical Order

Prosthesis	N	Sum comp years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Acclaim	16	172.4	7	4.06	1.63	8.37
Align Radial Stem	1	0.1	0	0.00	0.00	3849.61
Anatomic radial head	1	1.0	0	0.00	0.00	384.96
Coonrad/Morrey	348	3133.6	19	0.61	0.37	0.95
Custom Cem Stem	1	0.1	0	0.00	0.00	5614.01
Evolve Stem	46	188.2	2	1.06	0.13	3.84
Humeral stem	1	0.4	0	0.00	0.00	942.21
Kudo	18	184.7	4	2.17	0.59	5.54
Latitude	137	813.2	14	1.72	0.94	2.89
Mutars	1	5.9	0	0.00	0.00	63.02
Sorbie Questor	1	6.8	0	0.00	0.00	54.09
Stanmore custom implant	1	11.4	0	0.00	0.00	32.26
Zimmer Nexel	139	455.54	8	1.76	0.76	3.46

Time to revision	Days
Average	1,745 (4.78 years)
Maximum	5,499
Minimum	62
Standard deviation	1,462

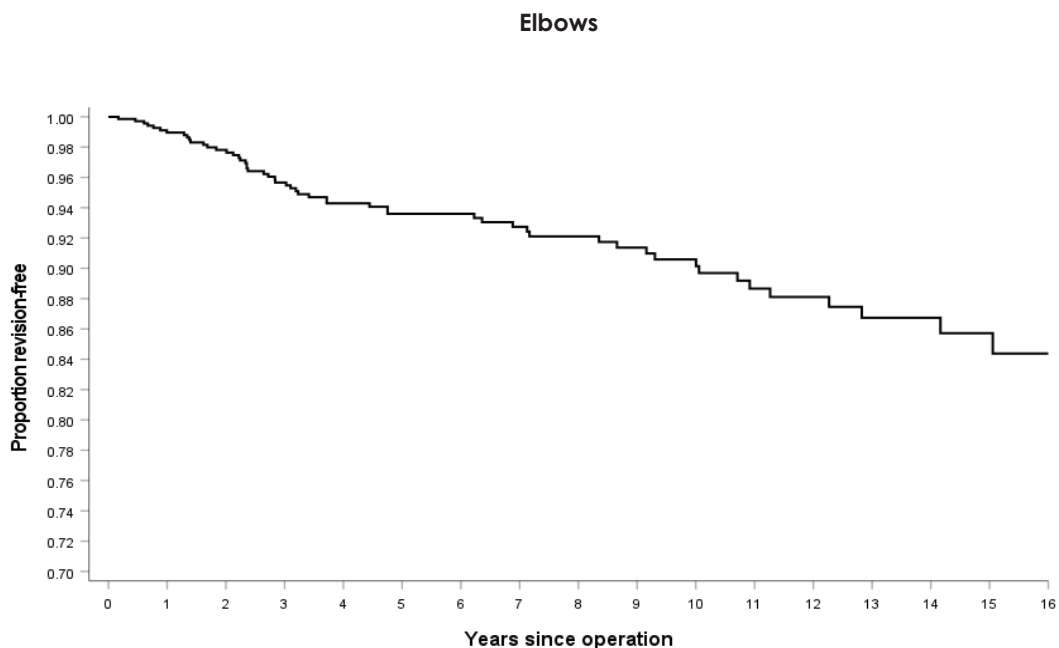
Reason for revision	N
Loosening ulnar	18
Loosening humeral	18
Deep infection	15
Pain	6
Loosening radial head	5
Fracture humerus	4
Dislocation	2
Fracture ulna	2
Loose pin and bushing	1

Analysis of the three main reasons for revision by year after primary procedure

Years since operation	Loosening humeral		Loosening Ulnar		Deep infection	
	Count	%	Count	%	Count	%
0	1	6.3	1	5.6	3	20.0
1	2	12.5	0	0.0	4	26.7
2	5	31.3	6	33.3	3	20.0
3	3	18.8	3	16.7	1	6.7
4	2	12.5	0	0.0	0	0.0
5	1	6.3	0	0.0	0	0.0
6	1	6.3	1	5.6	1	6.7
7	1	6.3	1	5.6	0	0.0
8	1	6.3	1	5.6	1	6.7
9	1	6.3	2	11.1	0	0.0
10	1	6.3	2	11.1	0	0.0
11+	19	118.8	1	5.6	2	13.3
Total	38		18		15	

KAPLAN MEIER CURVES

The following Kaplan Meier survival analyses are for the 22 years from 2000 to 2021 with deceased patients censored at time of death.



Years since operation	% Revision-free	Number
1	99.0	634
2	97.8	575
3	95.7	502
4	94.3	448
5	93.6	390
6	93.6	347
7	92.7	301
8	92.1	261
9	91.4	241
10	90.6	202
11	88.7	168
12	88.1	143
13	86.7	117
14	86.7	90
15	85.7	65
16	84.4	51

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX MONTHS POST-SURGERY

Questionnaires at six months post-surgery

At six months post-surgery patients are sent an outcome questionnaire.

This was replaced by the validated Oxford Elbow score at the end of 2015.

There are 12 questions and each response scores from 4-0 with 0 representing the greatest severity.

Total score range 0-48

For the 6-year period 2016 – 2021 there were n = 111 responses. The average score was 32.5, the range was 0-48 and the standard deviation was 11.6.

LUMBAR DISC REPLACEMENT

PRIMARY LUMBAR DISC REPLACEMENT

This report analyses data for the **twenty-year period** January 2002 – December 2021.

There were 195 lumbar disc replacements registered.

Data Analysis

The average age for a lumbar disc replacement was 40 years, with a range of 22 – 62 years.

	Female	Male
Number	86	109
Percentage	44.10	55.90
Mean age	40.50	39.49
Maximum age	62.19	60.71
Minimum age	24.07	22.25
Standard dev.	8.71	7.88

Disc replacement levels	N
L3/4	22
L4/5	122
L5/S1	49

Fusion levels	N
L3/4	16
L4/5	121
L5/S1	241

Previous operation	N
Discectomy	30
L3/4	0
L4/5	11
L5/S1	18

Diagnosis: Degenerative disc disease	N
L3/4	13
L4/5	66
L5/S1	101

Annular tear MRI scan	N
L3/4	14
L4/5	73
L5/S1	39

Discogenic pain on discography	N
L3/4	20
L4/5	88
L5/S1	64

Approach	N
Retroperitoneal midline	154
Retroperitoneal lateral	4
Transperitoneal	18

Intraoperative complications	N
Damage to major veins	13
Subsidence	1

Systemic antibiotic prophylaxis	N
Patient number receiving systemic antibiotic prophylaxis	166

Operating theatre	N
Conventional	118
Laminar flow	75

Surgeon Attire	N
Space suits/Helmet Fan	2

Operative time (skin to skin)	Minutes
Mean	130

Surgeon grade	N
Consultant	195

REVISION OF REGISTERED PRIMARY LUMBAR DISC REPLACEMENTS

There has been no change in the number of revisions.

There were 3 revisions of the primary group of 195 lumbar disc replacements.

Time to revision	Days
Mean	1,841
Maximum	4,528
Minimum	242

Reason for revision	N
Pain	2
Loss of spinal alignment	1

CERVICAL DISC REPLACEMENT

This report analyses data for the **eighteen-year** period January 2004 – December 2021.

There were 635 primary cervical disc replacements.

Data Analysis

The average age for a cervical disc replacement was 46 years, with a range of 22 – 73 years.

	Female	Male
Number	279	356
Percentage	43.94	56.06
Mean age	47.01	44.96
Maximum age	73.32	73.02
Minimum age	23.26	22.07
Standard dev.	8.41	9.39

Disc replacement levels	N
C3/4	17
C4/5	66
C5/6	358
C6/7	297
C7T1	13

Previous operation	N
Foraminotomy	20
Adjacent level fusion	30
Adjacent level disc arthroplasty	5

Diagnosis	N
Acute disc prolapse	430
Chronic spondylosis	79
Neck pain	34

Approach	N
Anterior right	366
Anterior left	126

Intra operative complications	N
Equipment failure	1
Removal of implant	1
Tear jugular vein	1
Misplaced prosthesis removed and new device placed	1

Systemic antibiotic prophylaxis	N
Patient number receiving systemic antibiotic prophylaxis	539

Operating theatre	N
Conventional	317
Laminar flow	305

Surgeon Attire	N
Space suits/Helmet fan	1
Sterile hood and gown	1
Conventional gown	16

Operative time (skin to skin)	Minutes
Average	105

Surgeon grade	N
Consultant	630
Advanced trainee supervised	2

Revision Cervical disc replacement

There were 3 revisions registered.

Neck Disability Index Scoring

There are 10 sections. For each section, the total score is 5: if the first statement is marked the score = 0; if the last statement is marked, the score = 5. Intervening statements are scored according to rank.

If more than one box is marked in each section, take the highest score.

If all 10 sections are completed, the score is calculated as follows:

Example:

$16 \text{ (total scored)} / 50 \text{ (total possible score)} \times 100 = 32\%$

If one section is missed (or not applicable) the score is calculated:

Example:

$16 \text{ (total scored)} / 45 \text{ (total possible score)} \times 100 = 35.5\%$

0 is the best score and 100 is the worst score.

Post-operative score

Neck Disability Index	2,139
Mean	19.07

APPENDIX 1 - OXFORD 12 QUESTIONNAIRE REFERENCES

Murray, D.W et al, *The use of the Oxford hip and knee scores*. J Bone Joint Surg (Br) 2007; 89-B: 1010-14

Questionnaire on the perceptions of patients about shoulder surgery Jill Dawson, Ray Fitzpatrick, Andrew Carr. J Bone Joint Surg B. 1996 July; 78(4) 593-600

Kalairajah, Y et al, *Health outcome measures in the evaluation of total hip arthroplasties: a comparison between the Harris hip score and the Oxford hip score*. J Arthroplasty 2005; 20: 1037-41



NEW ZEALAND JOINT REGISTRY

Established by the New Zealand Orthopaedic Association

**Department of Orthopaedic Surgery and Musculoskeletal Medicine
Christchurch Hospital
Private Bag 4710
Christchurch 8140**

E-mail: jinny.willis3@cdhb.health.nz

CONSENT FORM

TO BE FILED IN PATIENT NOTES

REQUEST FOR INTERPRETER			
English	I wish to have an interpreter	Yes	No
Maori	E hiahia ana ahau ki tetahi kaiwhakamaori/kaiwhaka pakeha korero	Ae	Kao
Samoan	Oute mana’o ia iai se fa’amatala upu	loe	Leai
Tongan	Oku ou fiema’u ha fakatonulea	lo	Ikai
Cook Island	Ka inangaro au I tetai tangata uri reo	Ae	Kare
Niuean	Fia manako au ke fakaaoga e taha tagata fakahokohoko kupu	E	Nakai

The New Zealand Orthopaedic Association has a New Zealand Joint Registry which records the technical data on all artificial joint replacement surgery performed in New Zealand, eg, the different types of artificial joints implanted, whether cemented or not, how long the operation took, the need to use antibiotics. The Register will provide independent data on the performance of these artificial joints over many years. The data will be used in the future for an audit of joint replacement outcomes and will identify the factors which will provide the best long term surgical results for New Zealanders.

You are asked for your consent to allow your name, address, date of birth, national health index number along with the technical data on your joint surgery to be forwarded to the Registry.

We need this information in order to track the outcome over many years of your artificial joint replacement.

No other personal information will be entered without your written consent and it will not be possible to identify your name from any information taken from the data base for audit purposes.

If you wish to withdraw from the Register, you may do so by writing to the New Zealand Joint Registry, Department of Orthopaedic Surgery and Musculoskeletal Medicine, Christchurch Hospital. Withdrawing from the Register will not affect your current or future health care in any way.

**Mr John McKie
Registry Supervisor**

I consent to my name, address, date of birth, national health index number along with the technical data on my joint surgery being forwarded to the New Zealand Joint Registry.

Signed: Name:
Date:



NEW ZEALAND JOINT REGISTRY

Established by the New Zealand Orthopaedic Association

PRIMARY JOINT REPLACEMENT QUESTIONNAIRE

Dear

The New Zealand Orthopaedic Association has a National Joint Replacement Register which records technical information about all artificial hip, knee, shoulder, elbow and ankle replacements carried out in New Zealand. This Register will provide very important data on the performance of these artificial joints over many years and enable identification of the factors which produce the best long-term results for New Zealanders like you.

In order to enhance the value of the research results, it will be extremely helpful to have your opinion as to the success of your artificial joint replacement. Therefore, you are invited to answer a few written questions at regular intervals on how you feel about your joint replacement. This questionnaire refers to the left knee surgery you had approximately six months ago.

Enclosed is more information regarding the New Zealand Joint Registry and I hope you will take the time to read it and complete the questionnaire.

Please note that your Regional Ethics Committee has approved the project.

Yours sincerely

Mr John McKie

Supervisor

New Zealand Joint Registry

Please fill out the details below and answer the questions overleaf and return in the enclosed envelope.

If you prefer, you may answer your questionnaire online at www.nzoa.org.nz/nzjr-patient-questionnaires.

PATIENT NAME _____

DATE OF BIRTH _____

EMAIL _____

MOBILE _____

Mailing address: Department of Orthopaedic Surgery and Musculoskeletal Medicine, Christchurch Hospital, Private Bag 4710, Christchurch 8140. Or scan/email to: jimmy.willis3@cdhb.health.nz

The theatre forms were significantly revised in November 2020. The forms currently in use are listed below. All forms are available for download at <https://www.nzoa.org.nz/nzjr-implant-forms>.

- NZJR Primary Ankle Replacement
- NZJR Primary Cervical Disc Replacement
- NZJR Primary Elbow Replacement
- NZJR Primary Replacement Hand
- NZJR Primary Hip Replacement
- NZJR Primary Knee Replacement
- NZJR Primary Lumbar Disc Replacement
- NZJR Primary Shoulder Replacement
- NZJR Primary Replacement Wrist
- NZJR Revision Re-Operation Ankle Joint Replacement
- NZJR Revision Re-Operation Cervical Disc Replacement
- NZJR Revision Re-Operation Elbow Joint
- NZJR Revision Re-Operation Hip
- NZJR Revision Re-Operation Replacement Hand
- NZJR Revision Re-Operation Knee Joint
- NZJR Revision Re-Operation Lumbar Disc Replacement
- NZJR Revision Re-Operation Shoulder
- NZJR Revision Re-Operation Replacement Wrist
- NZJR Joint Registry Form Additional Label Page

VERSION: AP NOV 2020

PRIMARY ANKLE REPLACEMENT


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:
X

FUNDING ACC Private DHB DHB Outsourced

PREVIOUS OPERATION ON INDEX JOINT [TICK ALL THAT APPLY]

- None
- Internal fixation for juxtarticular fracture
- Arthrodesis
- Ligament reconstruction
- Subjacent fusion
- Other [SPECIFY]...

DIAGNOSIS

- Post fracture
- Osteoarthritis
- Rheumatoid arthritis / other inflammatory
- AVN
- Instability
- Other [SPECIFY]...

X-RAY

- Concentric or mild deformity
- >10 degrees varus
- >10 degrees valgus

PRIMARY SURGEON

- Consultant
- Advanced trainee supervised
- Advanced trainee unsupervised

CONCURRENT SURGERY [TICK ALL THAT APPLY]

- Achilles or calf lengthening
- Ligament reconstruction: medial or lateral
- Hindfoot fusion or osteotomy
- Midfoot fusion or osteotomy

APPROACH [TICK ALL THAT APPLY]

- Anterior
- Lateral
- Patient specific instrument
- Computer Navigation
- Robotic

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

- Cephazolin
- Other [SPECIFY]...

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Tibia Yes No

Talus Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Tibia

Please do not fold placed stickers
bar coded label

Talus

Please do not fold placed stickers
bar coded label

Bearing

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: CP NOV 2020

PRIMARY CERVICAL DISC REPLACEMENT


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

LEVELS OF DISC REPLACEMENT

- C 3/4
- C 4/5
- C 5/6
- C 6/7
- C 7/T1
- Other [SPECIFY]...

PREVIOUS OPERATION

- Foreminotomy
- Adjacent Level Fusion
- Adjacent Level Disc Arthroplasty
- Other [SPECIFY]...

DIAGNOSIS

- Acute Disc Prolapse
- Chronic Spondylosis
- Neck Pain
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant Adv Trainee Unsupervised Adv Trainee Supervised Basic Trainee

APPROACH [TICK ALL THAT APPLY]

- Anterior - Right
- Anterior - Left
- Other [SPECIFY]...

INTRAOPERATIVE COMPLICATIONS

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____

Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: EP NOV 2020

PRIMARY ELBOW REPLACEMENT


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

PREVIOUS OPERATION ON INDEX JOINT [TICK ALL THAT APPLY]

- None
- Internal fixation for juxtarticular fracture
- Ligament reconstruction
- Interposition arthroplasty
- Debridement
- Synovectomy + removal radial head
- Osteotomy
- Other [SPECIFY]...

DIAGNOSIS

- Osteoarthritis
- Rheumatoid arthritis / other inflammatory
- Tumour
- Post fracture
- Post ligament disruption
- Post dislocation
- Other [SPECIFY]...

CLASS

- Hemiarthroplasty (distal humerus replacement)
- Radial head replacement
- Radiocapitellar replacement
- Total Ulnohumeral replacement (unconstrained/linked)
- Total Ulnohumeral replacement (semiconstrained/linked)

APPROACH [TICK ALL THAT APPLY]

- Medial
- Lateral
- Posterior

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised
- Adv Trainee Supervised
- Basic Trainee

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Humerus Yes No

Ulna Yes No

Radial Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Humerus

Please do not fold placed stickers
bar coded label

Ulna

Please do not fold placed stickers
bar coded label

Radial Head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: HP APR 2021

PRIMARY REPLACEMENT HAND (THUMB OR FINGER: CMCJ, MCPJ, PIPJ)


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

FOR SIMULTANEOUS REPLACEMENT OF MULTIPLE JOINTS WITH THE SAME IMPLANT AND TECHNIQUE IN THE SAME HAND, 1 FORM CAN BE COMPLETED, OTHERWISE SEPARATE FORMS REQUIRED.

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

JOINT REPLACED HAND

<p>FINGER - MCPJ</p> <p><input type="radio"/> Index</p> <p><input type="radio"/> Middle</p> <p><input type="radio"/> Ring</p> <p><input type="radio"/> Little</p> <p>THUMB</p> <p><input type="radio"/> CMCJ</p> <p><input type="radio"/> MCPJ</p>	<p>FINGER - PIPJ</p> <p><input type="radio"/> Index</p> <p><input type="radio"/> Middle</p> <p><input type="radio"/> Ring</p> <p><input type="radio"/> Little</p>
--	--

PREVIOUS OPERATION ON INDEX JOINT

None
 ORIF
 Ligament reconstruction
 Interposition arthroplasty
 Debridement
 Synvectomy
 Osteotomy
 Other [SPECIFY]...

DIAGNOSIS

<p><input type="radio"/> Osteoarthritis</p> <p><input type="radio"/> Rheumatoid arthritis</p> <p><input type="radio"/> Other inflammatory</p>	<p><input type="radio"/> Post fracture</p> <p><input type="radio"/> Post ligament disruption</p> <p><input type="radio"/> Other [SPECIFY]...</p>
---	--

PRIMARY SURGEON

Consultant Adv Trainee Unsupervised

APPROACH [TICK ALL THAT APPLY]

Volar
 Dorsal
 Lateral

PROSTHESIS TYPE

Silicone
 Surface replacement
 Pyrocarbon
 Other [SPECIFY]...

FIXATION

<p>PROXIMAL IMPLANT</p> <p><input type="radio"/> Cemented</p> <p><input type="radio"/> Uncemented</p>	<p>DISTAL IMPLANT</p> <p><input type="radio"/> Cemented</p> <p><input type="radio"/> Uncemented</p>
--	--

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

Conventional
 Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
 Finish Skin Time: _____

SURGEON ATTIRE

Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
 Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Hand - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: HP NOV 2020

PRIMARY HIP REPLACEMENT

TOTAL HIP ARTHROPLASTY RESURFACING ARTHROPLASTY HEMIARTHROPLASTY

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE **THEATRE NO.**

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT
[IF DIFFERENT FROM PATIENT LABEL]

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING

ACC

Private

DHB

DHB Outsourced

PREVIOUS OPERATION ON INDEX JOINT [TICK ALL THAT APPLY]

- None
- Hip Arthroscopy
- Internal fixation for juxtarticular fracture
- Osteotomy
- Other [SPECIFY]...

DIAGNOSIS

- Osteoarthritis
- Rheumatoid arthritis/other inflammatory
- Acute fracture NOF
- Old fracture NOF
- Avascular necrosis
- Developmental dysplasia / Congenital dislocation
- Tumour
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Posterior
- Anterior
- Superior
- Lateral
- Trans-trochanteric (osteotomy)

SURGICAL ADJUNCTS [TICK IF USED]

- Computer Navigation
- Robotic assisted

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised
- Adv Trainee Supervised
- Basic Trainee

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Femur Yes No

Acetabulum Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Femur

Please do not fold placed stickers
bar coded label

Acetabulum

Please do not fold placed stickers
bar coded label

Femoral head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: KP NOV 2020

PRIMARY KNEE REPLACEMENT

TOTAL KNEE UNICOMPARTMENTAL - MEDIAL OR LATERAL PATELLOFEMORAL

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

PREVIOUS OPERATION ON INDEX JOINT [TICK ALL THAT APPLY]

- None
- Osteotomy
- Ligament reconstruction
- Meniscectomy
- Internal fixation for juxtarticular fracture
- Synovectomy
- Other [SPECIFY]...

DIAGNOSIS

- Osteoarthritis
- Rheumatoid arthritis/other inflammatory
- Post ligament - disruption/reconstruction
- Post fracture
- Avascular necrosis
- Tumour
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Medial parapatellar
- Lateral parapatellar
- Tibial tubercle osteotomy
- Other [EG EXTENSILE MEASURES]...

SURGICAL ADJUNCTS [TICK IF USED]

- Computer Navigation
- Robotic assisted
- Patient specific cutting guides

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised
- Adv Trainee Supervised
- Basic Trainee

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Femur Yes No

Tibia Yes No

Patella Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Femur

Please do not fold placed stickers
bar coded label

Tibia

Please do not fold placed stickers
bar coded label

Patella

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: LP NOV 2020

PRIMARY LUMBAR DISC REPLACEMENT


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:
X

FUNDING ACC Private DHB DHB Outsourced

LEVELS OF DISC REPLACEMENT

- L 3/4
- L 4/5
- L 5/S1

LEVELS OF FUSION

- L 3/4
- L 4/5
- L 5/S1

PREVIOUS OPERATION

- Discectomy L 3/4 L 4/5 L 5/S1
- Other L 3/4 L 4/5 L 5/S1 [SPECIFY]...
- Other [SPECIFY]...

DIAGNOSIS

- Degenerative Disc disease
L 3/4 L 4/5 L 5/S1 [PLAIN X-RAY CHANGES PRESENT]
Other [SPECIFY]...
- Annular tear MRI scan
L 3/4 L 4/5 L 5/S1 [NORMAL PLAIN X-RAY]
Other [SPECIFY]...
- Discogenic pain on discography
L 3/4 L 4/5 L 5/S1
Other [SPECIFY]...

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised
- Adv Trainee Supervised
- Basic Trainee

APPROACH [TICK ALL THAT APPLY]

- Retroperitoneal midline abdominal wall incision
- Retroperitoneal lateral abdominal wall incision
- Transperitoneal
- Other [SPECIFY]...

INTRAOPERATIVE COMPLICATIONS

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: SF NOV 2020

PRIMARY SHOULDER REPLACEMENT

- TOTAL SHOULDER ARTHROPLASTY HEMIARTHROPLASTY REVERSE SHOULDER

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

PREVIOUS OPERATION ON INDEX JOINT [TICK ALL THAT APPLY]

- None
- Rotator Cuff Repair
- Previous stabilisation
- Internal fixation for juxtarticular fracture
- Superior capsular reconstruction
- Arthroscopic debridement/decompression
- Other [SPECIFY]...

DIAGNOSIS

- Osteoarthritis
- Rheumatoid arthritis/other inflammatory
- Cuff tear arthropathy
- Massive cuff tear without arthritis
- Acute fracture proximal humerus
- Post old trauma
- Avascular necrosis
- Post recurrent dislocation
- Tumour
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Deltopectoral
- Navigation
- Patient specific instrumentation
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant Adv Trainee Unsupervised Adv Trainee Supervised Basic Trainee

HUMERAL STEM TYPE

- Standard
- Stemless
- Short/metaphyseal stem

STRUCTURAL BONE GRAFT GLENOID

- Allograft Autograft

GLENOID MORPHOLOGY

<input type="radio"/> A1	<input type="radio"/> B1	<input type="radio"/> C
<input type="radio"/> A2	<input type="radio"/> B2	<input type="radio"/> D
<input type="radio"/> B3		

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Humerus Yes No

Glenoid Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Humerus

Please do not fold placed stickers
bar coded label

Glenoid

Please do not fold placed stickers
bar coded label

Humeral Head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: WP APR 2021

PRIMARY REPLACEMENT WRIST (WRIST, DRUJ)


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:
X

FUNDING ACC Private DHB DHB Outsourced

JOINT REPLACED WRIST

- WRIST
- Partial
- Total
- DRUJ
- Partial / Ulna Head
- Total

PREVIOUS OPERATION ON INDEX JOINT

- None
- ORIF
- Ligament reconstruction
- Interposition arthroplasty
- Debridement
- Synvectomy
- Osteotomy
- Other [SPECIFY]...

DIAGNOSIS

- Osteoarthritis
- Rheumatoid arthritis
- Other inflammatory
- Post fracture
- Post ligament disruption
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant Adv Trainee Unsupervised Adv Trainee Supervised Basic Trainee

ASSOCIATED PROCEDURES [SOFT TISSUE OR BONE]

- Yes [SPECIFY]...
- _____
- _____
- _____

FIXATION

PROXIMAL IMPLANT

- Cemented
- Uncemented

DISTAL IMPLANT

- Cemented
- Uncemented

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Wrist - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: AR NOV 2020

REVISION / RE-OPERATION ANKLE JOINT REPLACEMENT

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/
IF RE-REVISION PREVIOUS DATE	/	/

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING

ACC

Private

DHB

DHB Outsourced

DIAGNOSIS [TICK ALL THAT APPLY]

- Impingement
- Osteolysis: Talus or Tibia
- Pain with no obvious cause
- Subjacent arthritis
- Bearing failure: wear or fracture
- Failure to osseointegrate
- Periprosthetic #
- Deep infection
- Malalignment
- Subsidence: Talus or Tibia
- Other [SPECIFY]..

REVISION PROCEDURE [TICK ALL THAT APPLY]

- Bearing exchange only
- Amputation
- Extraction +/- cement spacer
- Fusion: TT or TTC
- Tibia: standard revision custom allograft composite
- Talus: standard revision custom allograft composite
- Additional procedures [SPECIFY]...

PRIMARY SURGEON

- Consultant
- Advanced trainee supervised
- Advanced trainee unsupervised

RE-OPERATION PROCEDURE [TICK ALL THAT APPLY]

- Tendon surgery
- Subjacent Fusions [SPECIFY]..
- Debridement for infection +/- bearing exchange for access
- Debridement for impingement: open or arthroscopic
- Ligament reconstruction: medial or lateral
- ORIF Peri prosthetic #
- Grafting of cysts: with bearing exchange
- Osteotomy [SPECIFY]..
- Other [SPECIFY]..

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

- Cephazolin
- Other [SPECIFY]..

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Tibia Yes No

Talus Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Tibia

Please do not fold placed stickers
bar coded label

Talus

Please do not fold placed stickers
bar coded label

Bearing

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: CR NOV 2020

REVISION / RE-OPERATION CERVICAL DISC REPLACEMENT

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
-------------	--------------------

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]
--

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]
--

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



<input type="radio"/> LEFT - SIDE - RIGHT <input type="radio"/>
IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/
-------------------------	---	---

IF RE-REVISION PREVIOUS DATE	/	/
------------------------------	---	---

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING	<input type="radio"/> ACC	<input type="radio"/> Private	<input type="radio"/> DHB	<input type="radio"/> DHB Outsourced
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LEVELS OF REVISION

- C 3/4
- C 4/5
- C 5/6
- C 6/7
- C 7/T1
- Other [SPECIFY]...

REASON FOR REVISION

- Dislocation of component
- Failure of component
- Adjacent level surgery
- Additional decompression required
- Heterotopic calcification
- Infection
- Pain (neck)
- Other [SPECIFY]...

REVISION

- Replace disc prosthesis (same)
- Replace disc prosthesis (different)
- Removal only
- Fuse
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Computer Navigation
- Trans-trochanteric
- Minimally invasive surgery
- Anterior
- Posterior
- Lateral

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised
- Adv Trainee Supervised
- Basic Trainee

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: ER NOV 2020

REVISION / RE-OPERATION ELBOW JOINT

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.	HOSPITAL NAME
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]		<p>STICK PATIENT LABEL HERE</p> <p>PLEASE PLACE IMPLANT LABELS ON THE REVERSE</p>
BMI		
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]		
<input type="radio"/> LEFT - SIDE - RIGHT <input type="radio"/> IF BILATERAL THEN DO SEPARATE FORMS		
DATE OF INDEX OPERATION / /		<p>SURGEON TO CHECK & SIGN PLEASE →</p> <p>Surgeon to sign here: X</p>
IF RE-REVISION PREVIOUS DATE / /		
<p>FUNDING <input type="radio"/> ACC <input type="radio"/> Private <input type="radio"/> DHB <input type="radio"/> DHB Outsourced</p>		

REVISION PROCEDURE [TICK ALL THAT APPLY]

- Change of humeral component
- Change of ulnar component
- Change of radial head component
- Change of all components
- Removal of components
- Other [SPECIFY]...

REASON FOR REVISION

- Loosening humeral component
- Loosening ulnar component
- Loosening radial head component
- Unexplained pain
- Deep infection
- Fracture humerus
- Fracture ulna
- Dislocations
- Other [SPECIFY]...

IF RE-OPERATION ONLY
[NO COMPONENT ADDED, CHANGED OR REMOVED - SPECIFY PROCEDURE]

- Closed reduction of dislocation
- Open reduction of dislocation
- Treatment deep infection
- Superficial wound procedure
- MUA

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised

CLASS

- Hemiathroplasty (distal humerus replacement)
- Radial head replacement
- Radiocapitellar replacement
- Total Ulnohumeral replacement (unconstrained/linked)
- Total Ulnohumeral replacement (semiconstrained/linked)

APPROACH [TICK ALL THAT APPLY]

- Medial
- Lateral
- Posterior

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE **OPERATING TIME**

- | | |
|---|-------------------------|
| <input type="radio"/> Conventional | Start Skin Time: _____ |
| <input type="radio"/> Laminar Flow or similar | Finish Skin Time: _____ |

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Humerus Yes No

Ulna Yes No

Radial Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Humerus

Please do not fold placed stickers
bar coded label

Ulna

Please do not fold placed stickers
bar coded label

Radial Head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: HR NOV 2020

REVISION / RE-OPERATION HIP


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/
IF RE-REVISION PREVIOUS DATE	/	/

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

PROCEDURE PERFORMED [TICK ALL THAT APPLY]

- Change of all components
- Change of femoral component
- Change of acetabular shell
- Change of liner
- Change of head
- Removal of components only (Girdlestone)
- No components added, exchanged, or removed - re-operation only

REASON FOR THIS REVISION
[TICK ALL THAT APPLY] [REVISION = COMPONENT ADDED, CHANGED, OR REMOVED]

- Deep infection
- Loosening acetabular component
- Loosening femoral component
- Dislocation/instability
- Fracture femur
- Failed hemiarthroplasty
- Poly wear
- Unexplained pain
- Other [SPECIFY]...

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

PRIMARY SURGEON

- Consultant
- Adv Trainee Unsupervised

IF RE-OPERATION ONLY
[NO COMPONENT ADDED, CHANGED OR REMOVED - SPECIFY PROCEDURE]

- Debridement / Lavage for deep infection
- Closed reduction of dislocation
- Open reduction of dislocation
- Haematoma Evacuation
- Superficial wound procedure
- Bone Grafting Lytic lesion only
- ORIF of periprosthetic fracture
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Posterior
- Anterior
- Lateral
- Trans-trochanteric (osteotomy)

SURGICAL ADJUNCTS [TICK IF USED]

- Computer Navigation
- Robotic assisted

OPERATING THEATRE **OPERATING TIME**

- | | |
|---|-------------------------|
| <input type="radio"/> Conventional | Start Skin Time: _____ |
| <input type="radio"/> Laminar Flow or similar | Finish Skin Time: _____ |

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Femur Yes No

Acetabulum Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Femur

Please do not fold placed stickers
bar coded label

Acetabulum

Please do not fold placed stickers
bar coded label

Femoral head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: HR APR 2021

REVISION / REOPERATION REPLACEMENT HAND (THUMB OR FINGER: CMCJ, MCPJ, PIPJ)

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE

LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS
 AN INDIVIDUAL FORM IS REQUIRED FOR EACH JOINT REVISED

DATE OF INDEX OPERATION	/	/	
IF RE-REVISION PREVIOUS DATE	/	/	

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here: **X**

FUNDING ACC Private DHB DHB Outsourced

JOINT REVISED - HAND [INCLUDING IF JOINT FUSED]

FINGER - MCPJ	FINGER - PIPJ
<input type="radio"/> Index	<input type="radio"/> Index
<input type="radio"/> Middle	<input type="radio"/> Middle
<input type="radio"/> Ring	<input type="radio"/> Ring
<input type="radio"/> Little	<input type="radio"/> Little

THUMB

CMCJ

MCPJ

REASON FOR REVISION

Infection

Aseptic loosening

Trauma - Fracture

Dislocation

Pain

Implant fracture

Other [SPECIFY]...

ASSOCIATED PROCEDURES [SOFT TISSUE OR BONE]

Yes [SPECIFY]...

PRIMARY SURGEON

Consultant Adv Trainee Unsupervised

APPROACH [TICK ALL THAT APPLY]

Volar

Dorsal

Lateral

PROSTHESIS TYPE

Silicone

Surface replacement

Pyrocarbon

Other [SPECIFY]...

FIXATION

PROXIMAL IMPLANT	DISTAL IMPLANT
<input type="radio"/> Cemented	<input type="radio"/> Cemented
<input type="radio"/> Uncemented	<input type="radio"/> Uncemented

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE **OPERATING TIME**

<input type="radio"/> Conventional	Start Skin Time: _____
<input type="radio"/> Laminar Flow or similar	Finish Skin Time: _____

SURGEON ATTIRE

Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown

Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Hand - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: KR NOV 2020

REVISION / RE-OPERATION KNEE JOINT


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/
IF RE-REVISION PREVIOUS DATE	/	/

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

REVISION PROCEDURE PERFORMED [MORE THAN ONE MAY APPLY]

- Change of all components
- Change of femoral component
- Change of tibial component
- Change of tibial polyethylene only
- Change of patellar component
- Addition of patellar component
- Removal of all components only
- No components added or changed - re-operation only
- Other [SPECIFY]...

REASON FOR THIS REVISION [TICK ALL THAT APPLY]

- Deep infection
- Loosening femoral component
- Loosening patellar component
- Loosening tibial component
- Failed unicompartmental
- Wear in non-replaced compartment
- Periprosthetic Fracture Femur Tibia
- Poly wear
- Stiffness/Arthrofibrosis
- Instability
- Unexplained pain
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant
 Adv Trainee Unsupervised
 Adv Trainee Supervised
 Basic Trainee

IF RE-OPERATION ONLY [NO COMPONENT ADDED, CHANGED OR REMOVED]

- Debridement / Lavage for deep infection
- Manipulation under anaesthetic
- Superficial wound procedure
- ORIF Periprosthetic Fracture
- Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]

- Medial parapatellar
- Lateral parapatellar
- Tibial tubercle osteotomy
- Other [EG EXTENSILE MEASURES]...

SURGICAL ADJUNCTS [TICK IF USED]

- Computer Navigation
- Robotic assisted
- Patient specific cutting guides

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Femur Yes No

Tibia Yes No

Patella Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Femur

Please do not fold placed stickers
bar coded label

Tibia

Please do not fold placed stickers
bar coded label

Patella

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: LR NOV 2020

REVISION / RE-OPERATION LUMBAR DISC REPLACEMENT

NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE

LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/	
IF RE-REVISION PREVIOUS DATE	/	/	

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here: **X**

FUNDING ACC Private DHB DHB Outsourced

REASON FOR REVISION

- Loosening of components
- Dislocation of articulating core
- Loss of spinal alignment
- Fracture of vertebra
- Deep infection
- Removal of components
- Pain
- Other [SPECIFY]...

REVISION

- Change of TDR components
- Change to Anterior Fusion
- Change of articulating core
- In-situ posterior instrumented fusion

LEVELS OF DISC REPLACEMENT

- L 3/4
- L 4/5
- L 5/S1

LEVELS OF FUSION

- L 3/4
- L 4/5
- L 5/S1

PRIMARY SURGEON

- Consultant Adv Trainee Unsupervised Adv Trainee Supervised Basic Trainee

APPROACH [TICK ALL THAT APPLY]

- Retroperitoneal midline abdominal wall incision
- Retroperitoneal lateral abdominal wall incision
- Posterior Approach for in-situ fusion
- Transperitoneal
- Other [SPECIFY]...

INTRAOPERATIVE COMPLICATIONS

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____

Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

Implants

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: SR NOV 2020

REVISION / RE-OPERATION SHOULDER


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/	
IF RE-REVISION PREVIOUS DATE	/	/	

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here: **X**

FUNDING ACC Private DHB DHB Outsourced

REVISION PROCEDURE [TICK ALL THAT APPLY]

- Change of all components
- Change of glenoid component
- Change of humeral component
- Change of liner
- Change of head only
- Removal of components only (with or without spacer insertion)
- Removal only humerus component
- Removal only glenoid component
- Conversion procedure [SPECIFY]...
- No components added or changed - re-operation only
- Other [SPECIFY]...

REASON FOR THIS REVISION [TICK ALL THAT APPLY]

- Deep infection
- Loosening glenoid component
- Loosening humeral component
- Dislocation/instability anterior
- Instability posterior
- Rotator cuff impingement/failure
- Fracture humerus
- Implant breakage/dissociation
- Glenoid erosion
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant
 Adv Trainee Unsupervised
 Adv Trainee Supervised
 Basic Trainee

IF RE-OPERATION ONLY

[NO COMPONENT ADDED, CHANGED OR REMOVED - SPECIFY PROCEDURE]

- Closed reduction of dislocation
- Debridement / Lavage for deep infection
- MUA
- Open reduction of dislocation
- Superficial wound procedure
- Subscapular repair

APPROACH [TICK ALL THAT APPLY]

- Deltpectoral
- Patient specific instrument
- Other [SPECIFY]...

BONE GRAFT

- Allograft Autograft

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____
Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Cement [IF MORE THAN ONE MIX IS USED ONLY ONE CEMENT STICKER IS REQUIRED]

Humerus Yes No

Glenoid Yes No

PLACE CEMENT STICKER OR COMPLETE

Cement Name:

Cement Antibiotic (if present):

Humerus

Please do not fold placed stickers
bar coded label

Glenoid

Please do not fold placed stickers
bar coded label

Humeral Head

Please do not fold placed stickers
bar coded label

Augments

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

VERSION: WR APR 2021

REVISION / REOPERATION REPLACEMENT WRIST (WRIST, DRUJ)


NEW ZEALAND JOINT REGISTRY - DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE	THEATRE NO.
ASA CLASS 1 2 3 4 [PLEASE CIRCLE]	
BMI	
CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]	

HOSPITAL NAME

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT LABELS ON THE REVERSE



LEFT - SIDE - RIGHT
 IF BILATERAL THEN DO SEPARATE FORMS

DATE OF INDEX OPERATION	/	/	
IF RE-REVISION PREVIOUS DATE	/	/	

SURGEON TO CHECK & SIGN PLEASE →

Surgeon to sign here:

X

FUNDING ACC Private DHB DHB Outsourced

JOINT REVISED WRIST

- WRIST
- Partial
- Total
- Fusion [SPECIFY]...
- Other [SPECIFY]...
- DRUJ
- Partial / Ulna Head
- Total
- Excision
- Other [SPECIFY]...

REASON FOR REVISION

- Infection
- Aseptic loosening
- Trauma - Fracture
- Dislocation
- Pain
- Implant fracture
- Other [SPECIFY]...

PRIMARY SURGEON

- Consultant Adv Trainee Unsupervised Adv Trainee Supervised Basic Trainee

ASSOCIATED PROCEDURES [SOFT TISSUE OR BONE]

Yes [SPECIFY]...

FIXATION

PROXIMAL IMPLANT

- Cemented
- Uncemented

DISTAL IMPLANT

- Cemented
- Uncemented

SYSTEMIC ANTIBIOTIC PROPHYLAXIS

NAME: _____

OPERATING THEATRE

- Conventional
- Laminar Flow or similar

OPERATING TIME

Start Skin Time: _____

Finish Skin Time: _____

SURGEON ATTIRE

- Space Suits/Helmet Fan: One-piece Toga or Sterile Hood and Gown
- Conventional Gown

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

Wrist - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

STICK ADDITIONAL THEATRE LABELS HERE IF REQUIRED

DO NOT PLACE IN PATIENT NOTES - TO BE RETAINED IN THEATRE SUITE

DATE

LEFT - SIDE - RIGHT
IF BILATERAL THEN DO SEPARATE FORMS

STICK PATIENT LABEL HERE

PLEASE PLACE IMPLANT
LABELS ON THE REVERSE



A large, empty rectangular box intended for pasting patient labels.

PLEASE STAPLE TO ORIGINAL FORM

Manchester-Oxford Foot Questionnaire (MOxFQ)

Circle as appropriate **Right / Left**

Full Name _____

Please tick (✓) one for each statement

1. During the past 4 weeks this has applied to me:

I have pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

2. During the past 4 weeks this has applied to me:

I avoid walking long distances because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

3. During the past 4 weeks this has applied to me:

I change the way I walk due to pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

4. During the past 4 weeks this has applied to me:

I walk slowly because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

5. During the past 4 weeks this has applied to me:

I have to stop and rest my foot/ankle because of pain

None of the Time Rarely Some of the time Most of the time All of the time

6. During the past 4 weeks this has applied to me:

I avoid some hard or rough surfaces because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

7. During the past 4 weeks this has applied to me:

I avoid standing for a long time because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

8. During the past 4 weeks this has applied to me:

I catch the bus or use the car instead of walking, because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

9. During the past 4 weeks this has applied to me:

I feel self-conscious about my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

10. During the past 4 weeks this has applied to me:

I feel self-conscious about the shoes I have to wear

None of the Time Rarely Some of the time Most of the time All of the time

11. During the past 4 weeks this has applied to me:

The pain in my foot/ankle is more painful in the evening

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. During the past 4 weeks this has applied to me:

I get shooting pains in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. During the past 4 weeks this has applied to me:

The pain in my foot/ankle prevents me from carrying out my work/everyday activities

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. During the past 4 weeks this has applied to me:

I am unable to do all my social or recreational activities because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. During the past 4 weeks....

How would you describe the pain you usually have in your foot/ankle?

None	Very mild	Mild	Moderate	Severe
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. During the past 4 weeks....

Have you been troubled by pain from your foot/ankle in bed at night?

No nights	Only 1 or 2 nights	Some nights	Most nights	Every night
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Finally, please check that you have answered every question.
Thank you very much.



Patient Rated Wrist/Hand Evaluation Form

Full Name:	
ACC Number:	
Today's Date:	

The questions below will help us understand how much difficulty you have had with your wrist/hand in the past week

- You will be describing your **average** wrist/hand symptoms **over the past week** on a scale of 0-10
- Please provide an answer for **all** questions
- If you did not perform an activity, please **estimate** the pain or difficulty you would expect

1. Pain

Rate the average amount of pain in your wrist/hand over the past week by selecting the number that best describes your pain on a scale from 0-10

- A zero (0) means that you did not have any pain
- A ten (10) means that the pain is the worst possible (i.e. worst you have ever experienced or that you could not do the activity because of pain)
- If you are unable to use your hand because it is immobilised or movement is prohibited, score 10

Please rate your pain on the scale below (0 = none, 10 = worst)

At rest	0	1	2	3	4	5	6	7	8	9	10
When doing a task with a repeated wrist/hand movement	0	1	2	3	4	5	6	7	8	9	10
When lifting a heavy object	0	1	2	3	4	5	6	7	8	9	10
When it is at its worst	0	1	2	3	4	5	6	7	8	9	10
How often do you have pain? (0 = never, 10 = always)	0	1	2	3	4	5	6	7	8	9	10

Please turn over...



Patient Rated Wrist/Hand Evaluation Form

2. Function

Rate the **amount of difficulty** you experienced performing each of the items below – over the past week

- A zero (0) means that you did not experience any difficulty
- A ten (10) means it was so difficult you were unable to do it at all

Rate your difficulty (0 = no difficulty, 10 = unable to do)

A. Specific Activities

Turn a door knob using my affected hand	0	1	2	3	4	5	6	7	8	9	10
Cut food using a knife in my affected hand	0	1	2	3	4	5	6	7	8	9	10
Fasten buttons on my shirt	0	1	2	3	4	5	6	7	8	9	10
Use my affected hand to push up from a chair	0	1	2	3	4	5	6	7	8	9	10
Carry a 5kg object in my affected hand	0	1	2	3	4	5	6	7	8	9	10
Use toilet tissue with my affected hand	0	1	2	3	4	5	6	7	8	9	10

B. Usual Activities

Personal care activities (dressing, washing)	0	1	2	3	4	5	6	7	8	9	10
Household work (cleaning, maintenance)	0	1	2	3	4	5	6	7	8	9	10
Work (your job or usual everyday work)	0	1	2	3	4	5	6	7	8	9	10
Recreational activities	0	1	2	3	4	5	6	7	8	9	10

Any other comments?

NECK DISABILITY INDEX (NDI) QUESTIONNAIRE

Patient Name:

Date of Birth:

Patient Address:

Operating Surgeon:

.....

Date of Surgery:

Please answer every section. Mark **one box only** in each section that most closely describes you today.

<p>Section 1: Pain Intensity</p> <ul style="list-style-type: none"> <input type="checkbox"/> I have no pain at the moment. <input type="checkbox"/> The pain is very mild at the moment. <input type="checkbox"/> The pain is moderate at the moment. <input type="checkbox"/> The pain is fairly severe at the moment. <input type="checkbox"/> The pain is very severe at the moment. <input type="checkbox"/> The pain is the worst imaginable at the moment. <p>Section 2: Personal Care (Washing, Dressing, etc)</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can look after myself normally, without causing extra pain. <input type="checkbox"/> I can look after myself normally, but it causes extra pain. <input type="checkbox"/> It is painful to look after myself and I am slow and careful. <input type="checkbox"/> I need some help, but manage most of my personal care. <input type="checkbox"/> I need help every day in most aspects of self care. <input type="checkbox"/> I do not get dressed, I wash with difficulty and stay in bed. <p>Section 3: Lifting</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can lift heavy weights without extra pain. <input type="checkbox"/> I can lift heavy weights, but it gives extra pain. <input type="checkbox"/> Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example, on a table. <input type="checkbox"/> Pain prevents me from lifting heavy weights off the floor, but I can manage light to medium weights if they are conveniently positioned. <input type="checkbox"/> I can lift very light weights. <input type="checkbox"/> I cannot lift or carry anything at all. <p>Section 4: Reading</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can read as much as I want to with no pain in my neck. <input type="checkbox"/> I can read as much as I want to with slight pain in my neck. <input type="checkbox"/> I can read as much as I want to with moderate pain in my neck. <input type="checkbox"/> I can't read as much as I want because of moderate pain in my neck. <input type="checkbox"/> I can hardly read at all because of severe pain in my neck. <input type="checkbox"/> I cannot read at all. <p>Section 5: Headaches</p> <ul style="list-style-type: none"> <input type="checkbox"/> I have no headaches at all. <input type="checkbox"/> I have slight headaches which come infrequently. <input type="checkbox"/> I have moderate headaches which come infrequently. <input type="checkbox"/> I have moderate headaches which come frequently. <input type="checkbox"/> I have severe headaches which come frequently. <input type="checkbox"/> I have headaches almost all the time. 	<p>Section 6: Concentration</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can concentrate fully when I want to, with no difficulty. <input type="checkbox"/> I can concentrate fully when I want to, with slight difficulty. <input type="checkbox"/> I have a fair degree of difficulty in concentrating when I want to. <input type="checkbox"/> I have a lot of difficulty in concentrating when I want to. <input type="checkbox"/> I have a great deal of difficulty in concentrating when I want to. <input type="checkbox"/> I cannot concentrate at all. <p>Section 7: Work</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can do as much work as I want to. <input type="checkbox"/> I can only do my usual work, but no more. <input type="checkbox"/> I can do most of my usual work, but no more. <input type="checkbox"/> I cannot do my usual work. <input type="checkbox"/> I can hardly do any work at all. <input type="checkbox"/> I can't do any work at all. <p>Section 8: Driving</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can drive my car without any neck pain. <input type="checkbox"/> I can drive my car as long as I want, but with slight neck pain. <input type="checkbox"/> I can drive my car as long as I want, but with moderate neck pain. <input type="checkbox"/> I can't drive my car as long as I want because of moderate pain in my neck. <input type="checkbox"/> I can hardly drive at all because of severe pain in my neck. <input type="checkbox"/> I can't drive my car at all. <p>Section 9: Sleeping</p> <ul style="list-style-type: none"> <input type="checkbox"/> I have no trouble sleeping. <input type="checkbox"/> My sleep is slightly disturbed (less than 1 hour sleepless). <input type="checkbox"/> My sleep is mildly disturbed (1-2 hours sleepless). <input type="checkbox"/> My sleep is moderately disturbed (2-3 hours sleepless). <input type="checkbox"/> My sleep is greatly disturbed (3-5 hours sleepless). <input type="checkbox"/> My sleep is completely disturbed (5-7 hours sleepless). <p>Section 10: Recreation</p> <ul style="list-style-type: none"> <input type="checkbox"/> I am able to engage in all my recreation activities, with no neck pain at all. <input type="checkbox"/> I am able to engage in all my recreation activities, with some pain in my neck. <input type="checkbox"/> I am able to engage in most, but not all, of my usual recreation activities because of pain in my neck. <input type="checkbox"/> I am able to engage in only a few of my usual recreation activities because of pain in my neck. <input type="checkbox"/> I can hardly do any recreation activities because of pain in my neck. <input type="checkbox"/> I can't do any recreation activities at all.
--	--



REVISION ELBOW REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.

LEFT
←
PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021
→
RIGHT

If your surgery was bilateral, you will need to complete a questionnaire for each side

1. Have you had difficulty lifting things in your home, such as putting out the rubbish, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

2. Have you had difficulty carrying bags of shopping, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

3. Have you had any difficulty washing yourself all over, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

4. Have you had any difficulty dressing yourself, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

5. Have you felt that your elbow problem is "controlling your life"?

④
No, not at all
③
Occasionally
②
Some days
①
Most days
①
Every day

6. How much has your elbow problem "been on your mind"?

④
Not at all
③
A little of the time
②
Some of the time
①
Most of the time
①
All of the time

7. Have you been troubled by pain from your elbow in bed at night?

④
Not at all
③
1-2 nights
②
Some nights
①
Most nights
①
Every night

8. How often has your elbow pain interfered with your sleeping?

④
Not at all
③
Occasionally
②
Some of the time
①
Most of the time
①
All of the time

9. How much has your elbow problem interfered with your usual work or everyday activities?

④
Not at all
③
A little
②
Moderately
①
Greatly
①
Totally

10. Has your elbow problem limited your ability to take part in leisure activities that you enjoy doing?

④
No, not at all
③
Occasionally
②
Some of the time
①
Most of the time
①
All of the time

11. How would you describe the worst pain you have from your elbow?

④
No pain
③
Mild pain
②
Moderate pain
①
Severe pain
①
Unbearable

12. How would you describe the pain you usually have from your elbow?

④
No pain
③
Mild pain
②
Moderate pain
①
Severe pain
①
Unbearable

Overall, how satisfied are you with the outcome of your elbow surgery?

④
Very satisfied
③
Somewhat satisfied
②
Neutral
①
Somewhat dissatisfied
①
Dissatisfied

REVISION HIP REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.



LEFT	←	PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN <u>July 2021</u> If your surgery was bilateral, you will need to complete a questionnaire for each side	→	RIGHT
-------------	---	--	---	--------------

1. How would you describe the pain you usually have from your operated on hip?

④	③	②	①	①
None	Very mild	Mild	Moderate	Severe

2. For how long have you been able to walk before the pain from your operated on hip becomes severe? (with or without a stick)

④	③	②	①	①
No pain/over 30 minutes	16 to 30 minutes	5 to 15 minutes	Around the house only	Unable, severe pain

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on hip?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

4. Have you been able to put on a pair of socks, stockings or tights?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

5. Could you do the household shopping on your own?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on hip?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

7. How much has pain from your operated on hip interfered with your usual work (including housework)?

④	③	②	①	①
Not at all	A little bit	Moderately	Greatly	Totally

8. After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your operated on hip?

④	③	②	①	①
Not at all painful	Slightly painful	Moderately painful	Very painful	Unbearable

9. Have you had any sudden, severe pain - 'shooting', 'stabbing' or 'spasms' - from the affected operated on hip?

④	③	②	①	①
No days	Only 1 or 2 days	Some days	Most days	Every day

10. Have you been limping when walking, because of your operated on hip?

④	③	②	①	①
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

11. Have you been able to climb a flight of stairs?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

12. Have you been troubled by pain from your operated on hip in bed at night?

④	③	②	①	①
No nights	Only 1 or 2 nights	Some nights	Most nights	Every night

Overall, how satisfied are you with the outcome of your hip surgery?

④	③	②	①	①
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied



REVISION KNEE REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.

← PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021 →

If your surgery was bilateral, you will need to complete a questionnaire for each side

LEFT

RIGHT

1. How would you describe the pain you usually have from your operated on knee?

④	③	②	①	①
None	Very mild	Mild	Moderate	Severe

2. For how long have you been able to walk before the pain from your operated on knee becomes severe? (with or without a stick)

④	③	②	①	①
No pain/over 30 minutes	16 to 30 minutes	5 to 15 minutes	Around the house only	Unable, severe pain

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on knee?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

4. Could you kneel down and get up again afterwards on your operated knee?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

5. Could you do the household shopping on your own?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on knee?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

7. How much has pain from your operated on knee interfered with your usual work (including housework)?

④	③	②	①	①
Not at all	A little bit	Moderately	Greatly	Totally

8. After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your operated on knee?

④	③	②	①	①
Not at all painful	Slightly painful	Moderately painful	Very painful	Unbearable

9. Have you felt that your operated on knee might suddenly "give way" or let you down?

④	③	②	①	①
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

10. Have you been limping when walking, because of your operated on knee?

④	③	②	①	①
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

11. Could you walk down one flight of stairs?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

12. Have you been troubled by pain from your operated on knee in bed at night?

④	③	②	①	①
No nights	Only 1 or 2 nights	Some nights	Most nights	Every night

Overall, how satisfied are you with the outcome of your knee surgery?

④	③	②	①	①
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied

REVISION SHOULDER REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.



LEFT
←
 PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021
→
RIGHT

If your surgery was bilateral, you will need to complete a questionnaire for each side

1. How would you describe the worst pain you have had from your operated on shoulder?

④	③	②	①	①
None	Mild	Moderate	Severe	Unbearable

2. How would you describe the pain you usually have from your operated on shoulder?

④	③	②	①	①
None	Mild	Moderate	Severe	Unbearable

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on shoulder?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

4. Have you been able to use a knife and fork at the same time?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

5. Could you do the household shopping on your own?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

6. Could you carry a tray containing a plate of food across a room?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

7. Could you brush/comb your hair with the operated on arm?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

8. Have you had any trouble dressing yourself because of your operated on shoulder?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

9. Could you hang your clothes up in a wardrobe – using the operated on arm?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

10. Have you been able to wash and dry yourself under both arms?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

11. How much has pain from your operated on shoulder interfered with your usual work hobbies/recreational activities (including housework)?

④	③	②	①	①
Not at all	A little bit	Moderately	Greatly	Totally

12. Have you been troubled by pain from your operated on shoulder in bed at night?

④	③	②	①	①
No nights	Only 1 or 2 nights	Some nights	Most nights	Every night

Overall, how satisfied are you with the outcome of your shoulder surgery?

④	③	②	①	①
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied



PRIMARY KNEE REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.

← PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021 →

If your surgery was bilateral, you will need to complete a questionnaire for each side

LEFT

RIGHT

1. How would you describe the pain you usually have from your operated on knee?

④	③	②	①	①
None	Very mild	Mild	Moderate	Severe

2. For how long have you been able to walk before the pain from your operated on knee becomes severe? (with or without a stick)

④	③	②	①	①
No pain/over 30 minutes	16 to 30 minutes	5 to 15 minutes	Around the house only	Unable, severe pain

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on knee?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

4. Could you kneel down and get up again afterwards on your operated knee?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

5. Could you do the household shopping on your own?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on knee?

④	③	②	①	①
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

7. How much has pain from your operated on knee interfered with your usual work (including housework)?

④	③	②	①	①
Not at all	A little bit	Moderately	Greatly	Totally

8. After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your operated on knee?

④	③	②	①	①
Not at all painful	Slightly painful	Moderately painful	Very painful	Unbearable

9. Have you felt that your operated on knee might suddenly "give way" or let you down?

④	③	②	①	①
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

10. Have you been limping when walking, because of your operated on knee?

④	③	②	①	①
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

11. Could you walk down one flight of stairs?

④	③	②	①	①
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

12. Have you been troubled by pain from your operated on knee in bed at night?

④	③	②	①	①
No nights	Only 1 or 2 nights	Some nights	Most nights	Every night

Overall, how satisfied are you with the outcome of your knee surgery?

④	③	②	①	①
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied

PRIMARY ELBOW REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.



LEFT
←
 PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021
→
RIGHT

If your surgery was bilateral, you will need to complete a questionnaire for each side

1. Have you had difficulty lifting things in your home, such as putting out the rubbish, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

2. Have you had difficulty carrying bags of shopping, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

3. Have you had any difficulty washing yourself all over, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

4. Have you had any difficulty dressing yourself, because of your elbow problem?

④
No difficulty
③
A little bit of difficulty
②
Moderate difficulty
①
Extreme difficulty
①
Impossible to do

5. Have you felt that your elbow problem is "controlling your life"?

④
No, not at all
③
Occasionally
②
Some days
①
Most days
①
Every day

6. How much has your elbow problem "been on your mind"?

④
Not at all
③
A little of the time
②
Some of the time
①
Most of the time
①
All of the time

7. Have you been troubled by pain from your elbow in bed at night?

④
Not at all
③
1-2 nights
②
Some nights
①
Most nights
①
Every night

8. How often has your elbow pain interfered with your sleeping?

④
Not at all
③
Occasionally
②
Some of the time
①
Most of the time
①
All of the time

9. How much has your elbow problem interfered with your usual work or everyday activities?

④
Not at all
③
A little
②
Moderately
①
Greatly
①
Totally

10. Has your elbow problem limited your ability to take part in leisure activities that you enjoy doing?

④
No, not at all
③
Occasionally
②
Some of the time
①
Most of the time
①
All of the time

11. How would you describe the worst pain you have from your elbow?

④
No pain
③
Mild pain
②
Moderate pain
①
Severe pain
①
Unbearable

12. How would you describe the pain you usually have from your elbow?

④
No pain
③
Mild pain
②
Moderate pain
①
Severe pain
①
Unbearable

Overall, how satisfied are you with the outcome of your elbow surgery?

④
Very satisfied
③
Somewhat satisfied
②
Neutral
①
Somewhat dissatisfied
①
Dissatisfied



PRIMARY HIP REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.

LEFT
←
 PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021
→
RIGHT

If your surgery was bilateral, you will need to complete a questionnaire for each side

1. How would you describe the pain you usually have from your operated on hip?

4	3	2	1	0
None	Very mild	Mild	Moderate	Severe

2. For how long have you been able to walk before the pain from your operated on hip becomes severe? (with or without a stick)

4	3	2	1	0
No pain/over 30 minutes	16 to 30 minutes	5 to 15 minutes	Around the house only	Unable, severe pain

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on hip?

4	3	2	1	0
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

4. Have you been able to put on a pair of socks, stockings or tights?

4	3	2	1	0
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

5. Could you do the household shopping on your own?

4	3	2	1	0
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on hip?

4	3	2	1	0
No trouble at all	Very little trouble	Moderate trouble	Extreme difficulty	Impossible to do

7. How much has pain from your operated on hip interfered with your usual work (including housework)?

4	3	2	1	0
Not at all	A little bit	Moderately	Greatly	Totally

8. After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your operated on hip?

4	3	2	1	0
Not at all painful	Slightly painful	Moderately painful	Very painful	Unbearable

9. Have you had any sudden, severe pain - 'shooting', 'stabbing' or 'spasms' - from the affected operated on hip?

4	3	2	1	0
No days	Only 1 or 2 days	Some days	Most days	Every day

10. Have you been limping when walking, because of your operated on hip?

4	3	2	1	0
Rarely/never	Sometimes, or just at first	Often, not just at first	Most of the time	All of the time

11. Have you been able to climb a flight of stairs?

4	3	2	1	0
Yes, easily	With little difficulty	With moderate difficulty	With extreme difficulty	No, impossible

12. Have you been troubled by pain from your operated on hip in bed at night?

4	3	2	1	0
No nights	Only 1 or 2 nights	Some nights	Most nights	Every night

Overall, how satisfied are you with the outcome of your hip surgery?

4	3	2	1	0
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied

PRIMARY SHOULDER REPLACEMENT QUESTIONNAIRE

Please circle the answer which best describes yourself **OVER THE LAST 4 WEEKS**

NB: If there are reasons other than the operation which would stop you doing one of the tasks listed; try to answer the question from the joint replacement aspect alone.



LEFT
←
PLEASE CIRCLE THE SIDE YOUR SURGERY WAS ON IN July 2021
→
RIGHT

If your surgery was bilateral, you will need to complete a questionnaire for each side

1. How would you describe the worst pain you have had from your operated on shoulder?				
④ None	③ Mild	② Moderate	① Severe	① Unbearable
2. How would you describe the pain you usually have from your operated on shoulder?				
④ None	③ Mild	② Moderate	① Severe	① Unbearable
3. Have you had any trouble getting in and out of a car or using public transport because of your operated on shoulder?				
④ No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	① Impossible to do
4. Have you been able to use a knife and fork at the same time?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
5. Could you do the household shopping on your own?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
6. Could you carry a tray containing a plate of food across a room?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
7. Could you brush/comb your hair with the operated on arm?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
8. Have you had any trouble dressing yourself because of your operated on shoulder?				
④ No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	① Impossible to do
9. Could you hang your clothes up in a wardrobe – using the operated on arm?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
10. Have you been able to wash and dry yourself under both arms?				
④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	① No, impossible
11. How much has pain from your operated on shoulder interfered with your usual work hobbies/recreational activities (including housework)?				
④ Not at all	③ A little bit	② Moderately	① Greatly	① Totally
12. Have you been troubled by pain from your operated on shoulder in bed at night?				
④ No nights	③ Only 1 or 2 nights	② Some nights	① Most nights	① Every night
Overall, how satisfied are you with the outcome of your shoulder surgery?				
④ Very satisfied	③ Somewhat satisfied	② Neutral	① Somewhat dissatisfied	① Dissatisfied

Manchester-Oxford Foot Questionnaire (MOxFQ)

Circle as appropriate **Right / Left**

Full Name _____

Please tick (✓) one for each statement

1. During the past 4 weeks this has applied to me:

I have pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. During the past 4 weeks this has applied to me:

I avoid walking long distances because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. During the past 4 weeks this has applied to me:

I change the way I walk due to pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. During the past 4 weeks this has applied to me:

I walk slowly because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. During the past 4 weeks this has applied to me:

I have to stop and rest my foot/ankle because of pain

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. During the past 4 weeks this has applied to me:

I avoid some hard or rough surfaces because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. During the past 4 weeks this has applied to me:

I avoid standing for a long time because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. During the past 4 weeks this has applied to me:

I catch the bus or use the car instead of walking, because of pain in my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. During the past 4 weeks this has applied to me:

I feel self-conscious about my foot/ankle

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. During the past 4 weeks this has applied to me:

I feel self-conscious about the shoes I have to wear

None of the Time	Rarely	Some of the time	Most of the time	All of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. During the past 4 weeks this has applied to me:

The pain in my foot/ankle is more painful in the evening

None of the Time Rarely Some of the time Most of the time All of the time

12. During the past 4 weeks this has applied to me:

I get shooting pains in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

13. During the past 4 weeks this has applied to me:

The pain in my foot/ankle prevents me from carrying out my work/everyday activities

None of the Time Rarely Some of the time Most of the time All of the time

14. During the past 4 weeks this has applied to me:

I am unable to do all my social or recreational activities because of pain in my foot/ankle

None of the Time Rarely Some of the time Most of the time All of the time

15. During the past 4 weeks.....

How would you describe the pain you usually have in your foot/ankle?

None Very mild Mild Moderate Severe

16. During the past 4 weeks....

Have you been troubled by pain from your foot/ankle in bed at night?

Only 1 or 2
No nights nights Some nights Most nights Every night

Finally, please check that you have answered every question.
Thank you very much.

