THE NEW ZEALAND JOINT REGISTRY

2025

26 | Twenty-Six Year Report
January 1999 to December 2024

NEW ZEALAND JOINT REGISTRY

NZOA
New Zealand Orthopaedic Association

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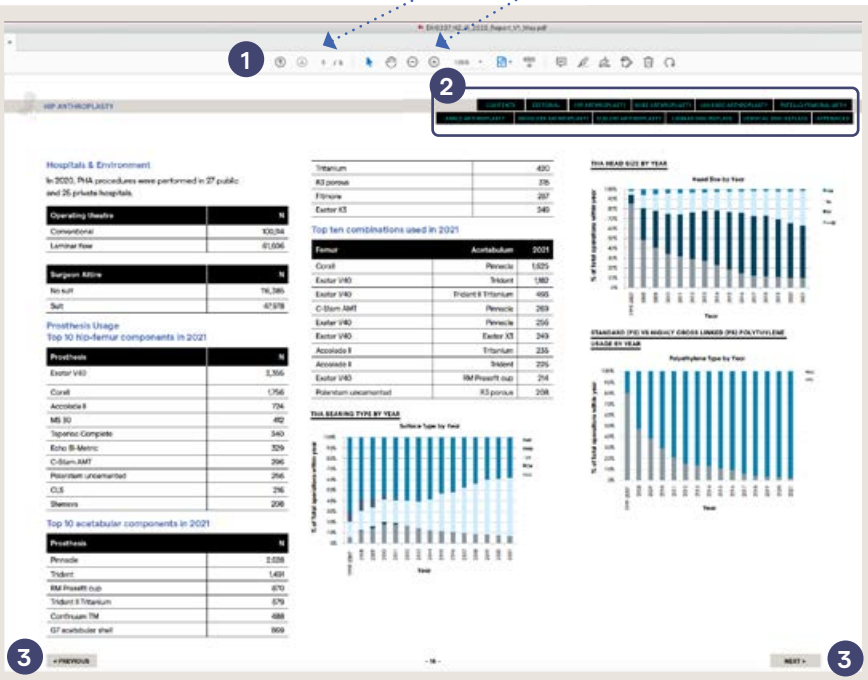

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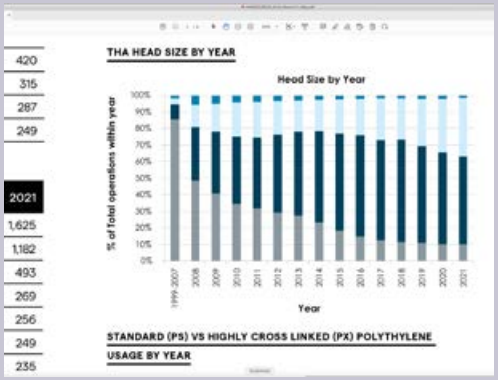

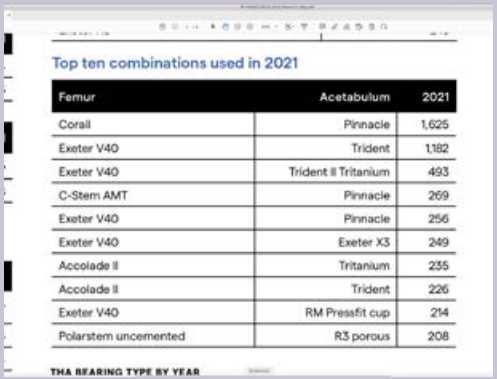

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CONTENTS

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EDITORIAL

06

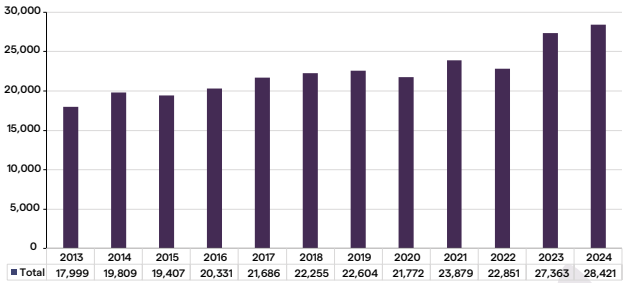
The Registry Management Committee is pleased to present the twenty-six-year report of the New Zealand Orthopaedic Association National Joint Registry.

As with previous reports, individual arthroplasty sections are self-contained, with explanatory notes for all chapters at the beginning of the report.

The number of registered arthroplasties now exceeds 450,000 with 28,732 (27,238 in 2023) new registrations in the 2024 calendar year. This increase continues the trend of recent years with increasing demand for and use of joint replacement surgery.

As can be seen in the graph below, 2024 represents a 60% increase in numbers from 2013.

Theatre Forms Received by Year



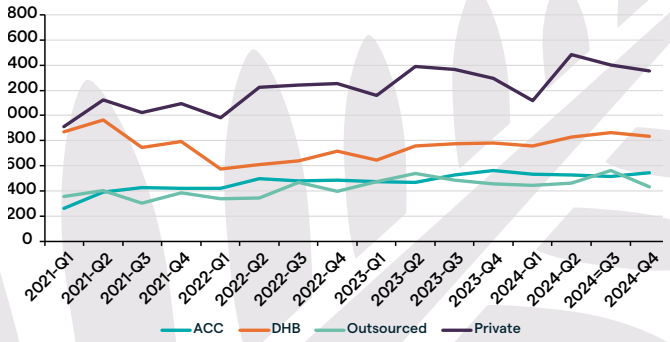
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total	17,999	19,809	19,407	20,331	21,686	22,255	22,604	21,772	23,879	22,851	27,363	28,421

This increase is explained in part with expected increases in population numbers and demographics as noted amongst hip and knee registrations.

More major increases are noted particularly within shoulder registrations where there has been increasing indications, and rapid uptake of reverse shoulder replacements, particularly in younger higher demand patients. Reverse now comprise 77% of all TSR registrations. Similarly, the indications for ankle arthroplasty have expanded with the availability of contemporary prostheses and this year's registrations represent over ten percent of the total registered cohort. Ongoing registry analysis will be important in monitoring the longer-term outcomes of these increases.

The public hospitals waiting list initiatives are going to continue the increasing numbers as surgery numbers move closer to community demand. At the time of writing, the numbers for 2025 are likely to significantly exceed 30,000.

Primary Hip Arthroplasty Procedures by Funding Source 2021 to 2024



Since 2020 the registry has been recording the funding source of surgery to better inform planners and funders of the community demand versus the publicly available resource. The increasing numbers of privately funded surgery helps inform the debate re the quantum of public health funding for arthroplasty.

We continue to track BMI data with the mean BMI of 31.6 and 29.3kg/m2 for knees and hips respectively; the number of morbidly obese (BMI>40) now exceeds 5% of all procedures.

Readers of the hip chapter will note the increasing trend towards uncemented implants. Ceramic on polyethylene is now the predominant bearing surface which is supported by the excellent published data on its longevity and representing a good cost versus utility balance compared to ceramic on ceramic.

Comment is made regarding the small but steady rise in the one-year hip revision rate. The increased numbers of early revisions due to infection may represent better quality data capture rather than a true increasing infection rate, however the total early revision rate is still climbing! Time will tell whether the fracture rate is correlated to the increasing use of uncemented stems, and if the increasing use of the anterior approach to the hip influences any or all the three main reasons for early failure: infection, dislocation, and fracture.

In the knee chapter it is noted that Attune, Triathlon and Persona continue to be the most commonly used implants and that revision numbers are evenly divided between major and minor revisions.

Mobile bearing data has not been presented in this year's report as it is undergoing forensic analysis. The reported low numbers of mobile bearing knees in previous reports were incorrect. Until this data has been cleaned and validated, it will not be represented.

It is encouraging to see Oxford scores averaging forty or more in all the commonly used knees and that these scores continue to improve at five years.

We are keen to gather better data on the reason for revision and changed the diagnostic category from "pain" – a symptom not a diagnosis, to "unexplained pain". It is noted that this is still the commonest listed reason for revision of unicompartmental knee replacements.

At the time of writing, the registry is still going through its platform upgrade with the associated challenges to all the staff. This has been a factor in the much later than expected publication of this report. It is hoped that we will see some of the promised efficiencies for the 2025 report. I thank all the staff for their perseverance through this process.

HIP ARTHROPLASTY

There are now 202,460 recorded primary hip arthroplasties (PHA). PHA include Total Hip Arthroplasty (THA), Resurfacing Hip Arthroplasty (RHA), and, since October 2020, Hip Hemiarthroplasty (HHA). The overall revision rate is 0.64/100 ocys (95% CI: 0.63-0.65).

There are in total 194,537 recorded THA, with 11,078 procedures performed in the 2024 year, a 5% increase over the 2023 year.

RHA comprises a consistent 1.3 % of PHA per annum, performed at about 150 procedures a year. In total, there are in total 2,639 RHA recorded.

In 2024, 1,491 HHA were performed, an increase of 9% over the 2023 year.

Excluding the years affected by the COVID-19 pandemic (2020-2022) when there was a significant drop in output, the average annual increase in total hip replacement volumes over the past 15 years has been 4%. It is reasonable to assume annual output will continue to progress at this level.

Demographics

The age, gender, BMI, ASA grade and ethnicity of patients receiving primary hip arthroplasties is relatively consistent. There is a general trend to more comorbid patients with the percentage of ASA1 patients forming only 10% of the total recipients. ASA4 graded patients now make up 30% of the total. However, this may be influenced by the inclusion of hemiarthroplasties in the overall statistics since 2020.

267 surgeons performed the 11,078 procedures in 55 hospitals, 27 public and 28 private. This is an average of 41 procedures per surgeon. The number of facilities has increased over the last 2 years (2022 n=52, 2023 n=54), with the surgeon number relatively static (2022 n=280, 2023 n=261), with the average number of PHA per surgeon increasing from 38 to 41 over this period.

Fixation

Cemented acetabular fixation continues to fall below 5% (332/11,078), this year accounting for only 3% of THA despite excellent clinical results. Between the hybrid and fully uncemented fixation, there is a slight increasing trend for fully uncemented use at the expense of cemented femoral components.
Fully uncemented components account for now greater than 50% of implants at 51.7% (5,728/11,078) and hybrid fixation at 44.8% (4,965/11,078).

Bearings/Articulations

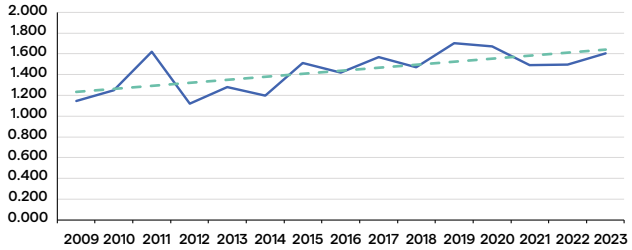
The trend towards a dominance of ceramic on highly cross-linked polyethylene continues. This is at the expense of metal on polyethylene implants. Since 2022, there has also been a small resurgence in metal-on-metal articulations. Whilst relatively small numbers are recorded (n=117), this is interesting to note. There are also 61 recorded cases of ceramic on metal articulations in 2024. Ceramic-ceramic cases now account for less than 5% of bearings.

Head size diameter continues to show a trend towards 36 mm articulations. The traditional 28 mm or smaller remain constant at 10%. Greater than 36 mm bearings are less than 1%. Therefore, 90% of hip replacements in New Zealand are performed with either 32- or 36-mm heads, with the increasing trend of 36 mm heads being at the expense of 32 mm heads proportionally.

Revision Surgery

The percentage of primary hips revised within one year from surgery is 1.6%. Whilst this represents a small increase over the last two years at 1.5%, when reviewed over the last 15 years, there is a worrying trend of slow but steady increase. The rate of revision within one year from surgery in 2010 was 1.25%. The reason for the increased revision rate is not clear. However, this implies that 40 more hips were revised within the first 12 months based on current indications for revision than would have been performed 15 years ago. This trend deserves to be investigated further.

% Revised within 1 year of Primary THA



In general terms, revision within the first year is one third due to deep infection, one third due to dislocation and one third due to other causes - either component loosening (acetabulum or femur) or periprosthetic fracture. Whilst not all these elements are within a surgeon's control, it does behove the surgeon to ensure they are using the best infection prevention strategies, well proven implants, and meticulous surgical technique to try and mitigate these risks.

Surgeons should be aware of the influence of age at primary surgery, gender and ethnicity on outcomes as indicated in the relative graphs.

KNEE ARTHROPLASTY

Since 1999, 163,781 conventional total knee arthroplasties have been registered, totalling 1,489,002 ocys. The overall revision rate continues to trend lower, now 0.41 per 100 ocys (95% CI 0.40–0.42). TKA volume again increased, with 11,027 TKAs implanted in 2024 – up from 9,777 in 2023 and 7,794 in 2022. The steady rise reflects continued recovery from post-COVID service constraints, with operating capacity essentially back to pre-pandemic norms. In 2024, 241 surgeons performed 10,647 TKAs across 54 hospitals (27 public and 27 private), averaging 44 cases per surgeon annually.

There are 49 different knee prostheses with ≥50 registrations. The Triathlon remains the most commonly used TKA prosthesis, followed by the Attune and Persona. The use of fully uncemented TKAs continues to grow, now representing 18% of all primary knee arthroplasties. Uncemented designs maintain a significantly higher revision rate than either fully cemented or hybrid constructs (tibial cemented + femoral uncemented), and this pattern is consistent across all major brands.

The comparison of cruciate-retaining (CR) and posterior-stabilised (PS) prostheses continues to show higher revision rates for PS designs. Kaplan–Meier survival curves confirm this trend across nearly all brands. The use of PS implants has stabilised around 18–20% of TKAs.

Revision-rate tables by BMI grouping show a consistent gradient: outcomes worsen with increasing BMI, and morbid obesity (BMI > 40) remains a significant independent risk factor for revision. Use of robotic-assisted knee arthroplasty continues to expand, with 6,366 procedures now recorded across both public and private sectors. Patient-reported outcomes remain strong, with an average Oxford Knee Score of 38 at six months and 85% of patients achieving "good" or "excellent" results.

There are 1,111 registered patellofemoral prostheses, with 135 added in 2024. Of these, 794 used the Zimmer Gender Solutions components. There have been 133 revisions, giving a revision rate of 1.87 per 100 ocys—around four times higher than for TKA.

There were 1,263 unicompartmental knee arthroplasties registered in 2024, of which 97% were medial. The Oxford 3 Uncemented remains dominant, accounting for 69% of UKAs. The overall UKA revision rate is 1.02 per 100 ocys (95% CI 0.97–1.08). As previously observed, females have higher UKA revision rates (1.14 per 100 ocys, 95% CI 1.07–1.22) than males (0.93 per 100 ocys, 95% CI 0.86–1.00).

ANKLE ARTHROPLASTY

In 2024 there was a further marked increase in ankle replacement utilisation. There were 294 primary ankles registered. In 2023 registrations had increased by ~25% to 207. The 294 registered in 2024 is a greater than 40% further increase.

There are now 2685 primary ankle replacements registered with a total of 19,274.7 observed component years (ocys). The overall revision rate is 1.45/100 ocys. The cumulative incidence of revision graph with 95% confidence intervals extends out to around 18 years when 78.8% of implants have not been reported to be revised.

A sudden shift in implant usage was observed in 2023 due to a withdrawal from the market of the Salto, Salto Talaris and Infinity implants. In 2022 those three implants accounted for over three quarters of new registrations. In 2024 they were only 1% of registrations (the last 3 Salto Talaris implants used). The 'Infinity with Adaptis' that was introduced in late 2022 to replace the other three implants accounted for approximately 60% of new registrations in 2024. The other implants in use in 2024 were the Vantage mobile bearing (15%), Zimmer TM (13%), Vantage fixed bearing (7%) and Inbone II (4%). What effects this sudden change in implant usage has on revision rates and follow-up MOXFQ scores will be interesting to observe over the next few years.

SHOULDER ARTHROPLASTY

Shoulder arthroplasty continues to see an ongoing steady increase in utilisation with an increase of 303 cases over the previous year to 1779 cases. This is a 17% increase on the previous year and a 60% increase over the past two years.

The increase continues to be driven by the increased utilisation of reverse shoulder arthroplasty rather than an increase across the various categories of arthroplasty. This highlights the ongoing trend of the past decade where total shoulder arthroplasty has remained stable in terms of numbers, hemiarthroplasty has decreased but there has been an exponential increase in reverse shoulder arthroplasty which now represents 77% of all shoulder arthroplasties performed. This is consistent with other joint registries which have seen similar increases in the utilisation of reverse shoulder replacement over the past decade.

The reverse shoulder replacement has the lowest revision rate of the categories of shoulder arthroplasty. With the increasing utilisation of reverse shoulder arthroplasty, there would be an expectation that the revision rate will continue to improve in the short term. With the changing indications for reverse shoulder arthroplasty away from low demand, elderly patients to a younger, more active cohort, it is likely that there will come a point in the years ahead where the revision rate for reverse shoulder arthroplasty will reach a low point and start to increase.
The revision rate for patients aged 55-64 undergoing reverse shoulder arthroplasty is 1.18 per 100 component years while for those aged 65-74 it is 0.68, with a further decrease to 0.43 in those age over 75 years.

The cumulative revision rate of all shoulder arthroplasty is 7.5% at 10 years and 14% at 20 years. After an initial increased revision rate for reverse shoulder arthroplasty over total shoulder replacement in the first year, reverse shoulder arthroplasty outperforms total shoulder arthroplasty out to the twenty-year mark. Results over 15 years are expected to change in the reverse arthroplasty category as increased numbers reach the 15-year timepoint.
At present, there are only 115 reverse shoulder arthroplasty cases over 15 years in the registry.

The following implants have been identified with revision rates outside the confidence intervals in the various categories of shoulder arthroplasty and with more than 50 cases registered. The Global Unite and SMR hemiarthroplasty are stable with no change in their overall revision rate over the last few years. In reverse shoulder arthroplasty, the Equinoxe Reverse has been identified in previous years to be monitored but has an increasing revision rate this year. The Global Unite Reverse and Perform Reverse have an increasing revision rate this year and need to be observed. The SMR total shoulder arthroplasty revision rate has remained unchanged over the last few years.

Glenoid loosening is the primary indication for revision with one-third occurring in the first two years. Factors that affect revision rate in shoulder arthroplasty include gender, ethnicity, and age.

ELBOW ARTHROPLASTY

The annual number of elbow arthroplasties has not significantly increased. Trauma is the commonest indication for elbow replacement. The Lattitude is the most common total elbow prosthesis used. Conrad—Morrey remains the best performing elbow prosthesis with the lowest revision. For ease of understanding, radial head replacement will be reported separately in the future.

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. Similarly, hip and knee questionnaire scores six months post first revision arthroplasty, predict the second revision within two years.

John McKie – Supervisor

Jinny Willis – Manager

Chris Frampton – Statistician

STATISTICAL TERMS/NOTES

Throughout the report, 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.

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 arthroplasty their data is always valid for all analyses for that eight- year period. Hence the rider "deceased patients censored at time of death".

ASA CLASS

This was introduced with the updated forms at the beginning of 2005. The data are provided in each of the joint chapters. The categories are defined below.

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

Ethnicity

Ethnicity data of patients and revision rates by ethnicity were recorded in the annual NZJR report for the first time in the 23-year report. Ethnicity data is recorded for every entry in registry. At the point of data entry, the ethnicity associated with the NHI is retrieved from the Ministry of Health database. For a proportion of individuals, the ethnicity is entered as Not Recorded, meaning the patient has not been asked to provide the information, or has declined to provide the data. For the purpose of reporting revision rates by ethnicity, the rate is not reported for patients whose ethnicity is not recorded.

Trainee Surgeons

In all the analyses reported, consultants took responsibility for their registrar surgeon procedures.

Bilateral Joint Replacements

The following joint arthroplasties were undertaken on the left and right side and carried out under the same anaesthetic:

Bilateral Total Hips

3,631 Patients

(7,262 hips)

Bilateral Total Knees

6,087 Patients

(12,174 knees)

Bilateral UKR

1,425 Patients

(2,850 knees)

Bilateral Ankles

2 Patients

(4 ankles)

Bilateral Shoulders

5 Patients

(10 shoulders)

DEVELOPMENT & IMPLEMENTATION OF THE NEW ZEALAND JOINT REGISTER

11

The year 1997 marked 30 years since the first hip arthroplasty was performed in New Zealand. To mark this milestone and to provide an ongoing source of quality data to monitor performance, guide practice and facilitate research, the NZOA unanimously endorsed the proposal of 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 revision shoulder.

Surgeon Attire is a new heading. Option 1 is Space Suits/Helmet Fan. Option 2 is 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

When the Registry was set up originally in 1997, a Microsoft Access platform was used as the most suitable and appropriate platform. The database served the Registry's requirements for more than 25 years, but a platform upgrade was necessary. A tender process was undertaken in 2024, and Magnetism Solutions Ltd was awarded the contract. The new Registry solution is based on Microsoft Dynamics 365. The new database went live on 25 August 2025, with the Registry team entering data into the new platform from that day onwards. As with all ventures of this type there are teething issues and challenges to negotiate, and these are being worked through.

Patient Generated Outcomes

The NZ Registry was one of the first to collect patient recorded outcome measures with the use of the Oxford hip and knee scores. These questionnaires are sent out to registered arthroplasties six months and then every five years following surgery. Because of the large numbers involved, statistical advice was that a random sample of 20% of cases would provide valid results, and this continues to be our practice.

This data provides powerful predictive data on the risk of subsequent revision over the ensuing two years following survey.

Funding

The registry is principally funded by surgeons paying a levy, with small contributions from ACC, and MOH. Fees are also charged for companies wanting anonymized implant data. We strongly advocate a fixed percentage levy on all implants, to fund post market surveillance in perpetuity. To date we have made no progress with governmental agencies, and if the governmental doesn't insist on a levy, the implant companies are unwilling to contribute.

Until this or another significant funding source is found, we will continue to function on a shoestring.

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 of their revision rate and Oxford scores. This data has been presented graphically over the past five years with individual funnel plots and snail trails.

From 2025 we will also be presenting ethnicity data to inform health equity of outcomes and cultural safety discussions.

Introduction of the Registry

The National Joint Registry was introduced in a planned staged fashion.

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 arthroplasties for fractured neck of femur, unicompartmental arthroplasties for knees, and total joint arthroplasties 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 arthroplasty 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 arthroplasty 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 2024 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 is essential for both our statistical analyses and our monthly questionnaire mail outs.

NZJR Staff

The current staff are data entry (3.25 FTE), Registry Manager (1.0 FTE), Registry Supervisor (0.2 FTE) and Statistician (0.04 FTE).

HIP ARTHROPLASTY

14

PRIMARY HIP ARTHROPLASTY

The **twenty-six–year** eport analyses data for the period January 1999 – December 2024.

New data forms introduced in October 2020 now have 3 categories of hip replacement. These are total hip arthroplasty (THA), resurfacing hip arthroplasty (RHA) and hemiarthroplasty (HHA). Hemiarthroplasty procedures have only been recorded in the registry since 2020.

Primary Hip Arthroplasty by Type - 1999 to 2024

Primary Hip Arthroplasty (PHA) Type	N
Total Hip Arthroplasty (THA)	194,537
Resurfacing Hip Arthroplasty (RHA)	2,639
Hip Hemiarthroplasty (HHA)	5,284
Total	**202,460**

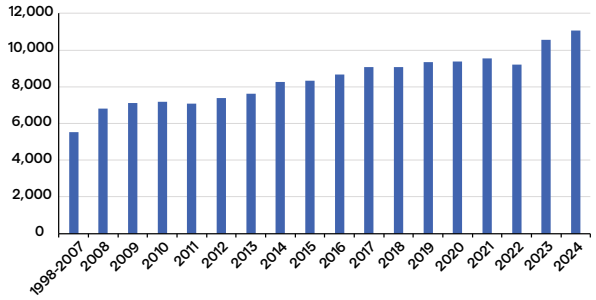
TABLE 1.1

Primary Hip Arthroplasty by Type and Year

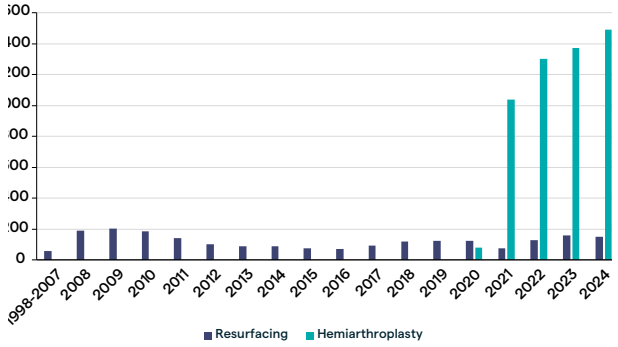
Year	THA	Resurfacing	Hemiarthroplasty
1998-2007	5,512	57	0
2008	6,813	191	0
2009	7,103	203	0
2010	7,183	185	0
2011	7,078	142	0
2012	7,391	102	0
2013	7,620	90	0
2014	8,259	89	0
2015	8,345	77	0
2016	8,675	70	0
2017	9,083	94	0
2018	9,068	118	0
2019	9,358	124	0
2020	9,366	122	79
2021	9,535	77	1,037
2022	9,207	130	1,303
2023	10,548	160	1,374
2024	11,078	149	1,491

TABLE 1.2

Number of Total Hip Arthroplasties by year



Number of Operations by Year



Age of Primary Hip Arthroplasty Patients by Gender

	Female			
	Mean	Minimum	Maximum	N (%)
Hemiarthroplasty	84.0	35.0	106.0	3,488
Resurfacing hip	49.7	25.0	83.0	278
Total hip	68.7	11.5	101.8	104,621

TABLE 1.3

	Male			
	Mean	Minimum	Maximum	N (%)
Hemiarthroplasty	82.9	34.0	102.0	1,796
Resurfacing hip	52.2	17.0	81.0	278
Total hip	66.0	11.9	100.0	89,761

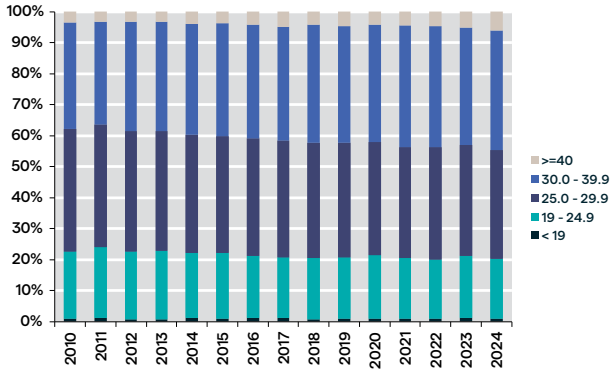
TABLE 1.4

Data form analysis includes new form and legacy data and is for **Total Hip Arthroplasty**.

Body Mass Index of Primary Hip Arthroplasty Patients

BMI data was added with the 2010 form update. For the period 2010 – 2024 there were 101,879 BMI registrations for primary hip replacements. The average was 29.27 kg/m2 with a range of 14 – 68 and a standard deviation of 5.82.

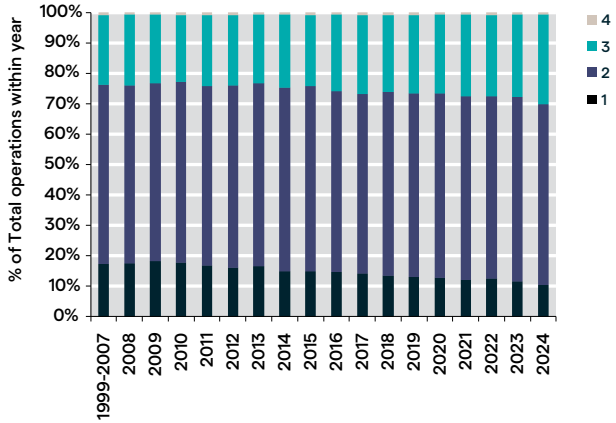
BMI by Year



ASA Class	N	%
1	23,163	14.5
2	95,329	59.8
3	39,625	24.9
4	1,266	0.8

TABLE 1.5

ASA by Year



Ethnicity of Total Hip Arthroplasty Patients

Ethnicity	Operations (n)	%
Asian	1,703	0.9
Euro/Other	168,973	89.6
Māori	15,774	8.4
Pacifica	2,154	1.1

TABLE 1.6

Prior Surgery in Total Hip Arthroplasty Patients

Previous Operation	N	%
None	200,371	97.5
Internal Fixation	3,666	1.8
Osteotomy	1,042	0.5
Arthrodesis	134	0.1
Hip Arthroscopy	191	0.1

TABLE 1.7

Indication for Total Hip Arthroplasty

Diagnosis	N	%
Osteoarthritis	172,583	88.8
Rheumatoid Arthritis	3,147	1.6
Other Inflammatory	1,327	0.7
Acute Fracture NOF	7,380	3.8
Old Fracture NOF	2,083	1.1
Avascular Necrosis	5,939	3.1
Developmental Dysplasia	3,806	2.0
Post-acute dislocation	365	0.2

TABLE 1.8

Surgeons

In 2024, 267 surgeons performed 11,078 primary hip replacements, an average of 41 procedures per surgeon. The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the 18-year period 2005 – 2024.

Surgeon grade	N
Consultant	181,547
Advanced trainee supervised	14,927
Advanced trainee unsupervised	4,461
Basic trainee	3,476

TABLE 1.9

Surgical Approach

Approach	Operations (N)
Posterior	136,243
Anterior*	8,672
Superior	313
Lateral	38,319
Trans-trochanteric (osteotomy)	231

* Data for 2021 - 2024 only.

TABLE 1.10

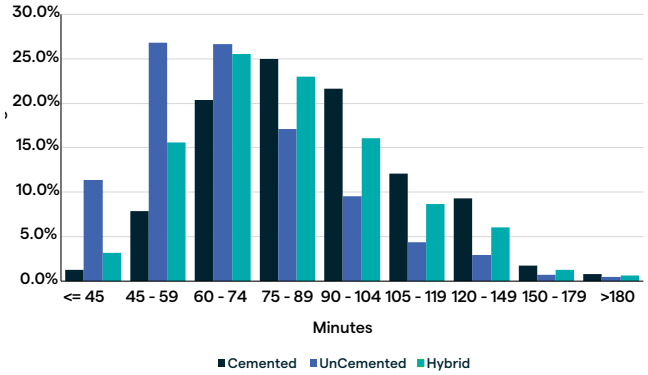
Adjuncts (2022-24)	N	%
Computer Navigation	356	1.2
Adjunct Robot	17	0.06

TABLE 1.11

Hospitals

In 2024, primary hip replacement was performed in 55 hospitals: 27 public and 28 private.

Operative Time (Skin-to-Skin Minutes) by Cementation Type



Prosthesis Usage

Top Hip Femur Components in 2024

Femur	All Years	2024
Exeter V40 Femoral Stem	66324	3184
Corail Cementless Femoral Stem	23230	1777
Accolade II Femoral Stem	6406	741
C-Stem AMT Femoral Component	5765	608
Optimys Femoral Stem	1564	543
MS 30	7344	482
Taperloc Complete Femoral Stem	2547	337
Echo Bi-Metric Femoral Component	2236	307
TwinSys Cemented Standard Stem	2364	271
Metafix Collared Femoral Stem	504	265

TABLE 1.12

Top 10 Acetabular components in 2024

Acetabulum	All Years	2024
Pinnacle Gription Acetabular Shell	34437	2874
Trident II Tritanium Acetabular Shell	7557	2590
RM Pressfit Acetabular Cup	17793	1190
G7 Osseo Ti Acetabular Shell	2592	804
G7 Acetabular Shell	3477	485
Trinity Acetabular Cluster Shell	766	397
R3 No Hole HA Coated Acetabulum	6805	336
Trident Acetabular Shell	16144	300
Continuum TM Acetabulum	10710	244
Delta-TT Acetabular Cup	2976	224

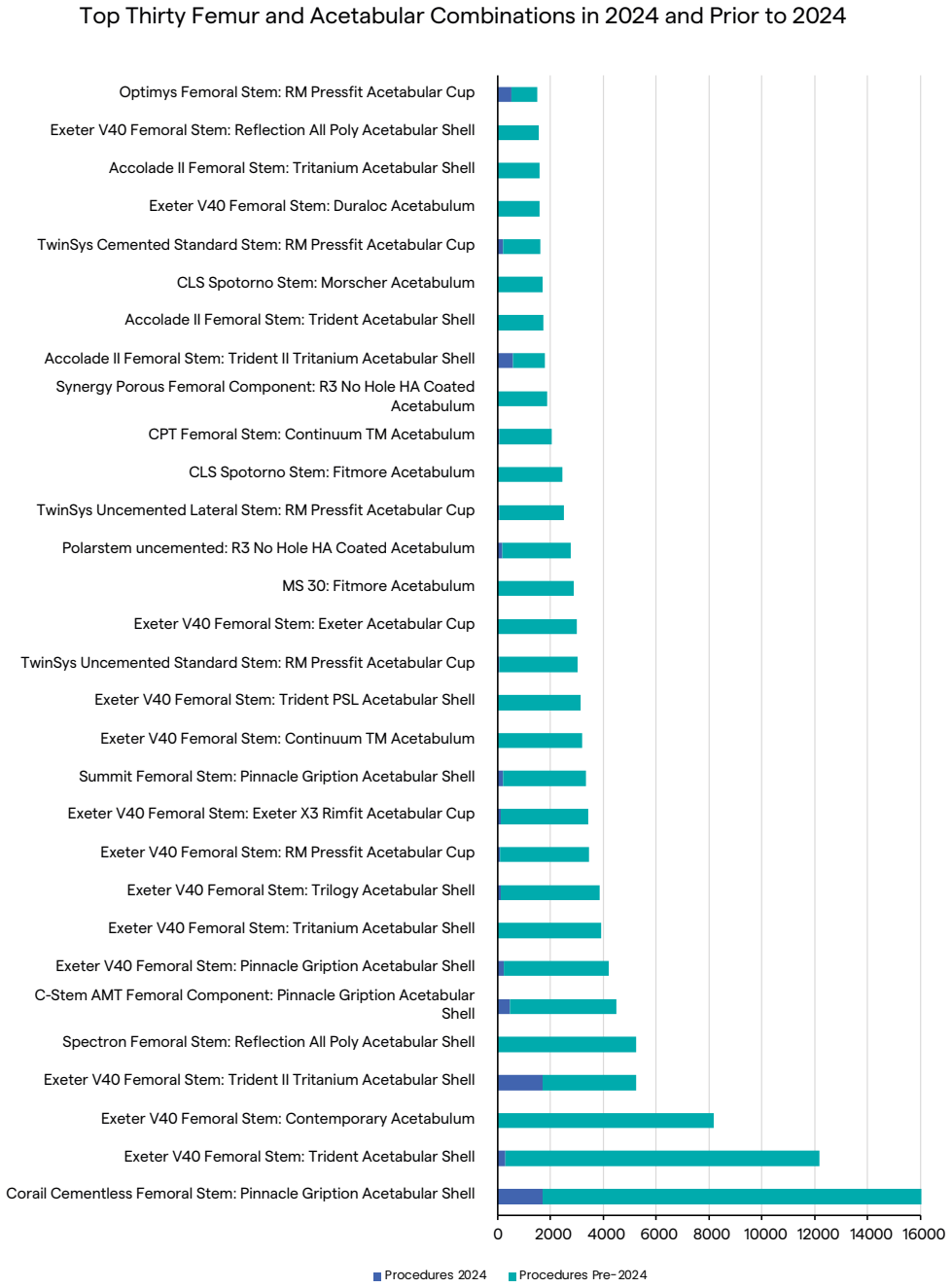
TABLE 1.13

Top ten combinations used in 2024

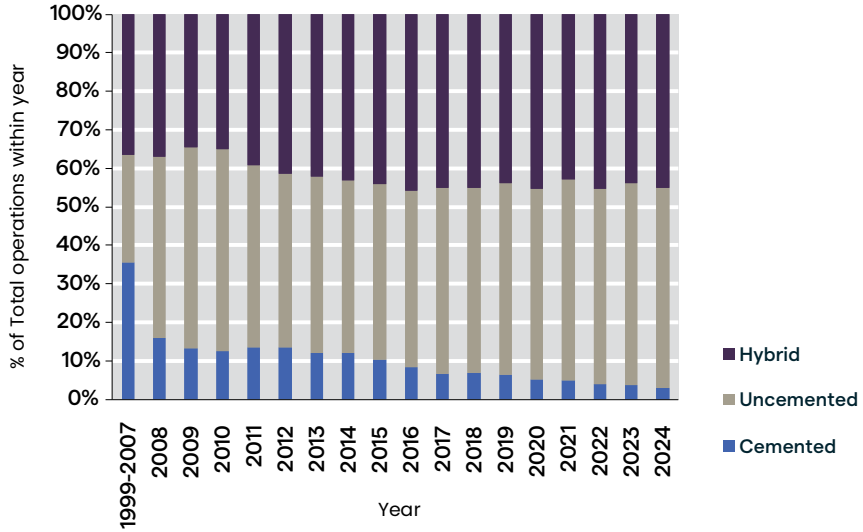
Femur	Acetabulum	All Years	2024
Corail Cementless Femoral Stem	Pinnacle Gription Acetabular Shell	20,093	1,719
Exeter V40 Femoral Stem	Trident II Tritanium Acetabular Shell	5,260	1,719
Accolade II Femoral Stem	Trident II Tritanium Acetabular Shell	1,804	592
Optimys Femoral Stem	RM Pressfit Acetabular Cup	1,515	517
C-Stem AMT Femoral Component	Pinnacle Gription Acetabular Shell	4,502	481
Exeter V40 Femoral Stem	Trident Acetabular Shell	12,176	290
Metafix Collared Femoral Stem	Trinity Acetabular Cluster Shell	477	258
Exeter V40 Femoral Stem	Pinnacle Gription Acetabular Shell	4,213	238
MS 30	G7 Acetabular Shell	708	224
TwinSys Cemented Standard Stem	RM Pressfit Acetabular Cup	1,634	208

TABLE 1.14

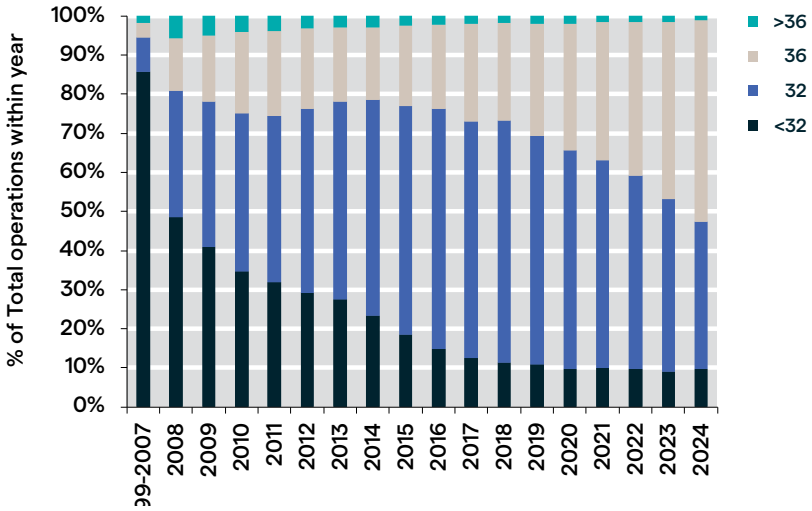
Top Thirty Femur and Acetabular Combinations in 2024 and Prior to 2024



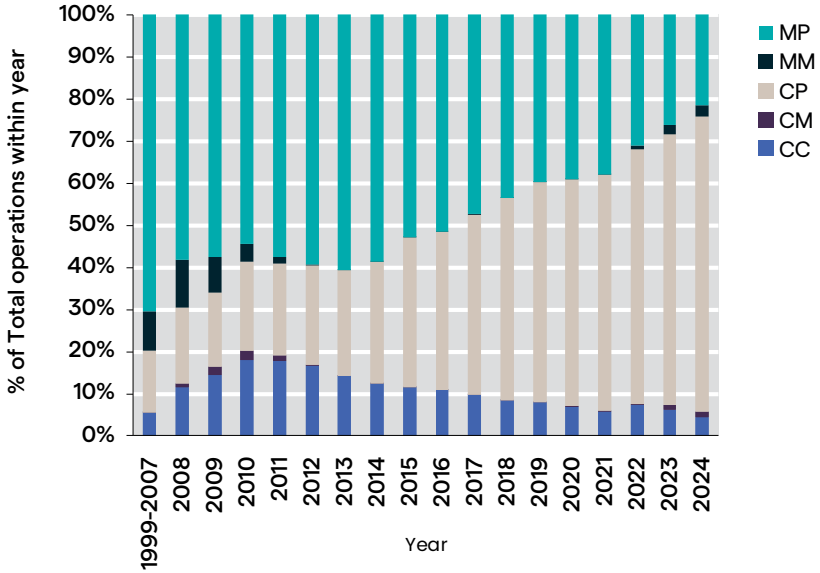
Cementation rates by Year



Head Size by Year



Surface Type by Year



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.

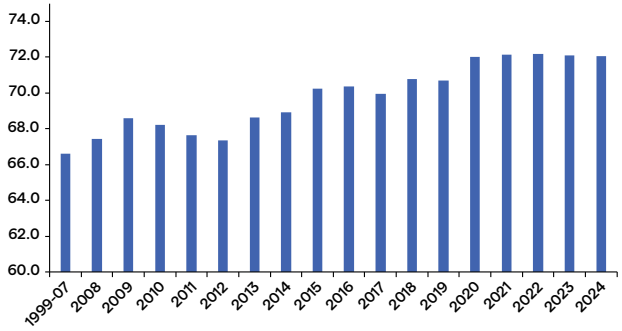
Procedures where all components are removed (e.g. Girdlestone or removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

Data analysis

For the **twenty-six-year** period January 1999 – December 2024, there were 32, 275 hip revision procedures registered. This is an additional 1,484 revisions added in 2024.

The average age for a hip revision was 70 years, with a range of 17 – 102 years.

Mean Age of Revision



Revision of Registered Hip Arthroplasties

This section analyses data for first revisions of registered Total Hip Arthroplasties for the twenty-five-year period (n=12,349).

Total hip arthroplasty

Time to Revision from Primary Procedure	Days	(Equiv. Years)
Average	2,487	6.8
Maximum	9,388	25.7
Minimum	0	0

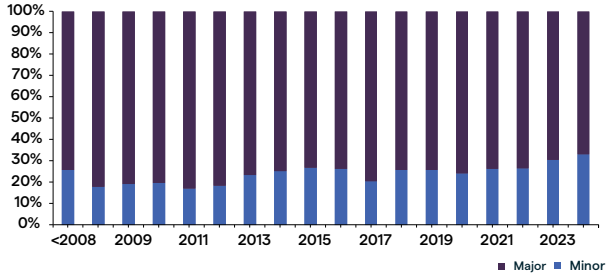
TABLE 1.15

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

TABLE 1.16

Major/Minor Revision by Year



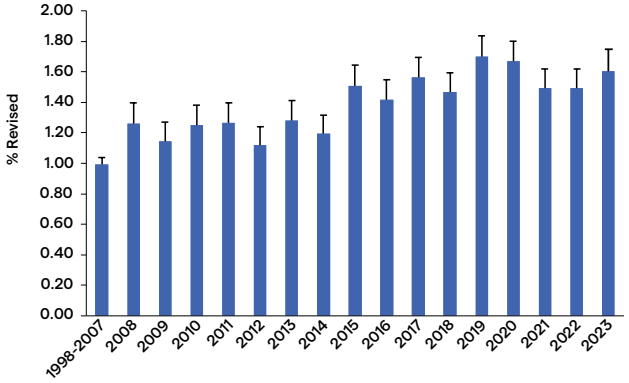
Re-operation only: no components added, exchanged or removed.

Reason for revision (1999-2024)	N (%)
Dislocation/instability	2193 (21.1)
Loosening acetabular component	2070 (19.4)
Loosening femoral component	1730 (16.7)
Unexplained pain	1628 (15.6)
Deep infection	1260 (12.1)
Fracture femur	1496 (14.4)

TABLE 1.17

All Cause Revision

% Revised within first year

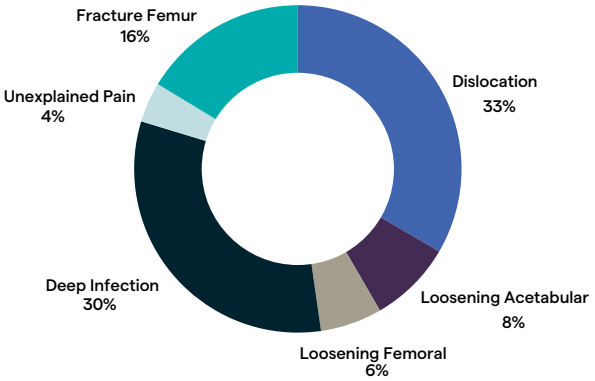


Reason for Revision of THA by Years since Operation

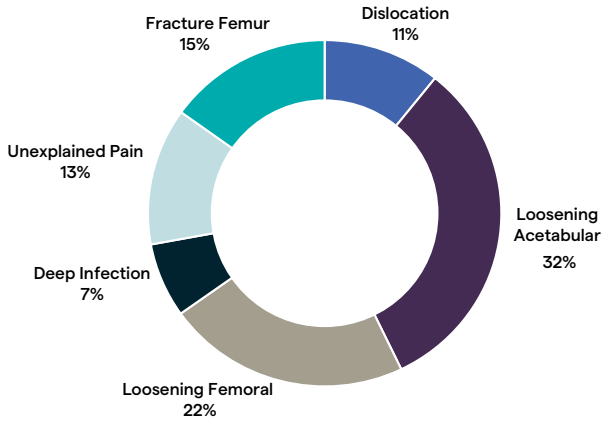
Years since operation	Dislocation		Loosening Acetabulum		Loosening Femur		Deep Infection		Unexplained Pain		Fracture Femur	
	N	%	N	%	N	%	N	%	N	%	N	%
0	849	38.7	209	10.1	155	9.0	812	49.9	101	8.0	415	27.7
1	232	10.6	94	4.5	109	6.3	136	8.4	122	9.7	73	4.9
2	176	8.0	92	4.4	103	6.0	116	7.1	107	8.5	69	4.6
3	134	6.1	97	4.7	95	5.5	72	4.4	84	6.7	68	4.5
4	101	4.6	82	4.0	83	4.8	53	3.3	81	6.4	79	5.3
5	95	4.3	96	4.6	86	5.0	54	3.3	86	6.8	70	4.7
6	87	4.0	105	5.1	110	6.4	40	2.5	78	6.2	64	4.3
7	65	3.0	96	4.6	98	5.7	46	2.8	61	4.8	52	3.5
8	75	3.4	114	5.5	99	5.7	48	2.9	73	5.8	67	4.5
9	50	2.3	137	6.6	99	5.7	37	2.3	64	5.1	79	5.3
10	46	2.1	103	5.0	106	6.1	31	1.9	66	5.2	63	4.2
>10	283	12.9	845	40.8	587	33.9	183	11.2	337	26.7	397	26.5
Total	**2193**	**100**	**2070**	**100**	**1730**	**100**	**1628**	**100**	**1260**	**100**	**1496**	**100**

TABLE 1.18

Indication for Revision (%) within First Year



Indication for Revision (%) beyond 10 Years

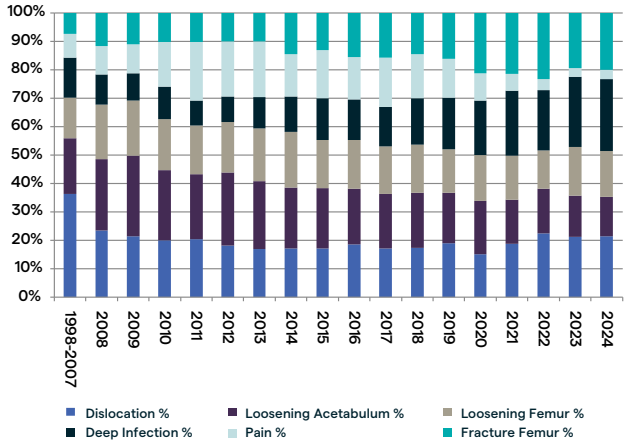


Reason for Revision of THA by Years since Operation

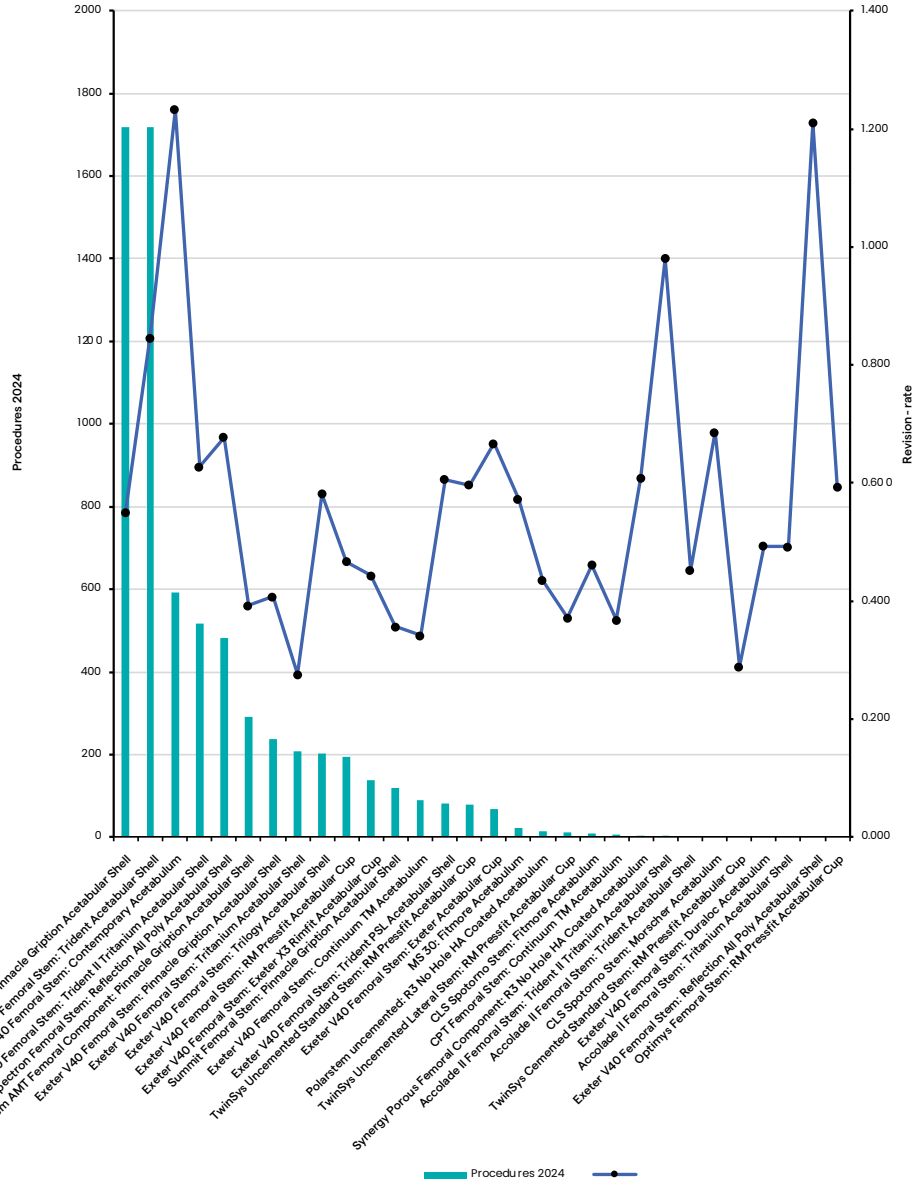
Years	Dislocation		Loosening Acetabulum		Loosening Femur		Deep Infection		Unexplained Pain		Fracture Femur		Total
	N	%	N	%	N	%	N	%	N	%	N	%	
1998-2007	468	38.1	250	20.4	186	15.1	179	14.6	109	8.9	94	7.7	**1228**
2008	82	24.6	88	26.4	67	20.1	37	11.1	35	10.5	41	12.3	**333**
2009	84	22.5	111	29.7	76	20.3	38	10.2	40	10.7	43	11.5	**374**
2010	88	21.4	108	26.3	79	19.2	50	12.2	69	16.8	45	10.9	**411**
2011	106	20.5	118	22.9	89	17.2	45	8.7	107	20.7	53	10.3	**516**
2012	92	17.2	130	24.3	89	16.6	46	8.6	97	18.1	51	9.5	**535**
2013	95	15.8	134	22.3	104	17.3	61	10.1	110	18.3	56	9.3	**602**
2014	86	15.2	107	19.0	97	17.2	62	11.0	75	13.3	72	12.8	**564**
2015	103	16.5	128	20.5	102	16.3	88	14.1	102	16.3	79	12.7	**624**
2016	105	17.0	110	17.9	96	15.6	80	13.0	84	13.6	87	14.1	**616**
2017	104	16.7	116	18.6	101	16.2	84	13.5	106	17.0	95	15.2	**624**
2018	102	16.3	113	18.0	99	15.8	96	15.3	91	14.5	85	13.6	**627**
2019	131	18.6	124	17.6	105	14.9	127	18.0	94	13.3	112	15.9	**705**
2020	84	15.0	103	18.4	89	15.9	106	18.9	53	9.5	117	20.9	**560**
2021	100	16.9	82	13.9	82	13.9	122	20.6	31	5.2	114	19.3	**592**
2022	111	20.5	78	14.4	67	12.4	105	19.4	19	3.5	115	21.3	**541**
2023	122	19.5	83	13.3	98	15.7	141	22.5	18	2.9	111	17.7	**626**
2024	126	19.4	81	12.5	95	14.7	148	22.8	19	2.9	118	18.2	**648**

TABLE 1.19

Major Reasons for Revision by Year of Implantation



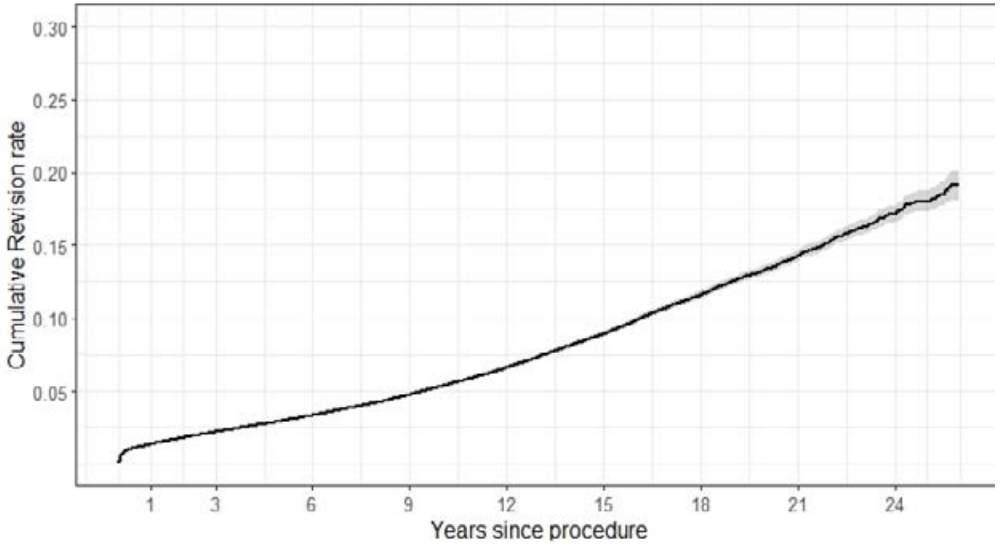
Femur and Acetabulum Combinations by Numbers used in 2024 and Revision Rate



Cumulative Revision Analyses

The following cumulative incidence analyses are for the **25 years 1999 – 2024** with deceased patients censored at time of death.

Proportion of THA Cases Free of Revision from All Causes



Years	% Revision-free	At Risk (N)	Revised (N)
1	98.65	178,626	2,574
3	97.81	152,938	4,001
6	96.66	115,856	5,580
9	95.25	81,891	7,016
12	93.39	54,096	8,335
15	91.08	32,892	6,407
18	88.41	17,727	10,150
21	85.74	7,774	10,532
24	82.50	2,289	10,697

TABLE 1.20

Revision Rates

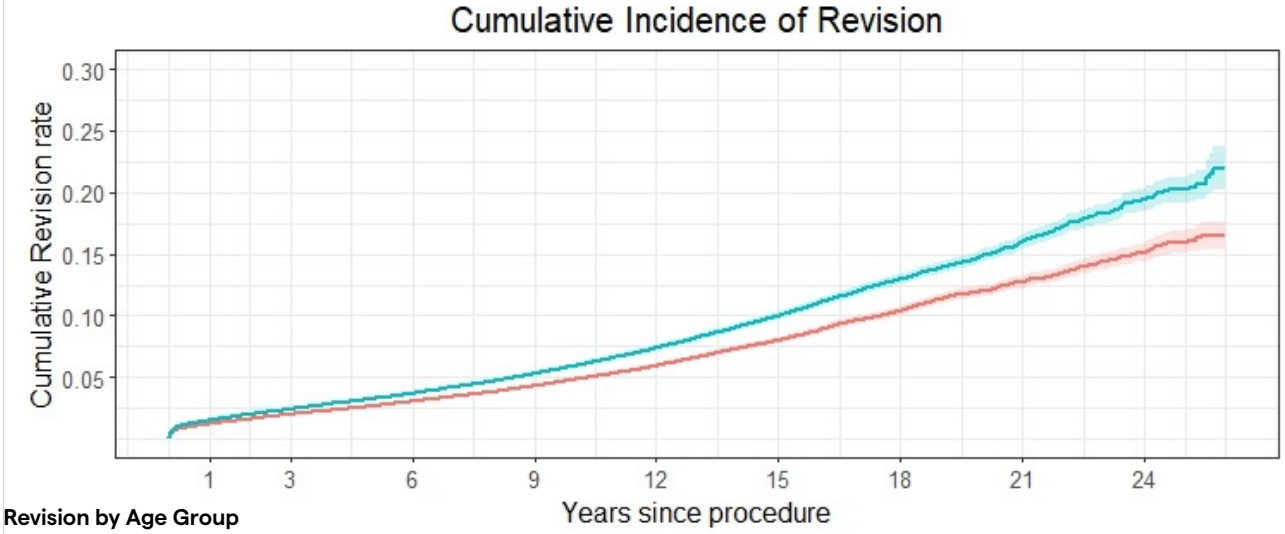
	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
All patients	194,379	167,3581.0	10,726	0.6409 (0.63-0.65)

TABLE 1.21

Revision by Gender

Sex	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
F	104,619	896,248.7	5,135	0.57 (0.56-0.59)
M	89,760	777,332.3	5,591	0.72 (0.70-0.74)

TABLE 1.22



Revision by Age Group

At Risk

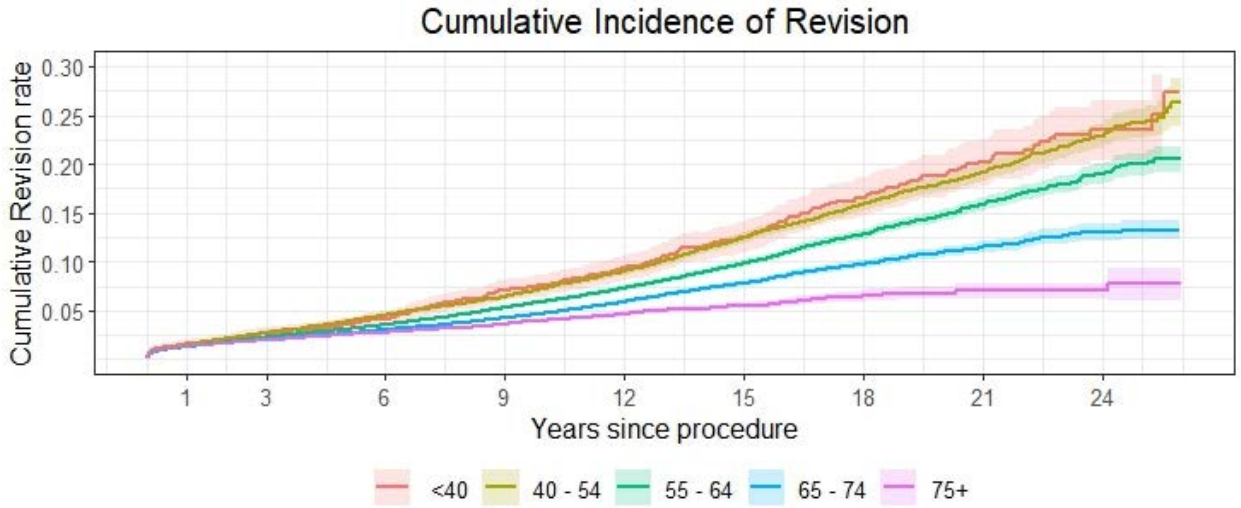
F	96142	82198	62289	43833	28801	17378	9227	3986	1243
M	82484	70740	53567	38058	25295	15514	8500	3788	1046

Revised

F	1254	1964	2724	3411	4022	4531	4875	5051	5121
M	1320	2037	2856	3605	4313	4876	5275	5481	5576

Age Groups	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
<40	2,978	32,444.2	313	0.96 (0.86-1.08)
40-54	23,750	249,628.3	2,275	0.91 (0.87-0.95)
55-64	48,933	468,696.7	3,368	0.72 (0.69-0.74)
65-74	66,049	571,666.1	3,157	0.55 (0.53-0.57)
>=75	52,669	351,145.7	1,613	0.46 (0.44-0.48)

TABLE 1.23



At Risk

<40	2772	2454	2041	1605	1239	931	643	357	136
40 - 54	22273	19825	16323	12838	9535	6544	4053	2103	702
55 - 64	45341	39483	31288	23605	16971	11167	6518	2956	852
65 - 74	60883	52401	40151	28761	18861	11037	5390	2007	465
75+	47357	38775	26053	15082	7490	3213	1123	351	134

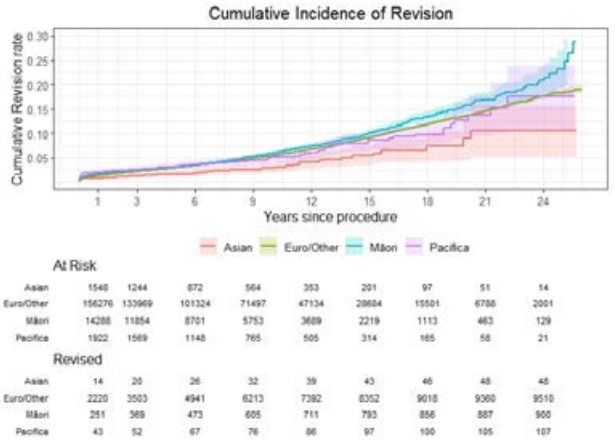
Revised

<40	48	76	110	166	201	240	278	300	311
40 - 54	340	616	951	1245	1560	1864	2075	2196	2260
55 - 64	640	1054	1518	2014	2449	2831	3124	3288	3358
65 - 74	843	1269	1758	2174	2585	2887	3065	3136	3156
75+	703	986	1243	1417	1540	1585	1608	1612	1612

Revision by Ethnicity

Ethnicity	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
Asian	1,703	12,589.7	48	0.38 (0.28-0.50)
Euro/Other	168,973	1,462,693.0	9,531	0.65 (0.64-0.66)
Māori	15,774	124,240.4	907	0.73 (0.68-0.78)
Pacifica	2,154	16666.5	107	0.64 (0.53-0.78)

TABLE 1.23



Revision by ASA

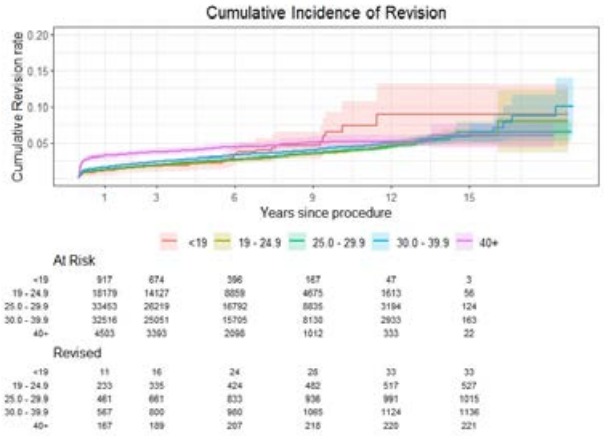
ASA Class	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
1	23,163	207,877.8	1,158	0.56 (0.53-0.59)
2	95,329	720,773.0	3,866	0.54 (0.52-0.55)
3	39,625	240783.9	1,526	0.63 (0.60-0.67)
4	1,266	5,430.0	44	0.81 (0.59-1.09)

TABLE 1.24

Revision by BMI

BMI	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
< 19	1047	5352.3	33	0.62 (0.42-0.87)
19 - 24	20587	116898.1	529	0.45 (0.41-0.49)
25 - 29	37716	218536.3	1016	0.46 (0.44-0.49)
30 - 39	37995	212495.9	1170	0.55 (0.52-0.58)
40+	4534	22973.3	192	0.84 (0.72-0.96)

TABLE 1.25



Effect of Age and Cementation

	N	Observed comp. years (ocys)	N Revised	Rate/100-comp. years	Lower (95% CI)	Upper (95% CI)
Cemented						
<40	69	970.5	15	1.55	0.87	2.55
40-54	654	9131.2	177	1.94	1.66	2.25
55-64	2765	37202.8	445	1.20	1.09	1.31
65-74	9987	119849.7	808	0.67	0.63	0.72
>=75	16312	132787.6	489	0.37	0.34	0.40
Uncemented						
<40	2365	25303.3	231	0.91	0.80	1.04
40-54	17885	183581.2	1493	0.81	0.77	0.86
55-64	30125	267467.0	1790	0.67	0.64	0.70
65-74	24606	183062.5	1011	0.55	0.52	0.59
>=75	9780	56246.7	387	0.69	0.62	0.76
Hybrid						
<40	544	6170.3	67	1.09	0.84	1.38
40-54	5211	56915.9	605	1.06	0.98	1.15
55-64	16043	164026.9	1133	0.69	0.65	0.73
65-74	31456	268753.8	1338	0.50	0.47	0.53
>=75	26577	162111.4	737	0.45	0.42	0.49

TABLE 1.26

Revision Rate by Adjunct Use

Image guided	N	Obs. comp. years (ocys)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Conventional	183062	1542505.9	10083	0.65	0.64	0.67
Computer Navigated	1095	6468.3	27	0.42	0.27	0.60

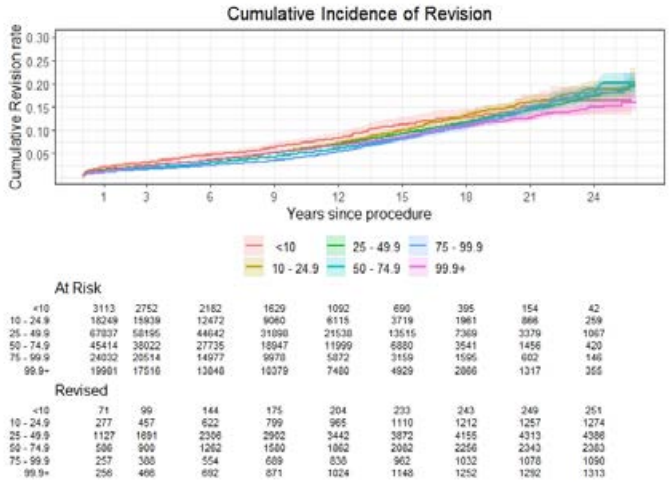
TABLE 1.27

Revision Rate by Number of Procedures Performed per Year

Operations per Year	N	Obs. comp. years (ocys)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
<10	3,413	31,600.2	251	0.79	0.70	0.90
10-24	19,809	179,443.9	1,275	0.71	0.67	0.75
25-49	73,924	649,898.2	4,401	0.68	0.66	0.70
50-74	49,814	397,716.4	2,392	0.60	0.58	0.63
75-99	26,092	207,919.5	1,092	0.53	0.49	0.56
>=100	21,327	207,002.8	1,315	0.64	0.60	0.67

TABLE 1.28

Revision Rate by Number of Procedures Performed per Year



Revision by Hospital Type

Public/Private	N	Obs. comp. years (ocys)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Public	90,479	786,332.4	4,972	0.63	0.61	0.65
Private	100,886	860,825.7	5,542	0.64	0.63	0.66

TABLE 1.29

Revision by Bearing Surface

Surfaces	N	Obs. comp. years (ocys)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Ceramic-Ceramic (CC)	1,6580	176,889.5	813	0.46	0.43	0.49
Ceramic-Metal (CM)	631	6,427.6	54	0.84	0.63	1.10
Ceramic-Poly (CP)	57,125	425,122.5	2,340	0.55	0.53	0.57
Metal-Metal (MM)	6,440	96,242.6	1,300	1.35	1.28	1.43
Metal-Poly (MP)	94,374	911,643.2	5,734	0.63	0.61	0.65

TABLE 1.30

Revision by Head Size

Head Size (mm)	N	Obs. comp. years (ocys)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
<=28	68,425	821,625.5	5,737	0.70	0.68	0.72
32	75,779	532,080.1	2,585	0.49	0.47	0.50
36	41,364	249,424.6	1,469	0.59	0.56	0.62
>36	4,444	42,273.7	734	1.74	1.61	1.87

TABLE 1.31

Revision by Head Size and Bearing Surface

Size	Surfaces	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
<32	CC	828	11,926.3	76	0.64	0.50	0.80
<32	CM	170	530.5	5	0.94	0.25	2.07
<32	CP	13,571	167,868.6	1,115	0.66	0.63	0.70
<32	MM	3,315	54,680.1	412	0.75	0.68	0.83
<32	MP	48,354	576,093.8	4,032	0.70	0.68	0.72
32	CC	4,334	52,403.0	238	0.45	0.40	0.52
32	CP	26,111	168,518.7	741	0.44	0.41	0.47
32	MM	481	7,005.9	64	0.91	0.70	1.16
32	MP	39,016	294,023.8	1,451	0.49	0.47	0.52
36	CC	8,884	91,094.3	418	0.46	0.42	0.51
36	CM	441	5,771.3	48	0.83	0.61	1.10
36	CP	16,817	86,425.1	458	0.53	0.48	0.58
36	MM	999	14,522.9	178	1.23	1.05	1.42
36	MP	6,947	41,057.6	250	0.61	0.54	0.69
>36	CC	2,488	21,213.3	81	0.38	0.30	0.47
>36	CM	7	98.5	1	1.02	0.00	5.66
>36	CP	58	209.8	5	2.38	0.00	5.22
>36	MM	1,643	20,021.3	644	3.22	2.97	3.47
>36	MP	36	290.4	1	0.34	0.00	1.92

TABLE 1.32

Revision by Bearing Surface and Age Group

Surfaces	Age Groups	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI	Lower (95% CI)	Upper (95% CI)
Ceramic-Ceramic	<40	936	9,585.5	58	0.61	0.46	0.78
	40-54	5,437	59,864.0	319	0.53	0.48	0.59
	55-64	6,562	72,476.2	285	0.39	0.35	0.44
	65-74	3,197	31,962.1	134	0.42	0.35	0.50
	>=75	448	3,001.7	17	0.57	0.33	0.91
Ceramic-Metal	<40	16	168.9	4	2.37	0.65	6.06
	40-54	183	2,275.8	21	0.92	0.57	1.41
	55-64	257	2,749.5	22	0.80	0.50	1.21
	65-74	129	1,042.3	7	0.67	0.24	1.32
	>=75	46	191.0	0	0.00	0.00	1.93
Ceramic-Poly	<40	924	8,228.2	82	1.00	0.79	1.23
	40-54	9,001	77,099.8	565	0.73	0.67	0.80
	55-64	19,569	154,443.0	829	0.54	0.50	0.57
	65-74	19,465	139,240.6	630	0.45	0.42	0.49
	>=75	8,166	46,110.9	234	0.51	0.44	0.58
Metal-Metal	<40	425	7,718.3	88	1.14	0.91	1.40
	40-54	2,497	41,284.4	556	1.35	1.24	1.46
	55-64	2,402	35,988.6	533	1.48	1.36	1.61
	65-74	778	9,443.0	108	1.14	0.93	1.38
	>=75	338	1,808.4	15	0.83	0.46	1.37
Metal-Poly	<40	406	5,838.1	64	1.10	0.84	1.40
	40-54	4,742	62,413.8	727	1.16	1.08	1.25
	55-64	15,650	189,196.5	1,585	0.84	0.80	0.88
	65-74	35,770	368,996.1	2,126	0.58	0.55	0.60
	>=75	37,806	285,198.6	1,232	0.43	0.41	0.46

TABLE 1.33

Surfaces	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Ceramic-Ceramic	16,580	176,889.5	813	0.46	0.43	0.49
Ceramic-Metal	631	6,427.6	54	0.84	0.63	1.10
Ceramic-Poly All	57,125	425,122.5	2,340	0.55	0.53	0.57
Ceramic - PS	7,941	109,020.2	894	0.82	0.77	0.88
Ceramic -PX	49,184	316,102.3	1,446	0.46	0.43	0.48
Metal-Metal	6,440	96,242.6	1,300	1.35	1.28	1.43
Metal-Poly All	94,374	911,643.2	5,734	0.63	0.61	0.65
Metal - PS	37,582	439,680.5	3,494	0.79	0.77	0.82
Metal - PX	56,792	471,962.6	2,240	0.47	0.46	0.49

TABLE 1.34

Cemented

Surfaces	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Ceramic-Poly	1,044	9,669.8	71	0.73	0.57	0.93
Metal-Metal	54	493.6	4	0.81	0.22	2.07
Metal-Poly	26,709	269,780.3	1738	0.64	0.61	0.68

TABLE 1.35

Uncemented

Surfaces	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Ceramic-Ceramic	12,837	139,284.7	669	0.48	0.44	0.52
Ceramic-Metal	535	6,241.4	53	0.85	0.64	1.11
Ceramic-Poly	38,495	280,783.9	1,554	0.55	0.53	0.58
Metal-Metal	5,436	84,804.0	1,180	1.39	1.31	1.47
Metal-Poly	19,490	186,754.1	1,264	0.68	0.64	0.72

TABLE 1.36

Hybrid

Surfaces	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Ceramic-Ceramic	3,739	37,594.1	144	0.38	0.32	0.45
Ceramic-Metal	92	180.1	1	0.56	0.01	3.09
Ceramic-Poly	17,586	134,668.8	715	0.53	0.49	0.57
Metal-Metal	950	10,945.0	116	1.06	0.88	1.27
Metal-Poly	48,175	455,108.8	2,732	0.60	0.58	0.62

TABLE 1.37

Cement Status and Proportion of Revision-Free Cases by Years from Surgery

Years	All		Un-Cemented		Cemented		Hybrid	
	% Revision-free	N	% Revision-free	N	% Revision-free	N	% Revision-free	N
1	98.65	178,626	98.45	77,386	99.10	28,352	98.70	72,888
2	98.22	165,212	97.97	71,043	98.66	27,125	98.32	67,044
3	97.81	152,938	97.50	65,596	98.31	25,787	97.94	61,555
4	97.43	140,489	97.04	59,937	97.98	24,220	97.64	56,332
5	97.07	128,118	96.62	54,581	97.67	22,623	97.31	50,914
6	96.66	115,856	96.13	49,312	97.31	20,858	96.97	45,686
7	96.21	104,196	95.67	44,420	96.83	19,114	96.56	40,662
8	95.78	92,647	95.20	39,530	96.32	17,326	96.19	35,791
9	95.25	81,891	94.63	35,078	95.75	15,591	95.73	31,222
10	94.67	71,836	94.11	30,993	94.91	13,775	95.22	27,068
11	94.06	62,558	93.53	27,169	94.08	12,093	94.68	23,296
12	93.39	54,096	92.90	23,580	93.15	10,483	94.11	20,033
13	92.64	46,356	92.18	20,338	92.07	8,961	93.48	17,057
14	91.86	39,377	91.51	17,235	91.00	7,670	92.74	14,472
15	91.08	32,892	90.77	14,110	90.30	6,584	91.86	12,198
16	90.15	27,155	89.93	11,293	89.34	5,588	90.86	10,274
17	89.21	22,090	89.06	8,965	88.24	4,632	89.93	8,493
18	88.41	17,727	88.31	7,040	87.45	3,835	89.07	6,852
19	87.46	13,976	87.45	5,422	86.40	3,104	88.06	5,450
20	86.67	10,667	86.72	4,103	85.61	2,408	87.22	4,156
21	85.74	7,774	85.60	2,963	84.67	1,823	86.47	2,988
22	84.74	5,532	84.77	2,072	84.06	1,353	85.08	2,107
23	83.75	3,726	83.69	1,362	82.92	975	84.27	1,389

TABLE 1.38

Revision for Dislocation

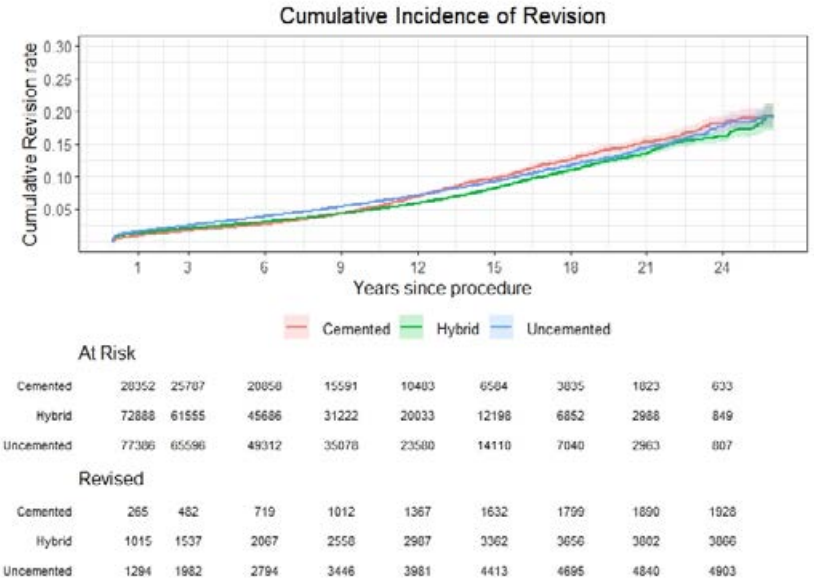
Approach	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Anterior	8,672	62,623.6	67	0.11	0.08	0.14
Posterior	136,243	1,115,825.0	1,705	0.15	0.15	0.16
Lateral	38,319	391,797.2	291	0.07	0.07	0.08

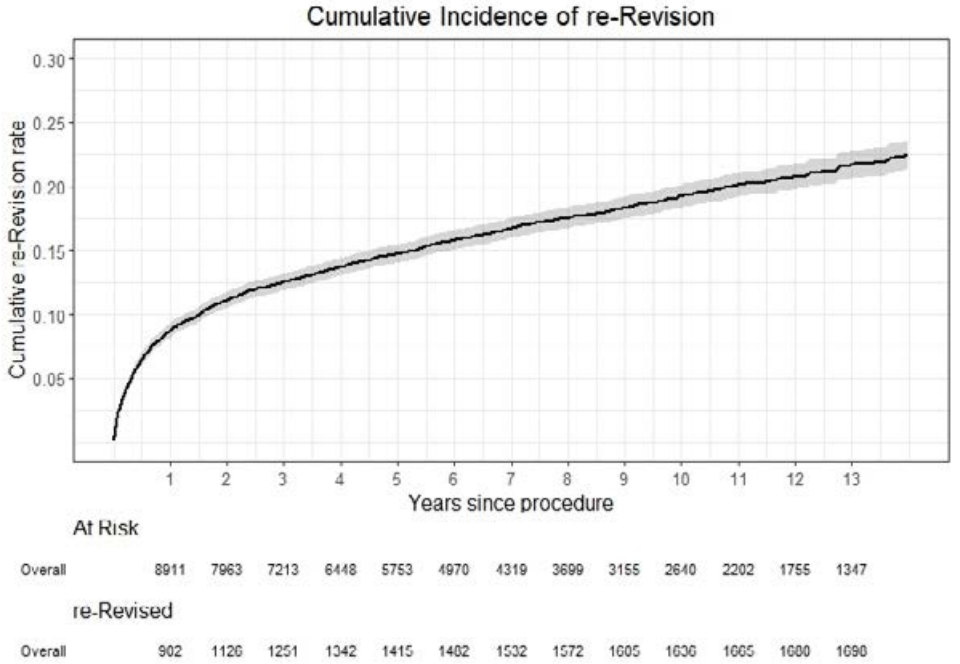
TABLE 1.39

Revision by Cement Status

Cementation	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)	Lower (95% CI)	Upper (95% CI)
Cemented	29,787	299,941.9	1,934	0.64	0.62	0.67
Uncemented	84,761	715,660.7	4,912	0.69	0.67	0.71
Hybrid	79,831	657,978.4	3,880	0.59	0.57	0.61

TABLE 1.40





Revisions in Cases that have had a Prior Revision

	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
Revised	10,726	68,881.9	1,748	2.54 (2.42-2.66)

TABLE 1.41

Classification of Re-Revisions as Major or Minor

	N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
Minor	2,617	15,823.9	543	3.43 (3.15-3.73)
Major	8,045	52,688.6	1,187	2.25 (2.13-2.38)

TABLE 1.42

Patient Recorded Outcome Measures

Patient based questionnaire outcomes after primary hip arthroplasty 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%, deemed ample to provide powerful statistical analysis.

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

The questionnaire responses are grouped according to the classification system published by Kalairajah et al, 2005 (see appendix 1).

This groups each score into four categories:

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

TABLE 1.43

For the twenty-three-year period, there were 37,401 primary hip questionnaire responses registered six months post-surgery. The average hip score was 40.3 (standard deviation 7.6, range 0-48). At six months post-surgery, 84% had an excellent or good score.

Kalairajah Classification at 6 Months	N	%
Poor	2,304	6.5
Fair	3,447	9.7
Good	9,897	27.8
Excellent	19,970	56.1

TABLE 1.44

Questionnaires at five years post-surgery

All patients who had a six- month questionnaire registered, 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 14,893 individual patients.

At five years post-surgery, 89% of these patients achieved an excellent or good score and had an average of 42.4 (standard deviation 7.0, range 1 – 48).

Kalairajah Classification at 5 Years	N	%
Poor	585	4.3
Fair	868	6.4
Good	2,603	19.3
Excellent	9,412	69.9

TABLE 1.45

Questionnaires at ten years post-surgery

All patients who had a six-month questionnaire registered, 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 10,753 individual patients.

At ten years post-surgery, 88% of these patients achieved an excellent or good score and had an average of 42.0 (standard deviation 7.4, range 2-48).

Kalairajah Classification at 10 Years	N	%
Poor	522	5.5
Fair	677	7.1
Good	1,891	19.8
Excellent	6,480	67.7

TABLE 1.46

Questionnaires at fifteen years post-surgery

All patients who had a six- month questionnaire registered, 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 4,882 individual patients.

At fifteen years post-surgery, 86% of these patients achieved an excellent or good score and had an average of 41.5 (standard deviation 7.9, range 0-48).

Kalairajah Classification at 15 Years	N	%
Poor	251	6.4
Fair	302	7.7
Good	811	20.6
Excellent	2,582	65.4

TABLE 1.47

Questionnaires at twenty years post-surgery

All patients who had a six- month questionnaire registered, 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 1,865 individual patients.

At twenty years post-surgery, 84% of these patients achieved an excellent or good score and had an average of 40.8 (standard deviation 8.5, range 4-48.)

Kalairajah Classification at 20 Years	N	%
Poor	132	8.1
Fair	136	8.3
Good	351	21.5
Excellent	1,015	62.1

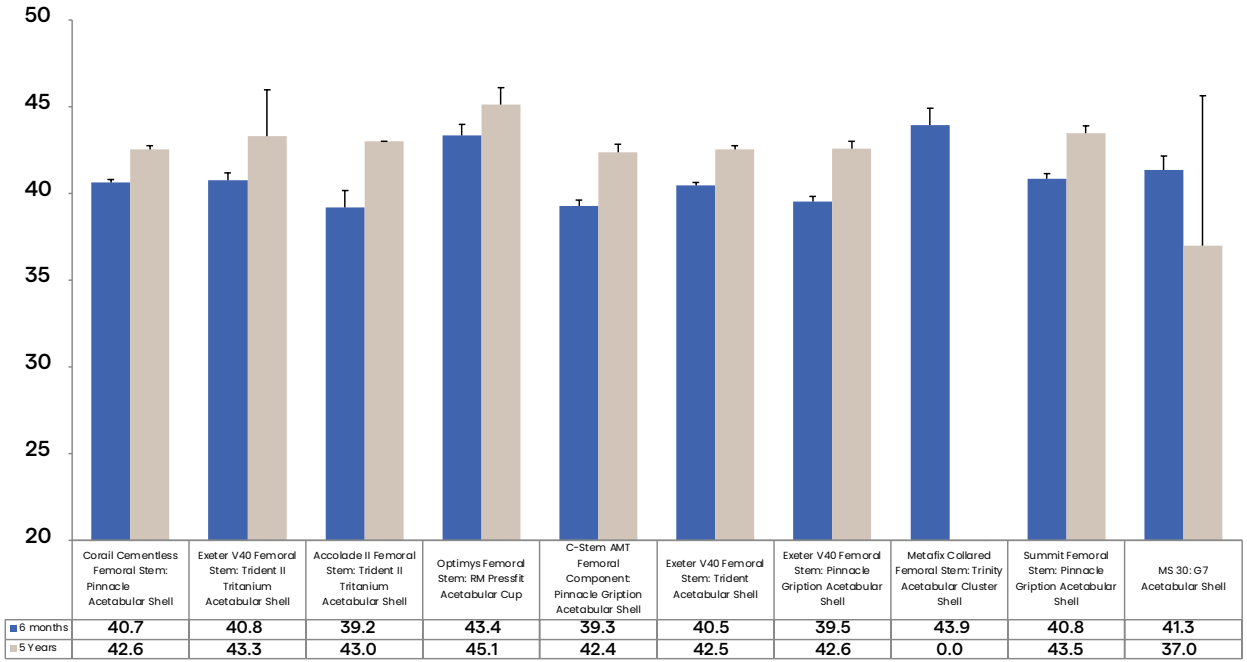
TABLE 1.48

Oxford Hip Score at 6 months post - Total Hip Arthroplasty vs BMI

BMI	N	Mean	SE
< 19	113	39.42	0.745
19 - 24	2,795	41.24	0.133
25 - 29	4,827	40.79	0.102
30 - 39	4,177	39.46	0.120
40+	384	37.30	0.437
Total	**12,296**	**40.32**	**0.067**

TABLE 1.49

Mean Oxford scores at 6 months and 5 years for Top 10 hip combinations.



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

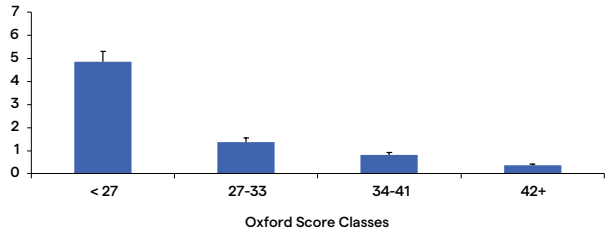
By plotting the patients' six-month scores in the Kalairajah groupings against the proportion of hips revised for that same group it demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 13 times the risk of a revision within two years compared to a person with a score >42.

Risk of Revision within Two Years of the Six-month Score Date versus Kalairajah Score Group.

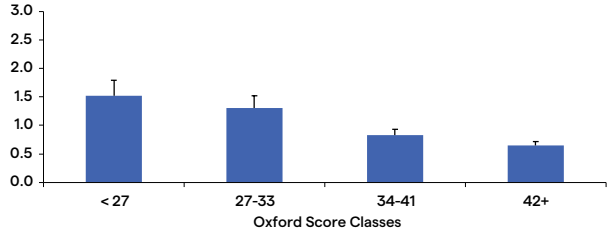
Kalairajah Classification at 6 months	Follow up to 2 Years (N)	Revised within 2 years (N)	%	Std error
Poor	2,304	112	4.86	0.45
Fair	3,447	47	1.36	0.20
Good	9,897	82	0.83	0.09
Excellent	19,970	74	0.37	0.04

TABLE 1.50

Risk of Revision within 2 years by Oxford score at 6 months



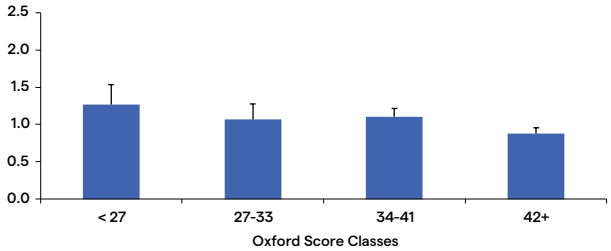
Risk of Revision (%) after 2 to 4 years by Oxford score at 6 months



Kalairajah Classification at 6 months	Follow up 2 to 4 years (N)	Revised 2 to 4 years (N)	%	Std error
Poor	2,041	31	1.52	0.27
Fair	3,055	40	1.31	0.21
Good	8,907	74	0.83	0.10
Excellent	18,220	119	0.65	0.06

TABLE 1.51

Risk of Revision (%) between 4 and 6 years by Oxford score at 6 months



Kalairajah Classification at 6 months	Follow up 4 to 6 years (N)	Revised	%	Std error
Poor	1,738	22	1.27	0.27
Fair	2,610	28	1.07	0.20
Good	7,814	86	1.10	0.12
Excellent	16,354	144	0.88	0.07

TABLE 1.52

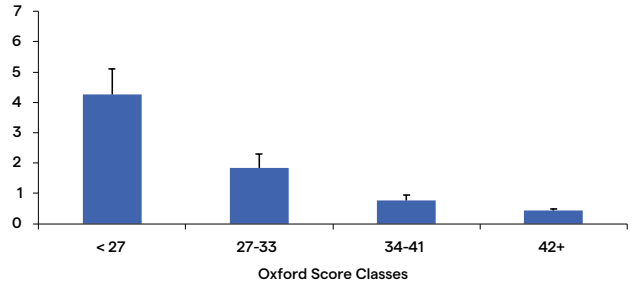
Five-year score and revision arthroplasty

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.

Kalairajah Classification at 5 years	Revision to 2 Years	N revised	%	Std error
Poor	585	25	4.27	0.84
Fair	868	16	1.84	0.46
Good	2,603	20	0.77	0.17
Excellent	9,412	40	0.42	0.07

TABLE 1.53

Risk of Revision within 2 years by Oxford score at 5 years

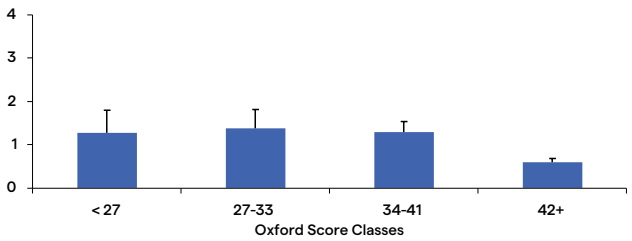


Revision risk versus Kalairajah Score Group within two to four years of the five-year score date.

Kalairajah Classification at 5 years	Revision 2 to 4 years	N revised	%	Std error
Poor	471	6	1.27	0.52
Fair	723	10	1.38	0.43
Good	2,176	28	1.29	0.24
Excellent	8,184	49	0.60	0.09

TABLE 1.54

Risk of Revision between 2 and 4 years by Oxford score at 5 years



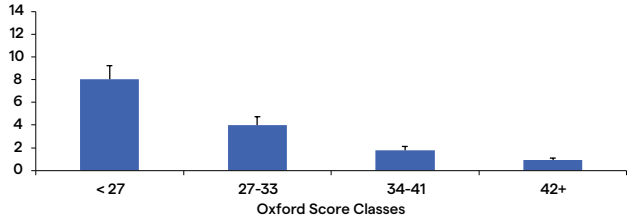
Ten-year score and revision arthroplasty

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 Classification at 10 years	Revision to 2 Years	N revised	%	Std error
Poor	522	42	8.05	1.19
Fair	677	27	3.99	0.75
Good	1,891	34	1.80	0.31
Excellent	6,480	61	0.94	0.12

TABLE 1.55

Risk of Revison to 2 years by Oxford score at 10 years



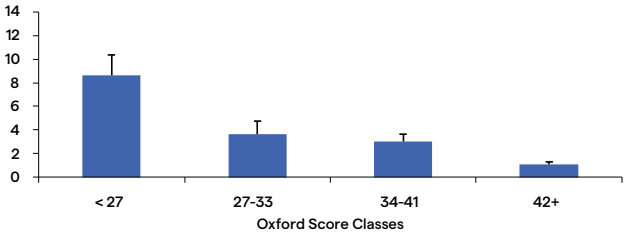
Fifteen-year score and revision arthroplasty

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 Classification at 15 years	Revision to 2 Years	N revised	%	Std error
Poor	251	25	9.96	1.89
Fair	302	11	3.64	1.08
Good	811	28	3.45	0.64
Excellent	2,582	28	1.08	0.20

TABLE 1.56

Revison (%) within 2 years by Oxford score at 15 years

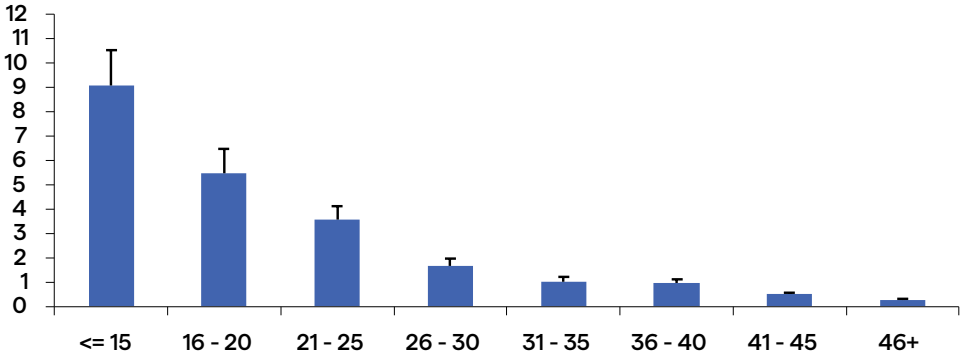


In view of the large number of six- month Oxford scores it is possible with statistical significance to further break down the score groupings to demonstrate an even more convincing relationship between score and risk of revision within two years.

Score Group at 6 months	Revision to 2 Years	N revised	%	Std error
<= 15	399	38	9.52	1.47
16 - 20	514	29	5.64	1.02
21 - 25	1,083	39	3.60	0.57
26 - 30	1,984	33	1.66	0.29
31 - 35	3,495	36	1.03	0.17
36 - 40	6,301	60	0.95	0.12
41 - 45	11,358	55	0.48	0.07
46+	10,484	25	0.24	0.05

TABLE 1.57

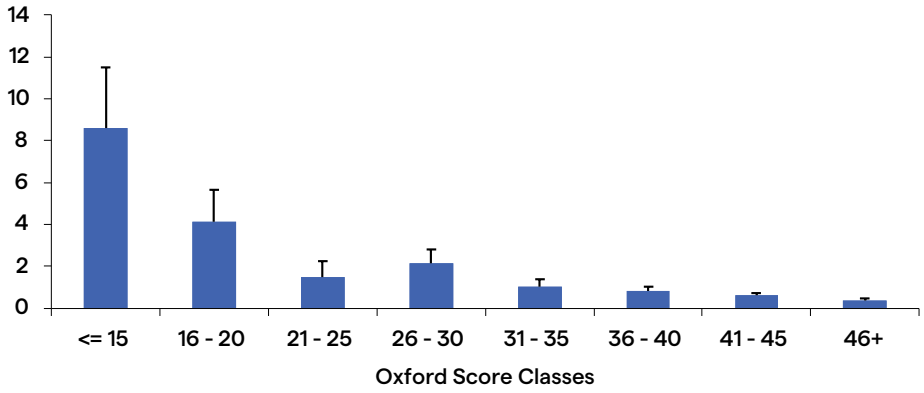
Risk of Revision (%) within 2 years by Oxford score at 6 months



Kalairajah grouping of Oxford Score at 5 years	Revision to 2 Years	N revised	%	Std error
<= 15	90	9	10.00	3.16
16 - 20	163	7	4.29	1.59
21 - 25	258	6	2.33	0.94
26 - 30	497	11	2.21	0.66
31 - 35	848	9	1.06	0.35
36 - 40	1,696	14	0.83	0.22
41 - 45	3,851	22	0.57	0.12
46+	6,065	23	0.38	0.08

TABLE 1.58

Risk of Revision (%) within 2 years by Oxford score at 5 years



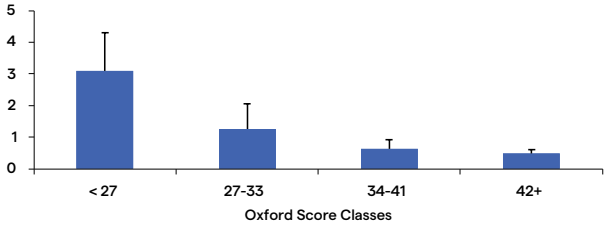
Prediction of second revision from six-month score following first revision

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.

Revision hip questionnaire responses

There were 12,421 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 34.70 (standard deviation 10.07, range 0-48).

Re-Revison (%) within 2 years by Oxford score at Revision



All Matches > 50 procedure sorted by Femoral Component

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
ABGII Acetabular Cup Femoral Stem	ABGII Acetabular Cup	109	1,879.0	30	1.60	1.06	2.25
ABGII Femoral Stem	Delta-PF Acetabular Cup	107	1,754.2	14	0.80	0.44	1.34
ABGII Femoral Stem	Duraloc Acetabulum	274	4,842.0	120	2.48	2.05	2.96
ABGII Femoral Stem	Pinnacle Gription Acetabular Shell	67	974.6	6	0.62	0.23	1.34
ABGII Femoral Stem	RM Pressfit Acetabular Cup	91	696.5	9	1.29	0.59	2.45
ABGII Femoral Stem	Trident Acetabular Shell	297	4,616.2	43	0.93	0.67	1.25
Accolade Femoral Stem	Mueller PE cup	114	1,432.7	12	0.84	0.43	1.46
Accolade Femoral Stem	Pinnacle Gription Acetabular Shell	180	2,384.3	4	0.17	0.05	0.43
Accolade Femoral Stem	Trident Acetabular Shell	1,204	18,567.6	69	0.37	0.29	0.47
Accolade Femoral Stem	Trident PSL Acetabular Shell	663	10,280.0	41	0.40	0.28	0.54
Accolade Femoral Stem	Tritanium Acetabular Shell	152	1,842.6	5	0.27	0.07	0.59
Accolade II Femoral Stem	Continuum TM Acetabulum	356	1,324.8	15	1.13	0.63	1.87
Accolade II Femoral Stem	Delta-TT Acetabular Cup	103	562.5	5	0.89	0.29	2.07
Accolade II Femoral Stem	Fitmore Acetabulum	144	645.1	4	0.62	0.17	1.59
Accolade II Femoral Stem	G7 Osseo Ti Acetabular Shell	205	192.3	1	0.52	0.00	2.43
Accolade II Femoral Stem	RM Pressfit Acetabular Cup	333	1,329.4	19	1.43	0.86	2.23
Accolade II Femoral Stem	Trident Acetabular Shell	1,723	10,184.4	47	0.46	0.34	0.61
Accolade II Femoral Stem	Trident II Tritanium Acetabular Shell	1,804	2,759.7	34	1.23	0.85	1.72
Accolade II Femoral Stem	Tritanium Acetabular Shell	1,580	10,119.9	60	0.59	0.45	0.76
Actis Duofix Femoral Stem	Pinnacle Gription Acetabular Shell	213	401.7	5	1.24	0.40	2.90
AMI Stem-C	Impact Acetabular Shell	62	35.6	0	0.00	0.00	10.38
AMI Stem-C	Mpact DM Acetabular Shell	269	374.4	1	0.27	0.00	1.25
AMI Stem-P	Impact Acetabular Shell	56	24.5	1	4.08	0.10	22.73
AMI Stem-P	Mpact DM Acetabular Shell	184	315.8	0	0.00	0.00	1.17
AML MMA Femoral Stem	Duraloc Acetabulum	79	1,364.8	18	1.32	0.78	2.08
AML Std Femoral Stem	Duraloc Acetabulum	52	905.4	9	0.99	0.45	1.89

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Anthology Porous Femoral Stem	BHR Acetabular Cup	94	945.4	62	6.56	5.03	8.41
Anthology Porous Femoral Stem	R3 No Hole HA Coated Acetabulum	68	660.1	37	5.61	3.95	7.73
Avenir Complete Uncemented Stem	G7 Osseo Ti Acetabular Shell	63	154.0	1	0.65	0.02	3.62
Avenir Muller Uncemented Stem	Continuum TM Acetabulum	181	1,833.5	14	0.76	0.42	1.28
Avenir Muller Uncemented Stem	Fitmore Acetabulum	70	579.2	2	0.35	0.04	1.25
Avenir Muller Uncemented Stem	Pinnacle Gription Acetabular Shell	99	1,322.2	4	0.30	0.08	0.77
Avenir Muller Uncemented Stem	RM Acetabular Cup	79	893.2	3	0.34	0.07	0.98
Avenir Muller Uncemented Stem	RM Pressfit Acetabular Cup	53	423.4	1	0.24	0.01	1.32
Avenir Muller Uncemented Stem	Tritanium Acetabular Shell	91	1,053.9	3	0.28	0.06	0.83
Basis Primary Femoral Stem	Reflection All Poly Acetabular Shell	130	1,317.3	4	0.30	0.08	0.78
CBC Stem	Expansys Acetabular Shell	182	2,385.4	32	1.34	0.92	1.89
CBC Stem	Fitmore Acetabulum	59	909.1	5	0.55	0.18	1.28
CBC Stem	RM Pressfit Acetabular Cup	443	4,777.7	30	0.63	0.42	0.88
CCA Stainless Steel Femoral Stem	CCB	91	862.2	5	0.58	0.16	1.27
CCA Stainless Steel Femoral Stem	CCB Low Profile Cup PE	688	6,465.0	36	0.56	0.38	0.76
CCA Stainless Steel Femoral Stem	Contemporary Acetabulum	78	859.6	10	1.16	0.56	2.14
CCA Stainless Steel Femoral Stem	RM Pressfit Acetabular Cup	139	1,533.8	8	0.52	0.23	1.03
Charnley Acetabular Cup Femoral Stem	Charnley Acetabular Cup	804	11,050.5	69	0.62	0.49	0.79
CLS Spotorno Stem	Allofit Acetabular Cup	192	2,704.3	25	0.92	0.60	1.36
CLS Spotorno Stem	Artek Acetabular Cup	59	848.6	29	3.42	2.24	4.84
CLS Spotorno Stem	CLS Expansion Acetabulum	1,263	20,032.5	172	0.86	0.74	1.00
CLS Spotorno Stem	CLW Anchorage Ring	118	2,296.5	19	0.83	0.50	1.29
CLS Spotorno Stem	Continuum TM Acetabulum	1,191	8,346.5	40	0.48	0.34	0.65
CLS Spotorno Stem	Duraloc Acetabulum	712	11,430.1	144	1.26	1.06	1.48
CLS Spotorno Stem	Durom Acetabulum	198	2,613.2	76	2.91	2.27	3.62
CLS Spotorno Stem	Fitek Acetabular Shell	66	1,465.3	13	0.89	0.47	1.52

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
CLS Spotorno Stem	Fitmore Acetabulum	2,451	35,275.4	174	0.49	0.42	0.57
CLS Spotorno Stem	Monoblock Acetabular Cup	80	1,196.9	8	0.67	0.29	1.32
CLS Spotorno Stem	Morscher Acetabulum	1,700	30,473.6	150	0.49	0.42	0.58
CLS Spotorno Stem	Pinnacle Gription Acetabular Shell	133	1,207.9	5	0.41	0.11	0.91
CLS Spotorno Stem	Reflection All Poly Acetabular Shell	408	4,959.3	26	0.52	0.33	0.76
CLS Spotorno Stem	RM Acetabular Cup	809	8630.9	65	0.75	0.58	0.96
CLS Spotorno Stem	Trabecular Metal Acetabular Shell	59	673.9	3	0.45	0.09	1.30
CLS Spotorno Stem	Trident PSL Acetabular Shell	153	2,303.5	16	0.69	0.40	1.13
CLS Spotorno Stem	Trilogy Acetabular Shell	785	7,818.9	42	0.54	0.38	0.72
CLS Spotorno Stem	Tritanium Acetabular Shell	89	841.4	5	0.59	0.16	1.30
Contemporary Femoral Stem	Contemporary Acetabulum	70	995.3	12	1.21	0.62	2.11
Corail Cemented Femoral Stem	Pinnacle Gription Acetabular Shell	82	64.5	0	0.00	0.00	5.72
Corail Cementless Femoral Stem	ASR Acetabular Cup	155	1,541.8	88	5.71	4.55	7.00
Corail Cementless Femoral Stem	Continuum TM Acetabulum	340	2,919.0	14	0.48	0.25	0.78
Corail Cementless Femoral Stem	DeltaMotion Cup	78	967.5	3	0.31	0.04	0.83
Corail Cementless Femoral Stem	Delta-PF Acetabular Cup	83	1,290.6	3	0.23	0.05	0.68
Corail Cementless Femoral Stem	Duraloc Acetabulum	464	6,692.9	70	1.05	0.82	1.32
Corail Cementless Femoral Stem	Fitmore Acetabulum	369	2,792.1	21	0.75	0.47	1.15
Corail Cementless Femoral Stem	G7 Acetabular Shell	156	685.7	3	0.44	0.09	1.28
Corail Cementless Femoral Stem	Monoblock Acetabular Cup	95	1,377.5	10	0.73	0.35	1.34
Corail Cementless Femoral Stem	Pinnacle Gription Acetabular Shell	20,093	129,484.4	712	0.55	0.51	0.59
Corail Cementless Femoral Stem	Reflection All Poly Acetabular Shell	158	2,077.3	6	0.29	0.11	0.63
Corail Cementless Femoral Stem	RM Pressfit Acetabular Cup	194	1,411.5	10	0.71	0.34	1.30
Corail Cementless Femoral Stem	Trident II Tritanium Acetabular Shell	62	193.7	3	1.55	0.32	4.53
Corail Cementless Femoral Stem	Trident PSL Acetabular Shell	111	1,026.6	7	0.68	0.27	1.40
Corail Cementless Femoral Stem	Trilogy Acetabular Shell	283	2,161.1	7	0.32	0.13	0.67

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Corail Cementless Femoral Stem	Tritanium Acetabular Shell	175	1,764.2	4	0.23	0.06	0.58
Corail Cementless Femoral Stem	Ultima Acetabular Shell	134	1,339.3	4	0.30	0.08	0.76
Corin Paragon Cementless Femoral Stem	Trinity Acetabular Cluster Shell	90	46.0	0	0.00	0.00	8.02
CPCS Femoral Stem	R3 No Hole HA Coated Acetabulum	427	2,510.9	9	0.36	0.16	0.68
CPCS Femoral Stem	Reflection All Poly Acetabular Shell	65	799.2	7	0.88	0.35	1.80
CPT Femoral Stem	Continuum TM Acetabulum	2,049	14,253.0	85	0.60	0.48	0.74
CPT Femoral Stem	Delta-TT Acetabular Cup	143	852.8	5	0.59	0.19	1.37
CPT Femoral Stem	Duraloc Acetabulum	212	2,803.6	20	0.71	0.44	1.10
CPT Femoral Stem	Fitmore Acetabulum	195	1,884.1	16	0.85	0.49	1.38
CPT Femoral Stem	G7 Acetabular Shell	120	534.0	9	1.69	0.77	3.20
CPT Femoral Stem	G7 Osseo Ti Acetabular Shell	122	267.6	5	1.87	0.61	4.36
CPT Femoral Stem	Monoblock Acetabular Cup	84	1,246.6	8	0.64	0.28	1.26
CPT Femoral Stem	Pinnacle Gription Acetabular Shell	67	709.5	2	0.28	0.02	0.90
CPT Femoral Stem	Trident PSL Acetabular Shell	144	2,248.3	13	0.58	0.29	0.96
CPT Femoral Stem	Trilogy Acetabular Shell	845	9,172.8	71	0.77	0.60	0.97
CPT Femoral Stem	Tritanium Acetabular Shell	85	1,032.4	9	0.87	0.40	1.65
CPT Femoral Stem	ZCA All Poly Acetabular Cup	645	7,225.3	44	0.61	0.44	0.82
C-Stem AMT Femoral Component	Duraloc Acetabulum	96	1,232.9	9	0.73	0.33	1.39
C-Stem AMT Femoral Component	Elite Plus Ogee	67	709.5	2	0.28	0.03	1.02
C-Stem AMT Femoral Component	G7 Osseo Ti Acetabular Shell	153	147.9	8	5.41	2.12	10.21
C-Stem AMT Femoral Component	Marathon Acetabular Cup	459	3,670.9	22	0.60	0.38	0.91
C-Stem AMT Femoral Component	Pinnacle Gription Acetabular Shell	4,502	24,647.3	167	0.68	0.58	0.79
C-Stem AMT Femoral Component	RM Pressfit Acetabular Cup	178	1,308.0	10	0.76	0.37	1.41
Echo Bi-Metric Femoral Component	Continuum TM Acetabulum	215	1,088.0	7	0.64	0.26	1.33
Echo Bi-Metric Femoral Component	Exceed ABT Ringloc-X Acetabulum	57	625.4	1	0.16	0.00	0.89
Echo Bi-Metric Femoral Component	G7 Acetabular Shell	1,282	5,756.1	30	0.52	0.35	0.74

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Echo Bi-Metric Femoral Component	G7 Osseo Ti Acetabular Shell	631	1,260.4	24	1.90	1.22	2.83
Elite Plus Femoral Component	Charnley Acetabular Cup	343	4,767.0	39	0.82	0.58	1.12
Elite Plus Femoral Component	Duraloc Acetabulum	614	8,550.4	137	1.60	1.34	1.89
Elite Plus Femoral Component	Elite Plus LPW	283	3,523.0	18	0.51	0.30	0.81
Elite Plus Femoral Component	Elite Plus Ogee	109	1,166.7	6	0.51	0.19	1.12
Exeter V40 Femoral Stem	Avantage Acetabular Cup	112	261.1	5	1.92	0.62	4.47
Exeter V40 Femoral Stem	Bio-clad poly Acetabular Cup	252	2,680.9	15	0.56	0.31	0.92
Exeter V40 Femoral Stem	CCB Low Profile Cup PE	601	4,997.4	22	0.44	0.28	0.67
Exeter V40 Femoral Stem	CLS Expansion Acetabulum	217	2,935.2	13	0.44	0.24	0.76
Exeter V40 Femoral Stem	Contemporary Acetabulum	8,193	87,560.1	533	0.61	0.56	0.66
Exeter V40 Femoral Stem	Continuum TM Acetabulum	3,202	25,146.3	144	0.57	0.48	0.67
Exeter V40 Femoral Stem	Delta-TT Acetabular Cup	458	2,541.5	15	0.59	0.32	0.95
Exeter V40 Femoral Stem	Duraloc Acetabulum	1,606	23,646.1	286	1.21	1.07	1.36
Exeter V40 Femoral Stem	Exeter Acetabular Cup	2,991	36,005.4	247	0.69	0.60	0.78
Exeter V40 Femoral Stem	Exeter X3 Rimfit Acetabular Cup	3,436	21,453.1	95	0.44	0.36	0.54
Exeter V40 Femoral Stem	Fitmore Acetabulum	1,248	11,287.2	18	0.16	0.09	0.25
Exeter V40 Femoral Stem	G7 Acetabular Shell	390	1,839.3	7	0.38	0.15	0.78
Exeter V40 Femoral Stem	G7 Osseo Ti Acetabular Shell	584	966.6	16	1.66	0.91	2.62
Exeter V40 Femoral Stem	Monoblock Acetabular Cup	136	2,214.7	7	0.32	0.13	0.65
Exeter V40 Femoral Stem	Morscher Acetabulum	1,208	19,617.2	93	0.47	0.38	0.58
Exeter V40 Femoral Stem	Mueller PE cup	222	2,878.0	14	0.49	0.27	0.82
Exeter V40 Femoral Stem	Osteolock Acetabulum	1,103	16,646.8	105	0.63	0.51	0.76
Exeter V40 Femoral Stem	Pinnacle Gription Acetabular Shell	4,213	28,226.3	115	0.41	0.34	0.49
Exeter V40 Femoral Stem	PolarCup cemented	115	394.2	1	0.25	0.01	1.41
Exeter V40 Femoral Stem	Polymax Acetabular Shell	85	541.3	2	0.37	0.04	1.33
Exeter V40 Femoral Stem	R3 No Hole HA Coated Acetabulum	1,054	6,247.6	28	0.45	0.30	0.65

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Exeter V40 Femoral Stem	Reflection All Poly Acetabular Shell	1,564	15,345.7	57	0.37	0.28	0.48
Exeter V40 Femoral Stem	RM Pressfit Acetabular Cup	3,474	25,749.8	88	0.34	0.27	0.42
Exeter V40 Femoral Stem	Trabecular Metal Acetabular Shell	283	1,959.6	21	1.07	0.66	1.64
Exeter V40 Femoral Stem	Trident Acetabular Shell	12,176	95,467.1	375	0.39	0.35	0.43
Exeter V40 Femoral Stem	Trident II Clusterhole HA Shell	366	503.3	2	0.40	0.02	1.27
Exeter V40 Femoral Stem	Trident II Tritanium Acetabular Shell	5,260	9,469.3	80	0.84	0.67	1.05
Exeter V40 Femoral Stem	Trident PSL Acetabular Shell	3,147	34,223.5	126	0.37	0.31	0.44
Exeter V40 Femoral Stem	Trilogy Acetabular Shell	3,861	37,315.9	133	0.36	0.30	0.42
Exeter V40 Femoral Stem	Tritanium Acetabular Shell	3,927	30,246.6	137	0.45	0.38	0.54
Exeter V40 Femoral Stem	Weber PE Acetabular Cup	72	961.3	2	0.21	0.03	0.75
Exeter V40 Femoral Stem	ZCA All Poly Acetabular Cup	217	1,730.5	4	0.23	0.06	0.59
Friendly Femoral Stem	Delta-PF Acetabular Cup	179	2,538.0	7	0.28	0.11	0.57
Friendly Femoral Stem	Delta-TT Acetabular Cup	69	711.2	7	0.98	0.40	2.03
Friendly Femoral Stem	Mueller Cup	60	375.2	5	1.33	0.43	3.11
FTC Femoral Stem	DeltaMotion Cup	100	1,442.5	3	0.21	0.04	0.61
Furlong Evolution Collared Stem	Delta-PF Acetabular Cup	181	350.3	0	0.00	0.00	1.05
Furlong H-AC Stem	Furlong Acetabular Cup	102	1,477.2	11	0.74	0.37	1.33
H-Max C Lateralized Cementless Stem	Delta-TT Acetabular Cup	91	385.7	7	1.81	0.73	3.74
H-Max C Std Cementless Stem	Delta-TT Acetabular Cup	87	340.6	2	0.59	0.07	2.12
H-Max M Modular Stem	Delta-PF Acetabular Cup	71	799.3	10	1.25	0.60	2.30
H-Max M Modular Stem	Delta-TT Acetabular Cup	86	1,062.3	8	0.75	0.33	1.48
H-Max S Lateralizing Cementless Stem	Delta-PF Acetabular Cup	298	1,534.1	11	0.72	0.34	1.24
H-Max S Lateralizing Cementless Stem	Delta-TT Acetabular Cup	697	4,694.2	32	0.68	0.47	0.96
H-Max S Std Cementless Stem	Delta-PF Acetabular Cup	132	687.2	5	0.73	0.20	1.59
H-Max S Std Cementless Stem	Delta-TT Acetabular Cup	571	3,502.9	21	0.60	0.37	0.92
Insignia Hip Stem	Trident II Tritanium Acetabular Shell	112	69.3	0	0.00	0.00	5.32

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Medacta Lateral Straight Stem	Mpact DM Acetabular Shell	183	238.0	1	0.42	0.01	2.34
Medacta Lateral straight stem	Continuum TM Acetabulum	78	806.8	5	0.62	0.17	1.36
Medacta Lateral straight stem	Mueller PE cup	766	8,193.3	46	0.56	0.41	0.75
Medacta Lateral Straight Stem	RM Acetabular cup	705	8541.8	60	0.70	0.54	0.90
Medacta Lateral straight stem	Trilogy Acetabular Shell	71	767.9	15	1.95	1.09	3.22
Medacta Lateral straight stem	Weber PE Acetabular Cup	284	3,258.4	11	0.34	0.17	0.60
Medacta Lateral straight stem	ZCA All Poly Acetabular Cup	164	1,660.0	1	0.06	0.00	0.34
M/L Taper Femoral Stem	Continuum TM Acetabulum	1,047	9,972.5	48	0.48	0.35	0.63
M/L Taper Femoral Stem	Delta-TT Acetabular Cup	64	628.1	6	0.96	0.35	2.08
M/L Taper Femoral Stem	Trident Acetabular Shell	328	2,532.2	7	0.28	0.11	0.57
M/L Taper Femoral Stem	Trilogy Acetabular Shell	220	2,964.2	14	0.47	0.26	0.79
Mallory-Head Press-Fit Femoral Component	M2A Acetabular Cup	103	1,647.3	20	1.21	0.74	1.88
Master SL Monolithic Cementless Stem	Delta-TT Acetabular Cup	131	723.9	8	1.11	0.48	2.18
Metafix Collared Femoral Stem	Trinity Acetabular Cluster Shell	477	536.8	5	0.93	0.30	2.17
Metafix Collarless Femoral Stem	Trinity Acetabular Cluster Shell	144	347.6	3	0.86	0.18	2.52
MS 30	Contemporary Acetabulum	128	1,376.0	12	0.87	0.45	1.52
MS 30	Continuum TM Acetabulum	612	4,102.8	14	0.34	0.18	0.56
MS 30	Duraloc Acetabulum	88	1,525.7	15	0.98	0.55	1.62
MS 30	Fitmore Acetabulum	2,891	26,339.5	76	0.29	0.23	0.36
MS 30	G7 Acetabular Shell	708	1,354.6	12	0.89	0.43	1.50
MS 30	G7 Osseo Ti Acetabular Shell	185	392.0	3	0.77	0.16	2.24
MS 30	Morscher Acetabulum	804	12,015.7	78	0.65	0.51	0.81
MS 30	Mueller PE cup	502	5,301.6	18	0.34	0.20	0.54
MS 30	Pinnacle Gription Acetabular Shell	369	1,100.3	4	0.36	0.08	0.86
MS 30	RM Pressfit Acetabular Cup	90	989.5	5	0.51	0.14	1.11
MS 30	Trident II Tritanium Acetabular Shell	109	86.4	1	1.16	0.00	5.41

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
MS 30	Trilogy Acetabular Shell	451	3,775.9	9	0.24	0.10	0.44
MS 30	ZCA All Poly Acetabular Cup	122	1,113.4	2	0.18	0.02	0.65
Omnifit Femoral Stem	Trident PSL Acetabular Shell	170	2798.5	16	0.57	0.33	0.93
Optimys Femoral Stem	RM Pressfit Acetabular Cup	1,515	3348.2	21	0.63	0.39	0.96
PLS Monolithic Cementless Femoral Stem	Delta-TT Acetabular Cup	53	394.5	2	0.51	0.06	1.83
Polarstem uncemented	R3 No Hole HA Coated Acetabulum	2,782	16,705.9	78	0.47	0.37	0.58
Polarstem uncemented	Reflection All Poly Acetabular Shell	345	3,635.5	19	0.52	0.30	0.80
Polarstem uncemented	RM Pressfit Acetabular Cup	199	833.3	6	0.72	0.26	1.57
Prodigy Femoral Stem	Duraloc Acetabulum	129	1,981.4	31	1.56	1.04	2.19
Quadra-C Cemented Femoral Stem	Mpact DM Acetabular Shell	342	1251.9	6	342	1251.9	6
Quadra-H Femoral Stem	Mpact DM Acetabular Shell	450	1656.3	18	1.09	0.64	1.72
Quadra-P Femoral Stem	Mpact DM Acetabular Shell	89	202.3	3	1.48	0.31	4.33
SL Cemented Modular Stem	Mueller PE cup	110	1,576.6	4	0.25	0.05	0.60
SL Cemented Modular Stem	RM Acetabular cup	61	1,155.5	23	1.99	1.26	2.99
SL Cemented Modular Stem	RM Acetabular Cup	259	4,227.2	22	0.52	0.32	0.77
SL Cemented Monoblock Stem	Mueller PE cup	559	6,992.2	34	0.49	0.33	0.67
Spectron Femoral Stem	Biomex acetabular shell	68	1,240.5	6	0.48	0.18	1.05
Spectron Femoral Stem	Duraloc Acetabulum	1,176	16,158.0	231	1.43	1.25	1.62
Spectron Femoral Stem	Fitmore Acetabulum	78	1,089.3	5	0.46	0.12	1.01
Spectron Femoral Stem	Mallory-Head Acetabulum	152	2,260.7	9	0.40	0.18	0.76
Spectron Femoral Stem	Morscher Acetabulum	211	3,263.8	36	1.10	0.77	1.53
Spectron Femoral Stem	Mueller PE cup	64	702.5	7	1.00	0.40	2.05
Spectron Femoral Stem	R3 No Hole HA Coated Acetabulum	462	4,287.7	16	0.37	0.21	0.61
Spectron Femoral Stem	Reflection All Poly Acetabular Shell	5,254	61,003.2	598	0.98	0.90	1.06
Spectron Femoral Stem	Reflection Porous Acetabular Shell	441	6,659.5	121	1.82	1.50	2.16
Spectron Femoral Stem	Trident PSL Acetabular Shell	77	1,086.9	8	0.74	0.29	1.45

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
S-Rom Femoral Stem	ASR Acetabular Cup	130	982.0	98	9.98	8.10	12.16
S-Rom Femoral Stem	Pinnacle Gription Acetabular Shell	409	5,623.5	43	0.76	0.55	1.03
S-Rom Femoral Stem	Ultima Acetabular Shell	78	1,606.1	15	0.93	0.52	1.54
Zimmer Standard straight stem	Mueller PE cup	631	6,654.6	24	0.36	0.23	0.53
Zimmer Standard straight stem	RM Acetabular Cup	274	3313.5	19	0.57	0.35	0.90
Zimmer Standard straight stem	Weber PE Acetabular Cup	130	1,425.3	3	0.21	0.04	0.62
Zimmer Standard straight stem	ZCA All Poly Acetabular Cup	90	890.7	3	0.34	0.07	0.98
Stemsys Cemented Femoral Stem	Delta-PF Acetabular Cup	63	322.3	0	0.00	0.00	1.14
Stemsys Cemented Lateralized Femoral Stem	Delta-PF Acetabular Cup	56	351.0	0	0.00	0.00	1.05
Stemsys Cementless Collared Femoral Stem	DeltaMotion Cup	225	1,577.8	3	0.19	0.04	0.56
Stemsys Cementless Collared Femoral Stem	Delta-PF Acetabular Cup	159	895.5	3	0.34	0.07	0.98
Stemsys Cementless Collared Femoral Stem	RM Pressfit Acetabular Cup	151	886.3	1	0.11	0.00	0.63
Stemsys Cementless Collared Femoral Stem	Zimmer Maxera Cup	187	628.0	0	0.00	0.00	0.59
Stemsys Cementless Femoral Stem	Agilis Ti-por Acetabular Cup	444	3649.5	20	0.55	0.33	0.85
Stemsys Cementless Femoral Stem	DeltaMotion Cup	116	1,334.0	3	0.22	0.05	0.66
Stemsys Cementless Femoral Stem	Fixa Ti Por Acetabular Cup	666	4,914.1	22	0.45	0.28	0.68
Stemsys Cementless Femoral Stem	Polymax Acetabular Shell	116	654.7	5	0.76	0.21	1.67
Stemsys Cementless Femoral Stem	RM Pressfit Acetabular Cup	116	1,073.4	4	0.37	0.10	0.95
Stemsys Cementless Lateralized Collared Femoral Stem	Delta-PF Acetabular Cup	347	2,136.2	9	0.42	0.19	0.80
Stemsys Cementless Lateralized Collared Femoral Stem	RM Pressfit Acetabular Cup	72	470.2	1	0.21	0.01	1.19
Stemsys Cementless Lateralized Femoral Stem	Agilis Ti-por Acetabular Cup	100	843.4	3	0.36	0.07	1.04
Stemsys Cementless Lateralized Femoral Stem	Delta-PF Acetabular Cup	91	940.5	4	0.43	0.09	1.09
Stemsys Cementless Lateralized Femoral Stem	Fixa Ti Por Acetabular Cup	362	2,755.4	13	0.47	0.24	0.78
Stemsys Cementless Lateralized Femoral Stem	Polymax Acetabular Shell	87	540.2	0	0.00	0.00	0.68
Stemsys Cementless Lateralized Femoral Stem	RM Pressfit Acetabular Cup	60	527.3	2	0.38	0.05	1.37

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Summit Femoral Stem	ASR Acetabular Cup	88	983.6	41	4.17	2.99	5.65
Summit Femoral Stem	Duraloc Acetabulum	101	1,651.3	6	0.36	0.13	0.79
Summit Femoral Stem	Pinnacle Gription Acetabular Shell	3,360	28,208.8	164	0.58	0.50	0.68
Summit Femoral Stem	Trilogy Acetabular Shell	236	2275.1	8	0.35	0.14	0.66
Synergy Porous Femoral Component	BHR Acetabular Cup	115	1404.0	47	3.35	2.43	4.41
Synergy Porous Femoral Component	Continuum TM Acetabulum	57	472.4	0	0.00	0.00	0.78
Synergy Porous Femoral Component	Delta-PF Acetabular Cup	118	1390.9	4	0.29	0.08	0.74
Synergy Porous Femoral Component	G7 Acetabular Shell	91	271.8	0	0.00	0.00	1.36
Synergy Porous Femoral Component	R3 No Hole HA Coated Acetabulum	1,868	17,464.9	76	0.44	0.34	0.54
Synergy Porous Femoral Component	Reflection All Poly Acetabular Shell	1274	180,31.0	68	0.38	0.29	0.47
Synergy Porous Femoral Component	RM Pressfit Acetabular Cup	50	317.7	1	0.31	0.00	1.75
Taperloc Complete Femoral Stem	Continuum TM Acetabulum	293	1516.4	8	0.53	0.23	1.04
Taperloc Complete Femoral Stem	Delta-PF Acetabular Cup	51	62.1	0	0.00	0.00	5.94
Taperloc Complete Femoral Stem	Delta-TT Acetabular Cup	191	848.0	3	0.35	0.07	1.03
Taperloc Complete Femoral Stem	G7 Acetabular Shell	636	2,929.8	16	0.55	0.31	0.89
Taperloc Complete Femoral Stem	G7 Osseo Ti Acetabular Shell	518	990.9	20	2.02	1.23	3.12
Taperloc Complete Femoral Stem	RM Pressfit Acetabular Cup	577	2,476.6	18	0.73	0.42	1.12
Taperloc Complete Femoral Stem	Trident Acetabular Shell	165	564.8	2	0.35	0.04	1.28
Trabecular Metal Stem	Continuum TM Acetabulum	537	4,873.9	24	0.49	0.31	0.72
Trabecular Metal Stem	Monoblock Acetabular Cup	74	1,222.7	3	0.25	0.05	0.72
Tri-Lock BPS Femoral Stem	Pinnacle Gription Acetabular Shell	237	1,159.8	5	0.43	0.14	1.01
TwinSys Cemented Lateral Stem	CCB Low Profile Cup PE	177	1,379.7	12	0.87	0.45	1.52
TwinSys Cemented Lateral Stem	Continuum TM Acetabulum	66	409.3	1	0.24	0.01	1.36
TwinSys Cemented Lateral Stem	Pinnacle Gription Acetabular Shell	71	341.6	5	1.46	0.48	3.42
TwinSys Cemented Lateral Stem	RM Acetabular Cup	141	1,863.7	9	0.48	0.22	0.92
TwinSys Cemented Lateral Stem	RM Pressfit Acetabular Cup	1503	9,525.5	43	0.45	0.32	0.60

Femur Prosthesis	Acetabular Prosthesis	N	Observed comp. Yrs.	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
TwinSys Cemented Standard Stem	CCB Low Profile Cup PE	288	2,,120.9	15	0.71	0.38	1.14
TwinSys Cemented Standard Stem	Continuum TM Acetabulum	98	752.8	3	0.40	0.06	1.06
TwinSys Cemented Standard Stem	Pinnacle Gription Acetabular Shell	110	640.3	6	0.94	0.34	2.04
TwinSys Cemented Standard Stem	RM Pressfit Acetabular Cup	1634	10165.3	28	0.28	0.18	0.40
TwinSys Cemented Standard Stem	Selexys TPS Acetabular Shell	53	592.3	4	0.68	0.18	1.73
TwinSys Uncemented Lateral Stem	Continuum TM Acetabulum	58	655.0	2	0.31	0.04	1.10
TwinSys Uncemented Lateral Stem	Delta-PF Acetabular Cup	320	4,255.8	12	0.28	0.15	0.49
TwinSys Uncemented Lateral Stem	RM Acetabular Cup	74	896.9	7	0.78	0.28	1.53
TwinSys Uncemented Lateral Stem	RM Pressfit Acetabular Cup	2526	21,955.1	133	0.61	0.51	0.72
TwinSys Uncemented Lateral Stem	Selexys TPS Acetabular Shell	523	6,873.5	69	1.00	0.78	1.27
TwinSys Uncemented Lateral Stem	Trilogy Acetabular Shell	77	1,003.1	6	0.60	0.19	1.23
TwinSys Uncemented Standard Stem	Continuum TM Acetabulum	78	842.8	3	0.36	0.07	1.04
TwinSys Uncemented Standard Stem	Delta-PF Acetabular Cup	70	816.6	3	0.37	0.08	1.07
TwinSys Uncemented Standard Stem	RM Pressfit Acetabular Cup	3027	28,630.5	191	0.67	0.58	0.77
TwinSys Uncemented Standard Stem	Selexys TPS Acetabular Shell	697	9,120.4	101	1.11	0.90	1.34
TwinSys Uncemented Standard Stem	Trilogy Acetabular Shell	132	1,756.0	8	0.46	0.20	0.90
TwinSys Uncemented XS Stem	RM Pressfit Acetabular Cup	115	1,079.0	3	0.28	0.06	0.81
Versys Cemented Femoral Stem	Trilogy Acetabular Shell	252	3,365.9	9	0.27	0.12	0.51
Versys Cemented Femoral Stem	ZCA All Poly Acetabular Cup	418	5,,111.3	35	0.68	0.47	0.94
Versys Fiber Metal Collared Stem	Trilogy Acetabular Shell	149	2814.5	12	0.43	0.22	0.74
Versys Fiber Metal Taper	Trilogy Acetabular Shell	93	1530.0	7	0.46	0.18	0.94
Wagner cone stem	Continuum TM Acetabulum	78	492.0	2	0.41	0.05	1.47
Wagner cone stem	Fitmore Acetabulum	79	1201.9	5	0.42	0.11	0.91

TABLE 1.59

All Matches > 50 procedures sorted by Revision Rate

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
S-Rom Femoral Stem	ASR Acetabular Cup	130	982.0	98	9.98	8.10	12.16	0
Anthology Porous Femoral Stem	BHR Acetabular Cup	94	945.4	62	6.56	5.03	8.41	0
Corail Cementless Femoral Stem	ASR Acetabular Cup	155	1541.8	88	5.71	4.55	7.00	0
Anthology Porous Femoral Stem	R3 No Hole HA Coated Acetabulum	68	660.1	37	5.61	3.95	7.73	0
C-Stem AMT Femoral Component	G7 Osseo Ti Acetabular Shell	153	147.9	8	5.41	2.12	10.21	87
Summit Femoral Stem	ASR Acetabular Cup	88	983.6	41	4.17	2.99	5.65	0
AMI Stem-P	Impact Acetabular Shell	56	24.5	1	4.08	0.10	22.73	56
CLS Spotorno Stem	Artek Acetabular Cup	59	848.6	29	3.42	2.24	4.84	0
Synergy Porous Femoral Component	BHR Acetabular Cup	115	1404.0	47	3.35	2.43	4.41	0
CLS Spotorno Stem	Durom Acetabulum	198	2613.2	76	2.91	2.27	3.62	0
ABGII Femoral Stem	Duraloc Acetabulum	274	4842.0	120	2.48	2.05	2.96	0
Taperloc Complete Femoral Stem	G7 Osseo Ti Acetabular Shell	518	990.9	20	2.02	1.23	3.12	153
SL Cemented Modular Stem	RM Acetabular cup	61	1155.5	23	1.99	1.26	2.99	0
Mueller Lateral Straight Stem	Trilogy Acetabular Shell	71	767.9	15	1.95	1.09	3.22	0
Exeter V40 Femoral Stem	Avantage Acetabular Cup	112	261.1	5	1.92	0.62	4.47	32
Echo Bi-Metric Femoral Component	G7 Osseo Ti Acetabular Shell	631	1260.4	24	1.90	1.22	2.83	163
CPT Femoral Stem	G7 Osseo Ti Acetabular Shell	122	267.6	5	1.87	0.61	4.36	28
Spectron Femoral Stem	Reflection Porous Acetabular Shell	441	6659.5	121	1.82	1.50	2.16	0
H-Max C Lateralized Cementless Stem	Delta-TT Acetabular Cup	91	385.7	7	1.81	0.73	3.74	13
CPT Femoral Stem	G7 Acetabular Shell	120	534.0	9	1.69	0.77	3.20	12
Exeter V40 Femoral Stem	G7 Osseo Ti Acetabular Shell	584	966.6	16	1.66	0.91	2.62	179
Elite Plus Femoral Component	Duraloc Acetabulum	614	8550.4	137	1.60	1.34	1.89	0
ABGII Acetabular Cup Femoral Stem	ABGII Acetabular Cup	109	1879.0	30	1.60	1.06	2.25	0
Prodigy Femoral Stem	Duraloc Acetabulum	129	1981.4	31	1.56	1.04	2.19	0
Corail Cementless Femoral Stem	Trident II Tritanium Acetabular Shell	62	193.7	3	1.55	0.32	4.53	7

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
CLS Spotorno Stem	RM Acetabular Cup	55	724.7	11	1.52	0.76	2.72	0
Quadra-P Femoral Stem	Mpact DM Acetabular Shell	89	202.3	3	1.48	0.31	4.33	17
TwinSys Cemented Lateral Stem	Pinnacle Gription Acetabular Shell	71	341.6	5	1.46	0.48	3.42	0
Spectron Femoral Stem	Duraloc Acetabulum	1176	16158.0	231	1.43	1.25	1.62	0
Accolade II Femoral Stem	RM Pressfit Acetabular Cup	333	1329.4	19	1.43	0.86	2.23	13
CBC Stem	Expansys Acetabular Shell	182	2385.4	32	1.34	0.92	1.89	0
Friendly Femoral Stem	Mueller Cup	60	375.2	5	1.33	0.43	3.11	0
AML MMA Femoral Stem	Duraloc Acetabulum	79	1364.8	18	1.32	0.78	2.08	0
ABGII Femoral Stem	RM Pressfit Acetabular Cup	91	696.5	9	1.29	0.59	2.45	0
CLS Spotorno Stem	Duraloc Acetabulum	712	11430.1	144	1.26	1.06	1.48	0
H-Max M Modular Stem	Delta-PF Acetabular Cup	71	799.3	10	1.25	0.60	2.30	0
Actis Duofix Femoral Stem	Pinnacle Gription Acetabular Shell	213	401.7	5	1.24	0.40	2.90	60
Accolade II Femoral Stem	Trident II Tritanium Acetabular Shell	1804	2759.7	34	1.23	0.85	1.72	592
Mallory-Head Press-Fit Femoral Component	M2A Acetabular Cup	103	1647.3	20	1.21	0.74	1.88	0
Exeter V40 Femoral Stem	Duraloc Acetabulum	1606	23646.1	286	1.21	1.07	1.36	0
Contemporary Femoral Stem	Contemporary Acetabulum	70	995.3	12	1.21	0.62	2.11	0
Quadra-H Femoral Stem	Mpact DM Acetabular Shell	366	1330.1	16	1.20	0.69	1.95	0
CCA Stainless Steel Femoral Stem	Contemporary Acetabulum	78	859.6	10	1.16	0.56	2.14	0
MS 30	Trident II Tritanium Acetabular Shell	109	86.4	1	1.16	0.00	5.41	73
Accolade II Femoral Stem	Continuum TM Acetabulum	356	1,324.8	15	1.13	0.63	1.87	5
TwinSys Uncemented Standard Stem	Selexys TPS Acetabular Shell	697	9,120.4	101	1.11	0.90	1.34	0
Master SL Monolithic Cementless Stem	Delta-TT Acetabular Cup	131	723.9	8	1.11	0.48	2.18	0
Spectron Femoral Stem	Morscher Acetabulum	211	3,263.8	36	1.10	0.77	1.53	0
Exeter V40 Femoral Stem	Trabecular Metal Acetabular Shell	283	1959.6	21	1.07	0.66	1.64	6
Corail Cementless Femoral Stem	Duraloc Acetabulum	464	6692.9	70	1.05	0.82	1.32	0
CLS Spotorno Stem	RM Acetabular cup	58	873.6	9	1.03	0.47	1.96	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
TwinSys Uncemented Lateral Stem	Selexys TPS Acetabular Shell	523	6873.5	69	1.00	0.78	1.27	0
Spectron Femoral Stem	Mueller PE cup	64	702.5	7	1.00	0.40	2.05	0
AML Std Femoral Stem	Duraloc Acetabulum	52	905.4	9	0.99	0.45	1.89	0
Friendly Femoral Stem	Delta-TT Acetabular Cup	69	711.2	7	0.98	0.40	2.03	0
MS 30	Duraloc Acetabulum	88	1525.7	15	0.98	0.55	1.62	0
Spectron Femoral Stem	Reflection All Poly Acetabular Shell	5254	61003.2	598	0.98	0.90	1.06	1
M/L Taper Femoral Stem	Delta-TT Acetabular Cup	64	628.1	6	0.96	0.35	2.08	0
TwinSys Cemented Standard Stem	Pinnacle Gription Acetabular Shell	110	640.3	6	0.94	0.34	2.04	0
S-Rom Femoral Stem	Ultima Acetabular Shell	78	1606.1	15	0.93	0.52	1.54	0
ABGII Femoral Stem	Trident Acetabular Shell	297	4616.2	43	0.93	0.67	1.25	0
Metafix Collared Femoral Stem	Trinity Acetabular Cluster Shell	477	536.8	5	0.93	0.30	2.17	258
CLS Spotorno Stem	Allofit Acetabular Cup	192	2704.3	25	0.92	0.60	1.36	0
Accolade II Femoral Stem	Delta-TT Acetabular Cup	103	562.5	5	0.89	0.29	2.07	0
CLS Spotorno Stem	Fitek Acetabular Shell	66	1465.3	13	0.89	0.47	1.52	0
MS 30	G7 Acetabular Shell	708	1354.6	12	0.89	0.43	1.50	224
CPCS Femoral Stem	Reflection All Poly Acetabular Shell	65	799.2	7	0.88	0.35	1.80	0
MS 30	Contemporary Acetabulum	128	1376.0	12	0.87	0.45	1.52	0
CPT Femoral Stem	Tritanium Acetabular Shell	85	1032.4	9	0.87	0.40	1.65	0
TwinSys Cemented Lateral Stem	CCB Low Profile Cup PE	177	1379.7	12	0.87	0.45	1.52	1
Metafix Collarless Femoral Stem	Trinity Acetabular Cluster Shell	144	347.6	3	0.86	0.18	2.52	25
CLS Spotorno Stem	CLS Expansion Acetabulum	1263	20032.5	172	0.86	0.74	1.00	0
CPT Femoral Stem	Fitmore Acetabulum	195	1884.1	16	0.85	0.49	1.38	0
Exeter V40 Femoral Stem	Trident II Tritanium Acetabular Shell	5260	9469.3	80	0.84	0.67	1.05	1719
Accolade Femoral Stem	Mueller PE cup	114	1432.7	12	0.84	0.43	1.46	0
Quadra-C Lateralized Cemented Femoral Stem	Mpact DM Acetabular Shell	109	361.7	3	0.83	0.17	2.42	1
CLS Spotorno Stem	CLW Anchorage Ring	118	2296.5	19	0.83	0.50	1.29	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Elite Plus Femoral Component	Charnley Acetabular Cup	343	4767.0	39	0.82	0.58	1.12	0
ABGII Femoral Stem	Delta-PF Acetabular Cup	107	1754.2	14	0.80	0.44	1.34	0
TwinSys Uncemented Lateral Stem	RM Acetabular Cup	74	896.9	7	0.78	0.28	1.53	0
CPT Femoral Stem	Trilogy Acetabular Shell	845	9172.8	71	0.77	0.60	0.97	0
MS 30	G7 Osseo Ti Acetabular Shell	185	392.0	3	0.77	0.16	2.24	39
S-Rom Femoral Stem	Pinnacle Gription Acetabular Shell	409	5623.5	43	0.76	0.55	1.03	4
C-Stem AMT Femoral Component	RM Pressfit Acetabular Cup	178	1308.0	10	0.76	0.37	1.41	8
Stemsys Cementless Femoral Stem	Polymax Acetabular Shell	116	654.7	5	0.76	0.21	1.67	2
Avenir Muller Uncemented Stem	Continuum TM Acetabulum	181	1833.5	14	0.76	0.42	1.28	0
H-Max M Modular Stem	Delta-TT Acetabular Cup	86	1062.3	8	0.75	0.33	1.48	0
Corail Cementless Femoral Stem	Fitmore Acetabulum	369	2792.1	21	0.75	0.47	1.15	0
Furlong H-AC Stem	Furlong Acetabular Cup	102	1477.2	11	0.74	0.37	1.33	0
Spectron Femoral Stem	Trident PSL Acetabular Shell	77	1086.9	8	0.74	0.29	1.45	0
C-Stem AMT Femoral Component	Duraloc Acetabulum	96	1232.9	9	0.73	0.33	1.39	0
H-Max S Std Cementless Stem	Delta-PF Acetabular Cup	132	687.2	5	0.73	0.20	1.59	18
Taperloc Complete Femoral Stem	RM Pressfit Acetabular Cup	577	2476.6	18	0.73	0.42	1.12	39
Corail Cementless Femoral Stem	Monoblock Acetabular Cup	95	1377.5	10	0.73	0.35	1.34	0
Polarstem uncemented	RM Pressfit Acetabular Cup	199	833.3	6	0.72	0.26	1.57	0
H-Max S Lateralizing Cementless Stem	Delta-PF Acetabular Cup	298	1534.1	11	0.72	0.34	1.24	38
CPT Femoral Stem	Duraloc Acetabulum	212	2803.6	20	0.71	0.44	1.10	0
Corail Cementless Femoral Stem	RM Pressfit Acetabular Cup	194	1411.5	10	0.71	0.34	1.30	7
TwinSys Cemented Standard Stem	CCB Low Profile Cup PE	288	2120.9	15	0.71	0.38	1.14	0
CLS Spotorno Stem	Trident PSL Acetabular Shell	153	2303.5	16	0.69	0.40	1.13	0
Exeter V40 Femoral Stem	Exeter Acetabular Cup	2991	36005.4	247	0.69	0.60	0.78	0
Versys Cemented Femoral Stem	ZCA All Poly Acetabular Cup	418	5111.3	35	0.68	0.47	0.94	0
Corail Cementless Femoral Stem	Trident PSL Acetabular Shell	111	1026.6	7	0.68	0.27	1.40	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
H-Max S Lateralizing Cementless Stem	Delta-TT Acetabular Cup	697	4694.2	32	0.68	0.47	0.96	49
C-Stem AMT Femoral Component	Pinnacle Gription Acetabular Shell	4502	24647.3	167	0.68	0.58	0.79	481
TwinSys Cemented Standard Stem	Selexys TPS Acetabular Shell	53	592.3	4	0.68	0.18	1.73	0
Mueller Lateral Straight Stem	RM Acetabular Cup	507	6404.0	43	0.67	0.49	0.90	0
CLS Spotorno Stem	Monoblock Acetabular Cup	80	1196.9	8	0.67	0.29	1.32	0
TwinSys Uncemented Standard Stem	RM Pressfit Acetabular Cup	3027	28630.5	191	0.67	0.58	0.77	68
Avenir Complete Uncemented Stem	G7 Osseo Ti Acetabular Shell	63	154.0	1	0.65	0.02	3.62	5
MS 30	Morscher Acetabulum	804	12015.7	78	0.65	0.51	0.81	0
Echo Bi-Metric Femoral Component	Continuum TM Acetabulum	215	1088.0	7	0.64	0.26	1.33	11
CPT Femoral Stem	Monoblock Acetabular Cup	84	1246.6	8	0.64	0.28	1.26	0
CLS Spotorno Stem	RM Pressfit Acetabular Cup	696	7032.6	45	0.64	0.47	0.86	5
Exeter V40 Femoral Stem	Osteolock Acetabulum	1103	16646.8	105	0.63	0.51	0.76	0
CBC Stem	RM Pressfit Acetabular Cup	443	4777.7	30	0.63	0.42	0.88	0
Optimys Femoral Stem	RM Pressfit Acetabular Cup	1515	3348.2	21	0.63	0.39	0.96	517
Charnley Acetabular Cup Femoral Stem	Charnley Acetabular Cup	804	11050.5	69	0.62	0.49	0.79	0
Accolade II Femoral Stem	Fitmore Acetabulum	144	645.1	4	0.62	0.17	1.59	0
Mueller Lateral Straight Stem	Continuum TM Acetabulum	78	806.8	5	0.62	0.17	1.36	0
ABGII Femoral Stem	Pinnacle Gription Acetabular Shell	67	974.6	6	0.62	0.23	1.34	0
Quadra-H Lateralized Femoral Stem	Mpact DM Acetabular Shell	84	326.2	2	0.61	0.07	2.22	0
CPT Femoral Stem	ZCA All Poly Acetabular Cup	645	7225.3	44	0.61	0.44	0.82	0
Exeter V40 Femoral Stem	Contemporary Acetabulum	8193	87560.1	533	0.61	0.56	0.66	2
TwinSys Uncemented Lateral Stem	RM Pressfit Acetabular Cup	2526	21955.1	133	0.61	0.51	0.72	81
H-Max S Std Cementless Stem	Delta-TT Acetabular Cup	571	3502.9	21	0.60	0.37	0.92	47
C-Stem AMT Femoral Component	Marathon Acetabular Cup	459	3670.9	22	0.60	0.38	0.91	1
TwinSys Uncemented Lateral Stem	Trilogy Acetabular Shell	77	1003.1	6	0.60	0.19	1.23	0
CPT Femoral Stem	Continuum TM Acetabulum	2049	14253.0	85	0.60	0.48	0.74	79

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
CLS Spotorno Stem	Tritanium Acetabular Shell	89	841.4	5	0.59	0.16	1.30	0
Accolade II Femoral Stem	Tritanium Acetabular Shell	1580	10119.9	60	0.59	0.45	0.76	0
Exeter V40 Femoral Stem	Delta-TT Acetabular Cup	458	2541.5	15	0.59	0.32	0.95	47
H-Max C Std Cementless Stem	Delta-TT Acetabular Cup	87	340.6	2	0.59	0.07	2.12	12
CPT Femoral Stem	Delta-TT Acetabular Cup	143	852.8	5	0.59	0.19	1.37	0
Summit Femoral Stem	Pinnacle Gription Acetabular Shell	3360	28208.8	164	0.58	0.50	0.68	202
CCA Stainless Steel Femoral Stem	CCB	91	862.2	5	0.58	0.16	1.27	0
CPT Femoral Stem	Trident PSL Acetabular Shell	144	2248.3	13	0.58	0.29	0.96	0
Exeter V40 Femoral Stem	Continuum TM Acetabulum	3202	25146.3	144	0.57	0.48	0.67	22
Omnifit Femoral Stem	Trident PSL Acetabular Shell	170	2798.5	16	0.57	0.33	0.93	0
Mueller Lateral Straight Stem	Mueller PE cup	766	8193.3	46	0.56	0.41	0.75	0
Exeter V40 Femoral Stem	Bio-clad poly Acetabular Cup	252	2680.9	15	0.56	0.31	0.92	0
CCA Stainless Steel Femoral Stem	CCB Low Profile Cup PE	688	6465.0	36	0.56	0.38	0.76	0
CBC Stem	Fitmore Acetabulum	59	909.1	5	0.55	0.18	1.28	0
Corail Cementless Femoral Stem	Pinnacle Gription Acetabular Shell	20093	129484.4	712	0.55	0.51	0.59	1719
Stemsys Cementless Femoral Stem	Agilis Ti-por Acetabular Cup	444	3649.5	20	0.55	0.33	0.85	0
Taperloc Complete Femoral Stem	G7 Acetabular Shell	636	2929.8	16	0.55	0.31	0.89	62
CLS Spotorno Stem	Trilogy Acetabular Shell	785	7818.9	42	0.54	0.38	0.72	1
Standard straight stem	RM Acetabular Cup	116	1496.3	8	0.53	0.23	1.05	0
Taperloc Complete Femoral Stem	Continuum TM Acetabulum	293	1516.4	8	0.53	0.23	1.04	4
CLS Spotorno Stem	Reflection All Poly Acetabular Shell	408	4959.3	26	0.52	0.33	0.76	0
Polarstem uncemented	Reflection All Poly Acetabular Shell	345	3635.5	19	0.52	0.30	0.80	0
CCA Stainless Steel Femoral Stem	RM Pressfit Acetabular Cup	139	1533.8	8	0.52	0.23	1.03	4
Echo Bi-Metric Femoral Component	G7 Acetabular Shell	1282	5756.1	30	0.52	0.35	0.74	131
SL Cemented Modular Stem	RM Acetabular Cup	259	4227.2	22	0.52	0.32	0.77	0
Accolade II Femoral Stem	G7 Osseo Ti Acetabular Shell	205	192.3	1	0.52	0.00	2.43	110

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Elite Plus Femoral Component	Elite Plus Ogee	109	1166.7	6	0.51	0.19	1.12	0
Elite Plus Femoral Component	Elite Plus LPW	283	3523.0	18	0.51	0.30	0.81	0
PLS Monolithic Cementless Femoral Stem	Delta-TT Acetabular Cup	53	394.5	2	0.51	0.06	1.83	0
MS 30	RM Pressfit Acetabular Cup	90	989.5	5	0.51	0.14	1.11	0
CLS Spotorno Stem	Fitmore Acetabulum	2451	35275.4	174	0.49	0.42	0.57	0
Trabecular Metal Stem	Continuum TM Acetabulum	537	4873.9	24	0.49	0.31	0.72	0
CLS Spotorno Stem	Morscher Acetabulum	1700	30473.6	150	0.49	0.42	0.58	0
Exeter V40 Femoral Stem	Mueller PE cup	222	2878.0	14	0.49	0.27	0.82	0
SL Cemented Monoblock Stem	Mueller PE cup	559	6992.2	34	0.49	0.33	0.67	0
Spectron Femoral Stem	Biomex acetabular shell	68	1240.5	6	0.48	0.18	1.05	0
TwinSys Cemented Lateral Stem	RM Acetabular Cup	141	1863.7	9	0.48	0.22	0.92	0
Mueller Lateral Straight Stem	Continuum TM Acetabulum	1047	9972.5	48	0.48	0.35	0.63	0
Corail Cementless Femoral Stem	Continuum TM Acetabulum	340	2919.0	14	0.48	0.25	0.78	0
CLS Spotorno Stem	Continuum TM Acetabulum	1191	8346.5	40	0.48	0.34	0.65	51
Exeter V40 Femoral Stem	Morscher Acetabulum	1208	19617.2	93	0.47	0.38	0.58	0
Mueller Lateral Straight Stem	Trilogy Acetabular Shell	220	2964.2	14	0.47	0.26	0.79	0
Stemsys Cementless Lateralized Femoral Stem	Fixa Ti Por Acetabular Cup	362	2755.4	13	0.47	0.24	0.78	13
Polarstem uncemented	R3 No Hole HA Coated Acetabulum	2782	16705.9	78	0.47	0.37	0.58	195
Accolade II Femoral Stem	Trident Acetabular Shell	1723	10184.4	47	0.46	0.34	0.61	8
Spectron Femoral Stem	Fitmore Acetabulum	78	1089.3	5	0.46	0.12	1.01	0
Versys Fiber Metal Taper	Trilogy Acetabular Shell	93	1530.0	7	0.46	0.18	0.94	0
TwinSys Uncemented Standard Stem	Trilogy Acetabular Shell	132	1756.0	8	0.46	0.20	0.90	0
Exeter V40 Femoral Stem	Tritanium Acetabular Shell	3927	30246.6	137	0.45	0.38	0.54	0
TwinSys Cemented Lateral Stem	RM Pressfit Acetabular Cup	1503	9525.5	43	0.45	0.32	0.60	135
Exeter V40 Femoral Stem	R3 No Hole HA Coated Acetabulum	1054	6247.6	28	0.45	0.30	0.65	76
Stemsys Cementless Femoral Stem	Fixa Ti Por Acetabular Cup	666	4914.1	22	0.45	0.28	0.68	33

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
CLS Spotorno Stem	Trabecular Metal Acetabular Shell	59	673.9	3	0.45	0.09	1.30	0
Exeter V40 Femoral Stem	CLS Expansion Acetabulum	217	2935.2	13	0.44	0.24	0.76	0
Exeter V40 Femoral Stem	Exeter X3 Rimfit Acetabular Cup	3436	21453.1	95	0.44	0.36	0.54	139
Exeter V40 Femoral Stem	CCB Low Profile Cup PE	601	4997.4	22	0.44	0.28	0.67	9
Corail Cementless Femoral Stem	G7 Acetabular Shell	156	685.7	3	0.44	0.09	1.28	12
Synergy Porous Femoral Component	R3 No Hole HA Coated Acetabulum	1868	17464.9	76	0.44	0.34	0.54	13
Tri-Lock BPS Femoral Stem	Pinnacle Gription Acetabular Shell	237	1159.8	5	0.43	0.14	1.01	40
Versys Fiber Metal Collared Stem	Trilogy Acetabular Shell	149	2814.5	12	0.43	0.22	0.74	0
Stemsys Cementless Lateralized Femoral Stem	Delta-PF Acetabular Cup	91	940.5	4	0.43	0.09	1.09	0
Stemsys Cementless Lateralized Collared Femoral Stem	Delta-PF Acetabular Cup	347	2136.2	9	0.42	0.19	0.80	0
Mueller Lateral Straight Stem	Mpact DM Acetabular Shell	183	238.0	1	0.42	0.01	2.34	61
Wagner cone stem	Fitmore Acetabulum	79	1201.9	5	0.42	0.11	0.91	0
CLS Spotorno Stem	Pinnacle Gription Acetabular Shell	133	1207.9	5	0.41	0.11	0.91	0
Exeter V40 Femoral Stem	Pinnacle Gription Acetabular Shell	4213	28226.3	115	0.41	0.34	0.49	238
Wagner cone stem	Continuum TM Acetabulum	78	492.0	2	0.41	0.05	1.47	3
Accolade Femoral Stem	Trident PSL Acetabular Shell	663	10280.0	41	0.40	0.28	0.54	0
TwinSys Cemented Standard Stem	Continuum TM Acetabulum	98	752.8	3	0.40	0.06	1.06	3
Spectron Femoral Stem	Mallory-Head Acetabulum	152	2260.7	9	0.40	0.18	0.76	0
Exeter V40 Femoral Stem	Trident II Clusterhole HA Shell	366	503.3	2	0.40	0.02	1.27	135
Exeter V40 Femoral Stem	Trident Acetabular Shell	12176	95467.1	375	0.39	0.35	0.43	290
Mueller Lateral Straight Stem	RM Pressfit Acetabular Cup	173	1808.1	7	0.39	0.14	0.76	0
Exeter V40 Femoral Stem	G7 Acetabular Shell	390	1839.3	7	0.38	0.15	0.78	12
Stemsys Cementless Lateralized Femoral Stem	RM Pressfit Acetabular Cup	60	527.3	2	0.38	0.05	1.37	0
Synergy Porous Femoral Component	Reflection All Poly Acetabular Shell	1274	18031.0	68	0.38	0.29	0.47	0
Spectron Femoral Stem	R3 No Hole HA Coated Acetabulum	462	4287.7	16	0.37	0.21	0.61	4
Stemsys Cementless Femoral Stem	RM Pressfit Acetabular Cup	116	1073.4	4	0.37	0.10	0.95	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Accolade Femoral Stem	Trident Acetabular Shell	1204	18567.6	69	0.37	0.29	0.47	0
Exeter V40 Femoral Stem	Reflection All Poly Acetabular Shell	1564	15345.7	57	0.37	0.28	0.48	12
Exeter V40 Femoral Stem	Polymax Acetabular Shell	85	541.3	2	0.37	0.04	1.33	0
Exeter V40 Femoral Stem	Trident PSL Acetabular Shell	3147	34223.5	126	0.37	0.31	0.44	5
TwinSys Uncemented Standard Stem	Delta-PF Acetabular Cup	70	816.6	3	0.37	0.08	1.07	2
MS 30	Pinnacle Gription Acetabular Shell	369	1100.3	4	0.36	0.08	0.86	65
Summit Femoral Stem	Duraloc Acetabulum	101	1651.3	6	0.36	0.13	0.79	0
Standard straight stem	Mueller PE cup	631	6654.6	24	0.36	0.23	0.53	0
CPCS Femoral Stem	R3 No Hole HA Coated Acetabulum	427	2510.9	9	0.36	0.16	0.68	30
Exeter V40 Femoral Stem	Trilogy Acetabular Shell	3861	37315.9	133	0.36	0.30	0.42	119
TwinSys Uncemented Standard Stem	Continuum TM Acetabulum	78	842.8	3	0.36	0.07	1.04	0
Stemsys Cementless Lateralized Femoral Stem	Agilis Ti-por Acetabular Cup	100	843.4	3	0.36	0.07	1.04	0
Taperloc Complete Femoral Stem	Trident Acetabular Shell	165	564.8	2	0.35	0.04	1.28	0
Taperloc Complete Femoral Stem	Delta-TT Acetabular Cup	191	848.0	3	0.35	0.07	1.03	0
Summit Femoral Stem	Trilogy Acetabular Shell	236	2275.1	8	0.35	0.14	0.66	20
Avenir Muller Uncemented Stem	Fitmore Acetabulum	70	579.2	2	0.35	0.04	1.25	0
Exeter V40 Femoral Stem	RM Pressfit Acetabular Cup	3474	25749.8	88	0.34	0.27	0.42	90
MS 30	Continuum TM Acetabulum	612	4102.8	14	0.34	0.18	0.56	63
MS 30	Mueller PE cup	502	5301.6	18	0.34	0.20	0.54	1
Lateral straight stem	Weber PE Acetabular Cup	284	3258.4	11	0.34	0.17	0.60	0
Quadra-C Cemented Femoral Stem	Mpact DM Acetabular Shell	233	890.2	3	0.34	0.05	0.90	0
Standard straight stem	ZCA All Poly Acetabular Cup	90	890.7	3	0.34	0.07	0.98	0
Avenir Muller Uncemented Stem	RM Acetabular Cup	79	893.2	3	0.34	0.07	0.98	0
Stemsys Cementless Collared Femoral Stem	Delta-PF Acetabular Cup	159	895.5	3	0.34	0.07	0.98	2
Corail Cementless Femoral Stem	Trilogy Acetabular Shell	283	2161.1	7	0.32	0.13	0.67	20
Exeter V40 Femoral Stem	Monoblock Acetabular Cup	136	2214.7	7	0.32	0.13	0.65	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Synergy Porous Femoral Component	RM Pressfit Acetabular Cup	50	317.7	1	0.31	0.00	1.75	3
Corail Cementless Femoral Stem	DeltaMotion Cup	78	967.5	3	0.31	0.04	0.83	0
TwinSys Uncemented Lateral Stem	Continuum TM Acetabulum	58	655.0	2	0.31	0.04	1.10	0
Basis Primary Femoral Stem	Reflection All Poly Acetabular Shell	130	1317.3	4	0.30	0.08	0.78	0
Avenir Muller Uncemented Stem	Pinnacle Gription Acetabular Shell	99	1322.2	4	0.30	0.08	0.77	0
Corail Cementless Femoral Stem	Ultima Acetabular Shell	134	1339.3	4	0.30	0.08	0.76	0
Corail Cementless Femoral Stem	Reflection All Poly Acetabular Shell	158	2077.3	6	0.29	0.11	0.63	0
MS 30	Fitmore Acetabulum	2891	26339.5	76	0.29	0.23	0.36	0
Synergy Porous Femoral Component	Delta-PF Acetabular Cup	118	1390.9	4	0.29	0.08	0.74	0
Avenir Muller Uncemented Stem	Tritanium Acetabular Shell	91	1053.9	3	0.28	0.06	0.83	0
TwinSys Uncemented Lateral Stem	Delta-PF Acetabular Cup	320	4255.8	12	0.28	0.15	0.49	0
C-Stem AMT Femoral Component	Elite Plus Ogee	67	709.5	2	0.28	0.03	1.02	0
CPT Femoral Stem	Pinnacle Gription Acetabular Shell	67	709.5	2	0.28	0.02	0.90	1
TwinSys Uncemented XS Stem	RM Pressfit Acetabular Cup	115	1079.0	3	0.28	0.06	0.81	3
M/L Taper Femoral Stem	Trident Acetabular Shell	328	2532.2	7	0.28	0.11	0.57	0
Friendly Femoral Stem	Delta-PF Acetabular Cup	179	2538.0	7	0.28	0.11	0.57	4
TwinSys Cemented Standard Stem	RM Pressfit Acetabular Cup	1634	10165.3	28	0.28	0.18	0.40	208
Accolade Femoral Stem	Tritanium Acetabular Shell	152	1842.6	5	0.27	0.07	0.59	0
Versys Cemented Femoral Stem	Trilogy Acetabular Shell	252	3365.9	9	0.27	0.12	0.51	0
AMI Stem-C	Mpact DM Acetabular Shell	269	374.4	1	0.27	0.00	1.25	88
SL Cemented Modular Stem	Mueller PE cup	110	1576.6	4	0.25	0.05	0.60	0
Exeter V40 Femoral Stem	PolarCup cemented	115	394.2	1	0.25	0.01	1.41	22
Trabecular Metal Stem	Monoblock Acetabular Cup	74	1222.7	3	0.25	0.05	0.72	0
TwinSys Cemented Lateral Stem	Continuum TM Acetabulum	66	409.3	1	0.24	0.01	1.36	1
MS 30	Trilogy Acetabular Shell	451	3775.9	9	0.24	0.10	0.44	1
Avenir Muller Uncemented Stem	RM Pressfit Acetabular Cup	53	423.4	1	0.24	0.01	1.32	0

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Corail Cementless Femoral Stem	Delta-PF Acetabular Cup	83	1290.6	3	0.23	0.05	0.68	1
Exeter V40 Femoral Stem	ZCA All Poly Acetabular Cup	217	1730.5	4	0.23	0.06	0.59	0
Corail Cementless Femoral Stem	Tritanium Acetabular Shell	175	1764.2	4	0.23	0.06	0.58	0
Stemsys Cementless Femoral Stem	DeltaMotion Cup	116	1334.0	3	0.22	0.05	0.66	0
Stemsys Cementless Lateralized Collared Femoral Stem	RM Pressfit Acetabular Cup	72	470.2	1	0.21	0.01	1.19	0
Mueller Lateral Straight Stem	Weber PE Acetabular Cup	130	1425.3	3	0.21	0.04	0.62	0
Exeter V40 Femoral Stem	Weber PE Acetabular Cup	72	961.3	2	0.21	0.03	0.75	0
FTC Femoral Stem	DeltaMotion Cup	100	1442.5	3	0.21	0.04	0.61	0
Stemsys Cementless Collared Femoral Stem	DeltaMotion Cup	225	1577.8	3	0.19	0.04	0.56	0
MS 30	ZCA All Poly Acetabular Cup	122	1113.4	2	0.18	0.02	0.65	0
Accolade Femoral Stem	Pinnacle Gription Acetabular Shell	180	2384.3	4	0.17	0.05	0.43	0
Echo Bi-Metric Femoral Component	Exceed ABT Ringloc-X Acetabulum	57	625.4	1	0.16	0.00	0.89	0
Exeter V40 Femoral Stem	Fitmore Acetabulum	1248	11287.2	18	0.16	0.09	0.25	0
Mueller Lateral Straight Stem	RM Pressfit Acetabular Cup	137	1433.4	2	0.14	0.02	0.50	0
Stemsys Cementless Collared Femoral Stem	RM Pressfit Acetabular Cup	151	886.3	1	0.11	0.00	0.63	0
Mueller Lateral Straight Stem	ZCA All Poly Acetabular Cup	164	1660.0	1	0.06	0.00	0.34	0
AMI Stem-C	Impact Acetabular Shell	62	35.6	0	0.00	0.00	10.38	62
AMI Stem-P	Mpact DM Acetabular Shell	184	315.8	0	0.00	0.00	1.17	27
Corail Cemented Femoral Stem	Pinnacle Gription Acetabular Shell	82	64.5	0	0.00	0.00	5.72	51
Corin Paragon Cementless Femoral Stem	Trinity Acetabular Cluster Shell	90	46.0	0	0.00	0.00	8.02	79
Furlong Evolution Collared Stem	Delta-PF Acetabular Cup	181	350.3	0	0.00	0.00	1.05	45
Insignia Hip Stem	Trident II Tritanium Acetabular Shell	112	69.3	0	0.00	0.00	5.32	87
Stemsys Cemented Femoral Stem	Delta-PF Acetabular Cup	63	322.3	0	0.00	0.00	1.14	1
Stemsys Cemented Lateralized Femoral Stem	Delta-PF Acetabular Cup	56	351.0	0	0.00	0.00	1.05	0
Stemsys Cementless Collared Femoral Stem	Zimmer Maxera Cup	187	628.0	0	0.00	0.00	0.59	0
Stemsys Cementless Lateralized Femoral Stem	Polymax Acetabular Shell	87	540.2	0	0.00	0.00	0.68	5

Femur Prosthesis	Acetabular Prosthesis	N	Sum comp. Yrs	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Ops 2023
Synergy Porous Femoral Component	Continuum TM Acetabulum	57	472.4	0	0.00	0.00	0.78	0
Synergy Porous Femoral Component	G7 Acetabular Shell	91	271.8	0	0.00	0.00	1.36	20
Taperloc Complete Femoral Stem	Delta-PF Acetabular Cup	51	62.1	0	0.00	0.00	5.94	28

TABLE 1.60

Top 30 Matches

Femur: Acetabular Prosthesis	No. Ops.	Observed comp. Yrs.	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Procedures 2024	Procedures Pre-2024
Corail Cementless Femoral Stem: Pinnacle Gription Acetabular Shell	20093	129484.4	712	0.55	0.51	0.59	1719	18374
Exeter V40 Femoral Stem: Trident Acetabular Shell	12176	95467.1	375	0.39	0.35	0.43	290	11886
Exeter V40 Femoral Stem: Contemporary Acetabulum	8193	87560.1	533	0.61	0.56	0.66	2	8191
Exeter V40 Femoral Stem: Trident II Tritanium Acetabular Shell	5260	9469.3	80	0.84	0.67	1.05	1719	3541
Spectron Femoral Stem: Reflection All Poly Acetabular Shell	5254	61003.2	598	0.98	0.90	1.06	1	5253
C-Stem AMT Femoral Component: Pinnacle Gription Acetabular Shell	4502	24647.3	167	0.68	0.58	0.79	481	4021
Exeter V40 Femoral Stem: Pinnacle Gription Acetabular Shell	4213	28226.3	115	0.41	0.34	0.49	238	3975
Exeter V40 Femoral Stem: Tritanium Acetabular Shell	3927	30246.6	137	0.45	0.38	0.54	0	3927
Exeter V40 Femoral Stem: Trilogy Acetabular Shell	3861	37315.9	133	0.36	0.30	0.42	119	3742
Exeter V40 Femoral Stem: RM Pressfit Acetabular Cup	3474	25749.8	88	0.34	0.27	0.42	90	3384
Exeter V40 Femoral Stem: Exeter X3 Rimfit Acetabular Cup	3436	21453.1	95	0.44	0.36	0.54	139	3297
Summit Femoral Stem: Pinnacle Gription Acetabular Shell	3360	28208.8	164	0.58	0.50	0.68	202	3158
Exeter V40 Femoral Stem: Continuum TM Acetabulum	3202	25146.3	144	0.57	0.48	0.67	22	3180
Exeter V40 Femoral Stem: Trident PSL Acetabular Shell	3147	34223.5	126	0.37	0.31	0.44	5	3142
TwinSys Uncemented Standard Stem: RM Pressfit Acetabular Cup	3027	28630.5	191	0.67	0.58	0.77	68	2959
Exeter V40 Femoral Stem: Exeter Acetabular Cup	2991	36005.4	247	0.69	0.60	0.78	0	2991

Femur: Acetabular Prosthesis	No. Ops.	Observed comp. Yrs.	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI	Procedures 2024	Procedures Pre-2024
MS 30: Fitmore Acetabulum	2891	26339.5	76	0.29	0.23	0.36	0	2891
Polarstem uncemented: R3 No Hole HA Coated Acetabulum	2782	16705.9	78	0.47	0.37	0.58	195	2587
TwinSys Uncemented Lateral Stem: RM Pressfit Acetabular Cup	2526	21955.1	133	0.61	0.51	0.72	81	2445
CLS Spotorno Stem: Fitmore Acetabulum	2451	35275.4	174	0.49	0.42	0.57	0	2451
CPT Femoral Stem: Continuum TM Acetabulum	2049	14253.0	85	0.60	0.48	0.74	79	1970
Synergy Porous Femoral Component: R3 No Hole HA Coated Acetabulum	1868	17464.9	76	0.44	0.34	0.54	13	1855
Accolade II Femoral Stem: Trident II Tritanium Acetabular Shell	1804	2759.7	34	1.23	0.85	1.72	592	1212
Accolade II Femoral Stem: Trident Acetabular Shell	1723	10184.4	47	0.46	0.34	0.61	8	1715
CLS Spotorno Stem: Morscher Acetabulum	1700	30473.6	150	0.49	0.42	0.58	0	1700
TwinSys Cemented Standard Stem: RM Pressfit Acetabular Cup	1634	10165.3	28	0.28	0.18	0.40	208	1426
Exeter V40 Femoral Stem: Duraloc Acetabulum	1606	23646.1	286	1.21	1.07	1.36	0	1606
Accolade II Femoral Stem: Tritanium Acetabular Shell	1580	10119.9	60	0.59	0.45	0.76	0	1580
Exeter V40 Femoral Stem: Reflection All Poly Acetabular Shell	1564	15345.7	57	0.37	0.28	0.48	12	1552
Optimys Femoral Stem: RM Pressfit Acetabular Cup	1515	3348.2	21	0.63	0.39	0.96	517	998

TABLE 1.61

KNEE ARTHROPLASTY

62

PRIMARY KNEE ARTHROPLASTY

The **twenty-six-year** report analyses data for the period January 1999 – December 2024.

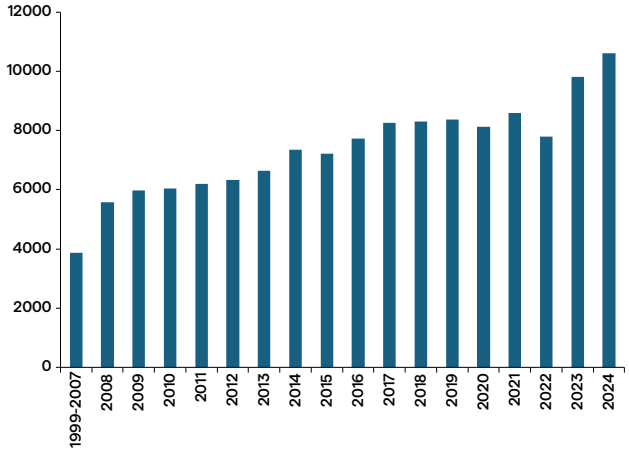
New data forms introduced in October 2020 have 3 categories of knee replacement: total knees, unicompartmental knees with medial or lateral approach, and patellofemoral knees. There were 12,312 new knee registrations in 2024.

Primary Knee Arthroplasty by Type – 1999 to 2024

Primary Knee Arthroplasty (PKA) Type	N
Total Knee Arthroplasty (TKR)	163,781
Unicompartmental Knee Arthroplasty (UKR)	19,162
Patellofemoral Knee Arthroplasty (PFJ)	1,111

TABLE 2.1

Number of operations by year



Age of Primary Knee Arthroplasty Patients by Gender

	Female				
	Mean	Minimum	Maximum	SD	N (%)
Total Knee Arthroplasty (TKR)	68.6	13.2	100.5	9.5	84,139
Unicompartmental Knee Arthroplasty (UKR)	65.9	18.3	94.7	10.1	7928
Patellofemoral Knee Arthroplasty (PFJ)	59.9	31.2	89.4	10.9	695

TABLE 2.2

	Male				
	Mean	Minimum	Maximum	SD	N (%)
Total Knee Arthroplasty (TKR)	67.9	11.6	100.0	9.1	79,642
Unicompartmental Knee Arthroplasty (UKR)	66.2	19.5	94.6	9.2	10049
Patellofemoral Knee Arthroplasty (PFJ)	61.5	31.3	90.7	10.5	281

TABLE 2.3

Ethnicity	N	%
Asian	5,073	3.4
Euro/Other	130,344	86.7
Māori	9,510	6.3
Pacifica	5,473	3.6

TABLE 2.4

Data form analysis includes new form and legacy data and is for **Total Knee Arthroplasty**.

Age Groups	N	%
<40	387	0.2
40-54	12,718	7.8
55-64	46,045	28.1
65-74	63,548	38.8
>=75	41,082	25.1

TABLE 2.5

Body Mass Index

BMI (kg/m2)	N	%
< 19	229	0.3
19 - 24	9,456	10.4
25 - 29	28,933	31.7
30 - 39	43,306	47.5
40+	9,272	10.2

TABLE 2.6

For the thirteen-year period 2010 - 2023, there were 81,057 BMI registrations for total knee replacements. The average was 31.3 with a range of 12.5 – 70.0 and a standard deviation of 5.91.

ASA Class

ASA Class	N	%
1	14,236	10.1
2	88,686	63.2
3	36,943	26.3
4	547	0.4

TABLE 2.7

Previous operation	N
None	137,261
Menisectomy	16,358
Osteotomy	2,254
Ligament reconstruction	3,159
Internal fixation	1,451
Synovectomy	235
Other	1,914

TABLE 2.8

Diagnosis	N
Osteoarthritis	155,743
Rheumatoid arthritis/Other Inflammatory	4,094
Dysplasia	2,115
Fracture	1,893
Avascular necrosis	494
Tumour	0
Other	1,996

TABLE 2.9

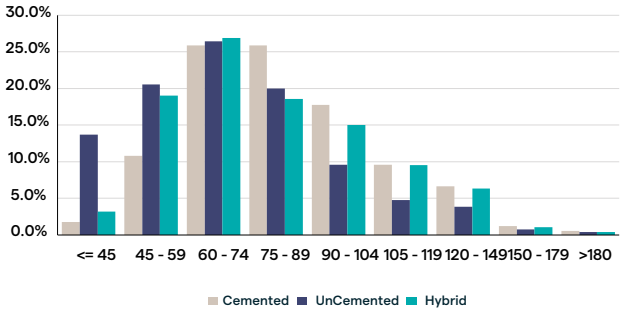
Approach	N
Media parapatellar	149,784
Lateral parapatellar	1,783
TTO	3
Other	492

TABLE 2.10

Surgical Adjuncts	N
Computer Navigation	28,240
Robotic assisted	6,366
Patient Specific Cutting Guides	767

TABLE 2.11

Operative time (skin to skin in minutes)



Surgeon grade

The updated forms introduced in 2005 have separated advanced trainees into supervised and unsupervised. The following figures are for the eighteen-year period 2005 – 2024.

Surgeon grade	N
Consultant	129,222
Advanced trainee supervised	11,400
Advanced trainee unsupervised	2,558
Basic trainee	1,928

TABLE 2.12

Surgeon and Hospital Workload

Operations per Year	N
<10	2,818
10-24	29,679
25-49	62,576
50-74	41,975
75-99	15,079
>=100	11,654

TABLE 2.12

Surgeons

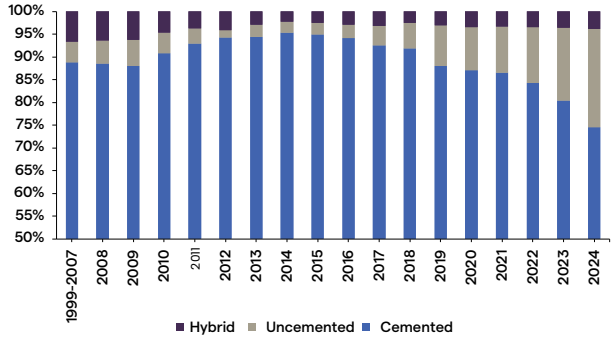
In 2024, 241 surgeons performed 10, 647 total knee replacements, an average of 44 procedures per surgeon.

29 surgeons performed less than 10 procedures and 102 performed more than 40.

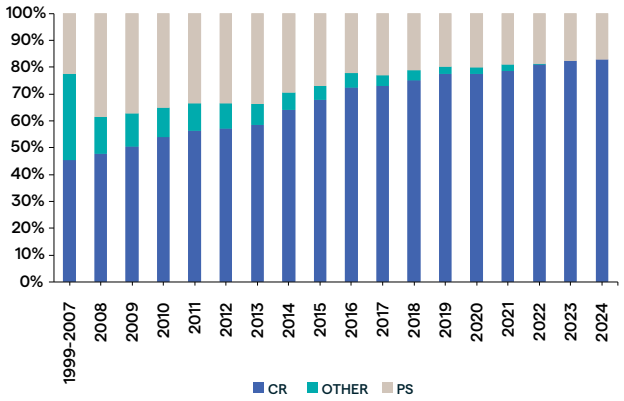
Hospitals

In 2024, total knee replacement was performed in 54 hospitals; 27 were public hospitals and 27 were private.

Cementation Rates for TKR by Year



Bearing Constraint in TKR by Year



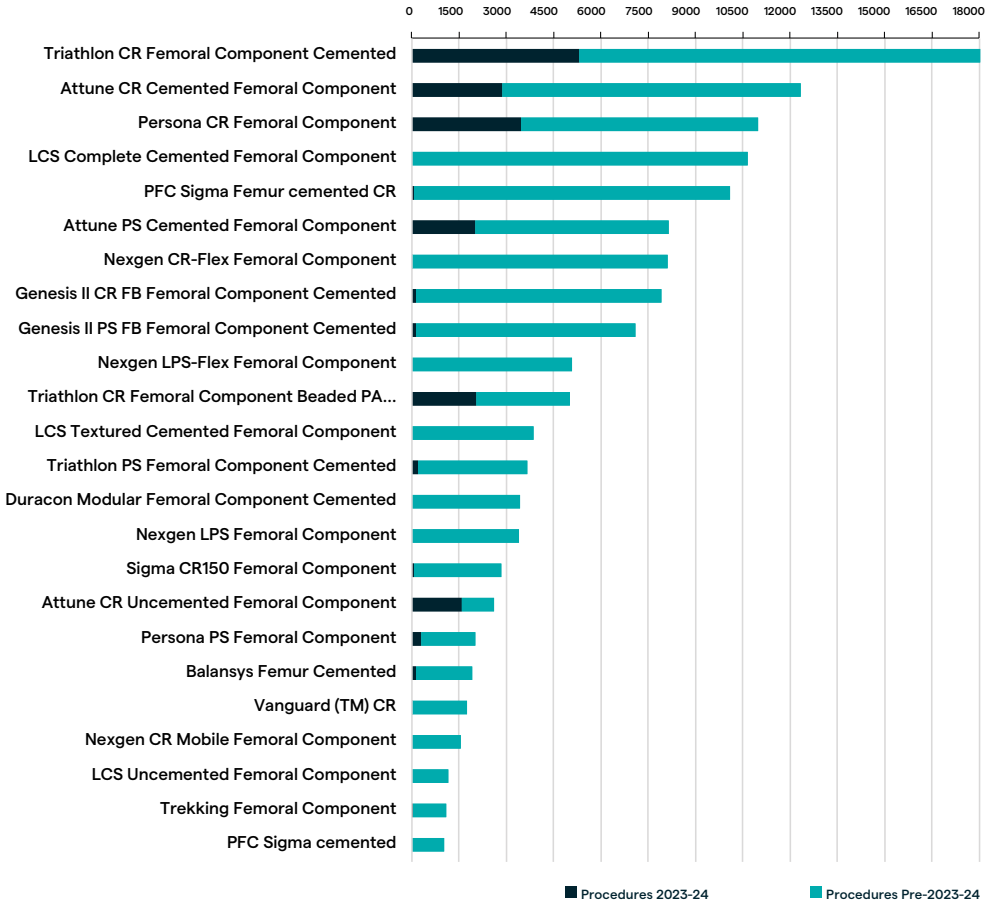
OTHER refers to minimally stabilised of which 98% are LCS.

Most Used Femoral Components 2020-2024

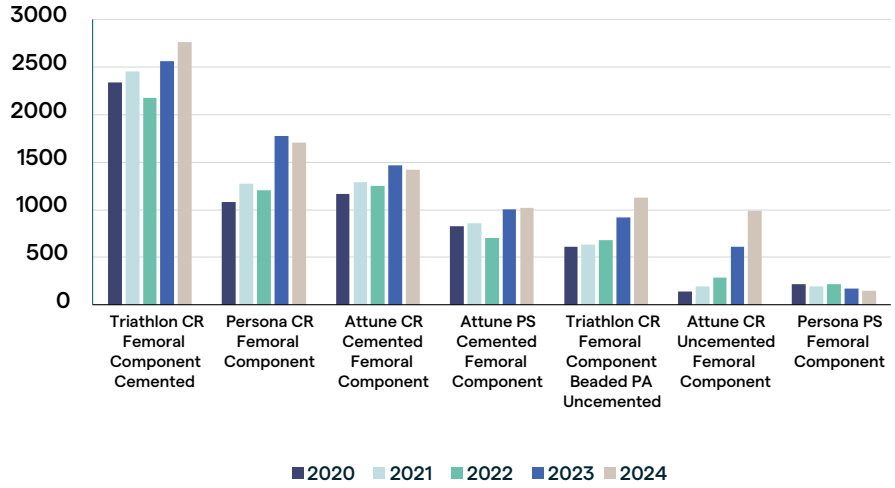
Implant Catalogue Description	2020	2021	2022	2023	2024
Triathlon CR Femoral Component Cemented	2336	2455	2180	2564	2763
Persona CR Femoral Component	1078	1272	1206	1772	1707
Attune CR Cemented Femoral Component	1165	1291	1253	1470	1421
Attune PS Cemented Femoral Component	830	857	707	1002	1019
Triathlon CR Femoral Component Beaded PA Uncemented	613	636	679	923	1125
Attune CR Uncemented Femoral Component	145	196	290	611	987
Persona PS Femoral Component	215	192	216	171	147

TABLE 2.13

The figure below summarises the 24 Knee prostheses with >1000 procedures. Showing the number of procedures for the history of the Registry and for the previous 2 years.



Most used total knee prostheses per year for five years 2020-2024



Revision Total 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 are all recorded as revisions.

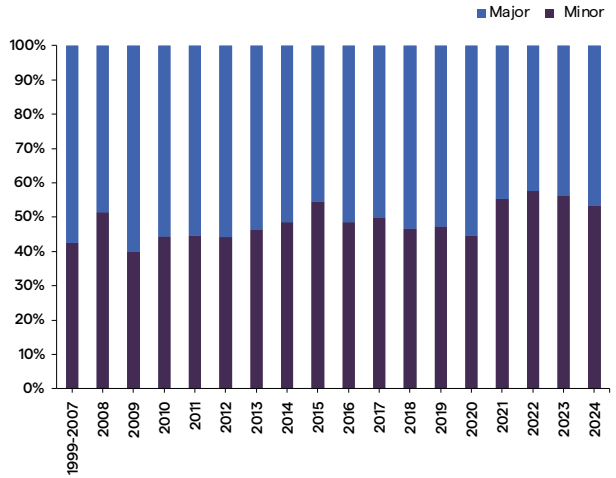
Classification of Revision Procedures

Revision Procedure	Category
Change of all components	Major
Change of femoral component	Major
Change of tibial component	Major
Change of patellar component	Minor
Change of polyethylene liner	Minor
Removal of components only	Major

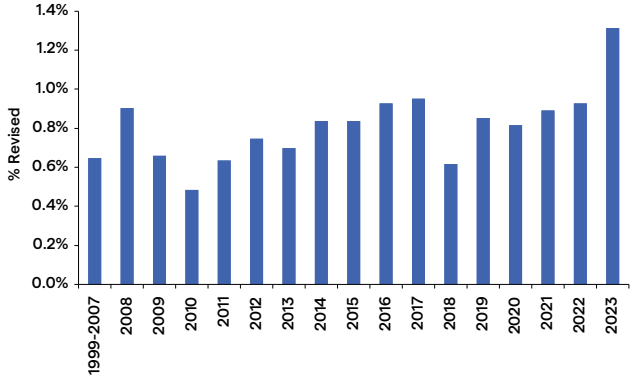
TABLE 2.14

Re-operation only: no components added, exchanged or removed.

Proportion of Minor and Major Revisions by Year



Total Knee Arthroplasties Revised within One Year



Data analysis

For the twenty-six-year period January 1999 – December 2024, there were 13,386 revision knee procedures registered. There were an additional 450 revisions over the past 12 months.

The average age for a revision knee replacement was 68.7 years, with a range of 20.7 to 96.5 years.

The following data analyses are restricted to revisions of primary registered knee arthroplasties for the twenty-five-year period. There were 6,072 revisions of the 163,871 primary total knee replacements.

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

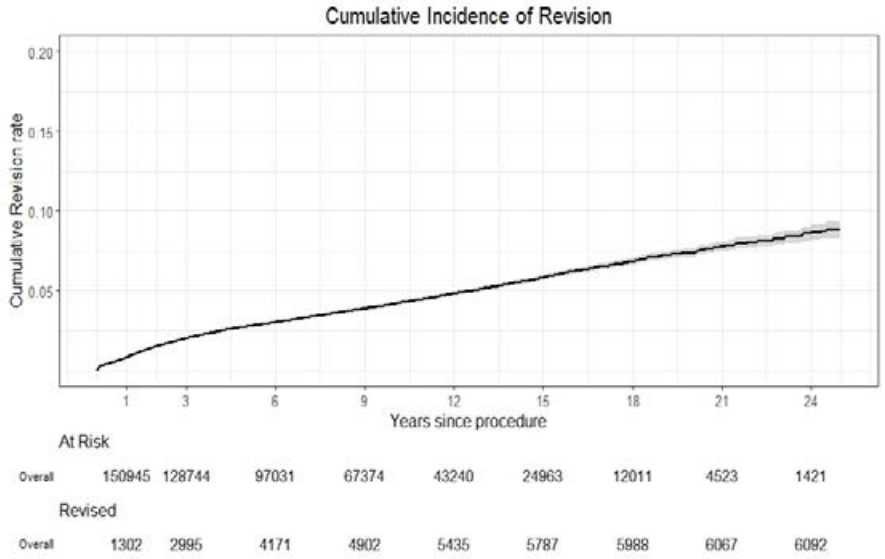
Time to revision	Years
Average	4.99
Maximum	24.7 years
Minimum	1 day

TABLE 2.15

All Primary Total Knee Arthroplasties

	N	Observed comp. years	N. Revised	Rate/100-component-years (95% CI)
All patients	163,781	1,370,904.2	6,072	0.4429 (0.43-0.45)

TABLE 2.16



Survival by Gender

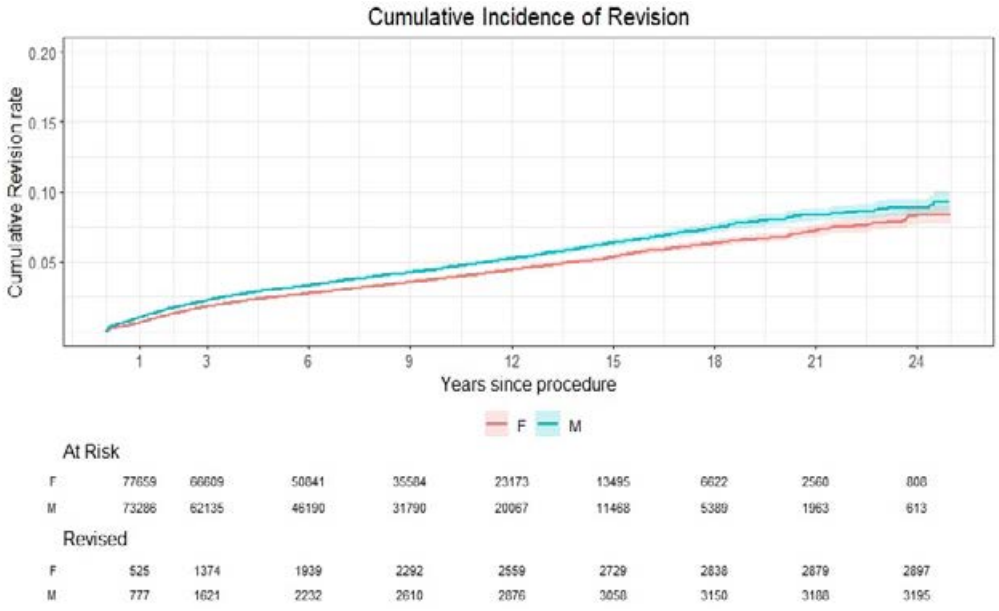
Sex	N	Observed comp. years	N. Revised	Rate/100-component-years (95% CI)
F	84,140	719,231.8	2,887	0.40 (0.39-0.42)
M	79,641	651,672.4	3,185	0.49 (0.47-0.51)

TABLE 2.17

Survival by Age Group

Age Groups	N	Observed comp. years	N Revised	Rate/100-component-years (95% CI)	Lower CI	Upper CI
<40	387	4,690.7	53	1.13	0.84	1.47
40-54	12,718	121,312.1	999	0.82	0.77	0.88
55-64	46,045	418,025.2	2,295	0.55	0.53	0.57
65-74	63,548	536,009.8	1,977	0.37	0.35	0.39
>=75	41,082	290,864.0	748	0.26	0.24	0.28

TABLE 2.18

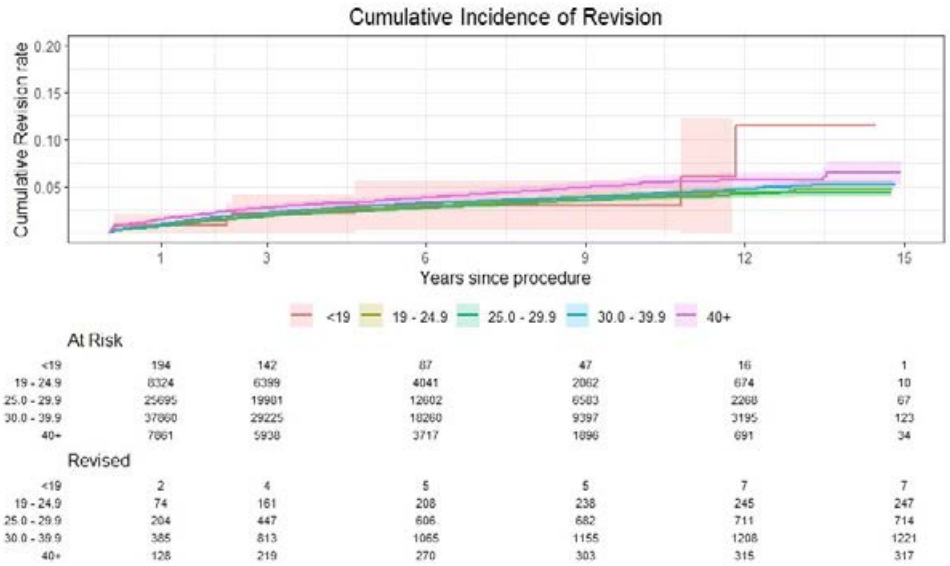


Survival by BMI

For the thirteen-year period 2010 - 2024, there were 2,770 BMI registrations for revision knee replacements. The average BMI was 31.73 kg/m^2 with a range of 15-65 and a standard deviation of 6.42.

BMI	N (%)	Observed comp. years	N Revised	Rate/100-component-years	Lower CI	Upper CI
< 19	229 (0.3)	1207.5	6	0.50	0.00	1.08
19 - 24	9,456 (10.4)	52613.8	245	0.47	0.41	0.53
25 - 29	28,933 (31.7)	165053.4	715	0.43	0.40	0.47
30 - 39	43,306 (47.5)	240391.7	1221	0.51	0.48	0.54
40+	9,272 (10.2)	49375.0	316	0.64	0.57	0.71

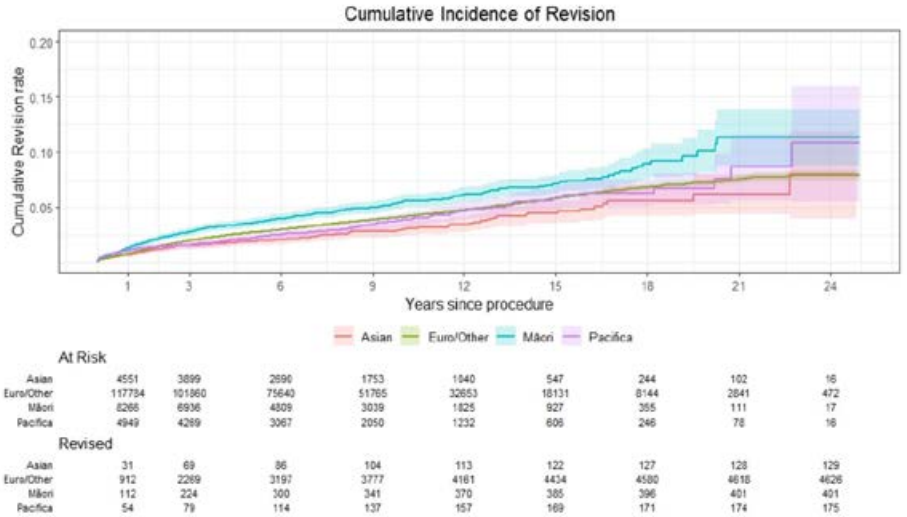
TABLE 2.19



Survival by Ethnicity

Ethnicity	N	Observed comp. years	N Revised	Rate/100-component-years	Lower CI	Upper CI
Asian	5,073	42,369.1	141	0.33	0.28	0.39
Euro/Other	130,344	115,5640.4	5121	0.44	0.43	0.46
Māori	9,510	74,475.6	443	0.59	0.54	0.65
Pacifica	5,473	46,810.4	188	0.40	0.35	0.46

TABLE 2.20



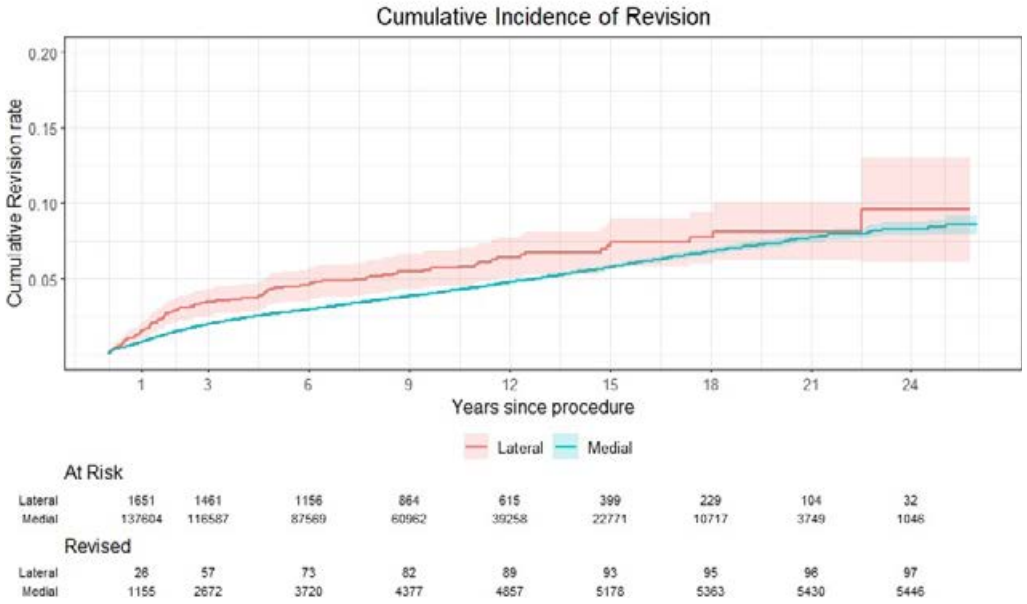
Public/Private	N	Observed comp. years	N Revised	Rate/100-component-years	Lower CI	Upper CI
Public	76,443	675,913.6	2,861	0.42	0.41	0.44
Private	87,338	694,990.7	3,211	0.46	0.45	0.48

TABLE 2.21

Survival by Approach

Approach	N	Observed comp. years	N Revised	Rate/100-component-years (95% CI)	Lower CI	Upper CI
Medial	149,784	1,240,924.4	5433	0.44	0.43	0.45
Lateral	1,783	17,044.1	94	0.55	0.44	0.67
TTO	3	9.2	0	0.00	0.00	40.00
Other	492	793.5	21	2.65	1.64	4.05

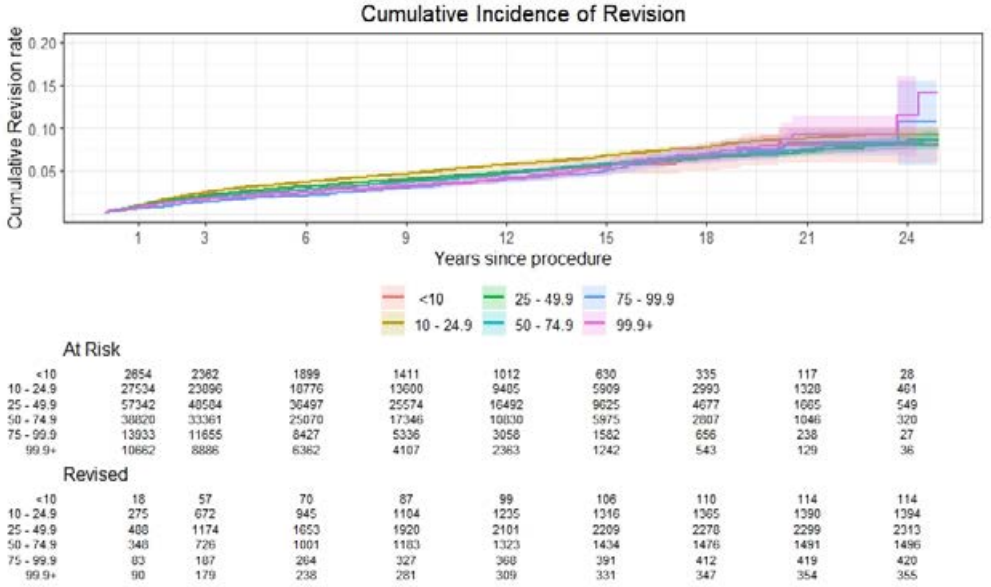
TABLE 2.22



Survival by Number of Procedures Performed per Year by Primary Surgeon

Operations per Year	N	Observed comp. years	N Revised	Rate/100-component-years	Lower CI	Upper CI
<10	2,818	27,334.5	108	0.40	0.32	0.48
10-24	29,679	271,886.0	1,392	0.51	0.49	0.54
25-49	62,576	519,940.2	2,312	0.44	0.43	0.46
50-74	41,975	349,805.9	1,487	0.43	0.40	0.45
75-99	15,079	114,349.7	417	0.36	0.33	0.40
>=100	11,654	87,587.9	356	0.41	0.36	0.45

TABLE 2.23



Survival by Bearing Constraint

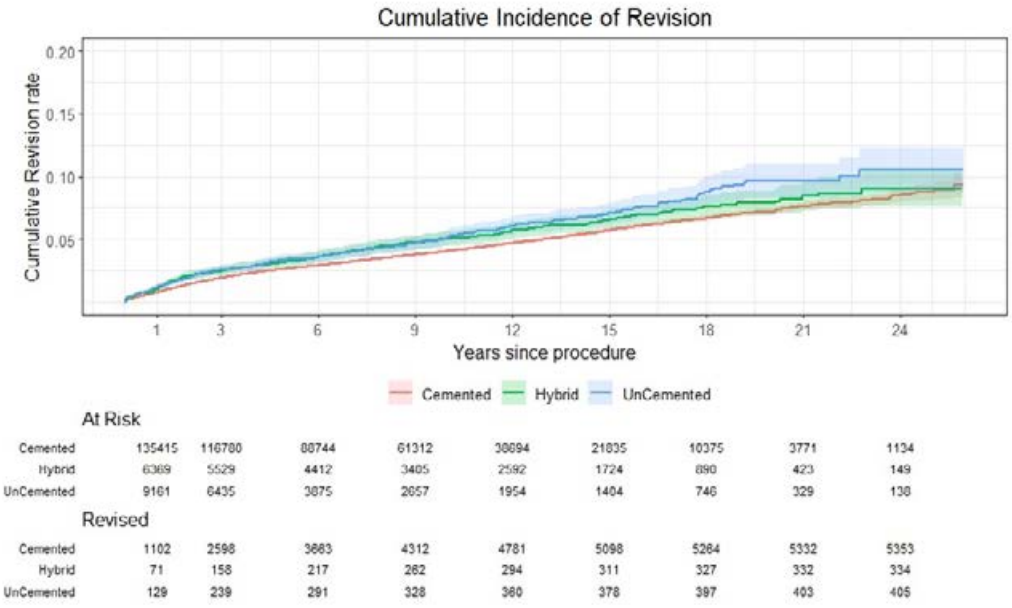
Bearing Constraint	N	Observed comp. years	Events	Rate/100-component-years	Lower CI	Upper CI
Cruciate Retaining	101,416	746,009.5	2,912	0.39	0.38	0.40
Other	16,020	200,621.2	883	0.44	0.41	0.47
Posterior Stabilising	38,300	341,790.6	1,916	0.56	0.54	0.59

TABLE 2.24

Survival by Cementation

Cementation	N	Observed comp. years	N Events	Rate/100-component-years	Lower CI	Upper CI
Cemented	145,312	1,236,032.2	5,336	0.43	0.42	0.44
Uncemented	11,601	67,822.4	405	0.60	0.54	0.66
Hybrid	6,868	67,049.6	331	0.49	0.44	0.55

TABLE 2.25



Survival by Age and Cementation

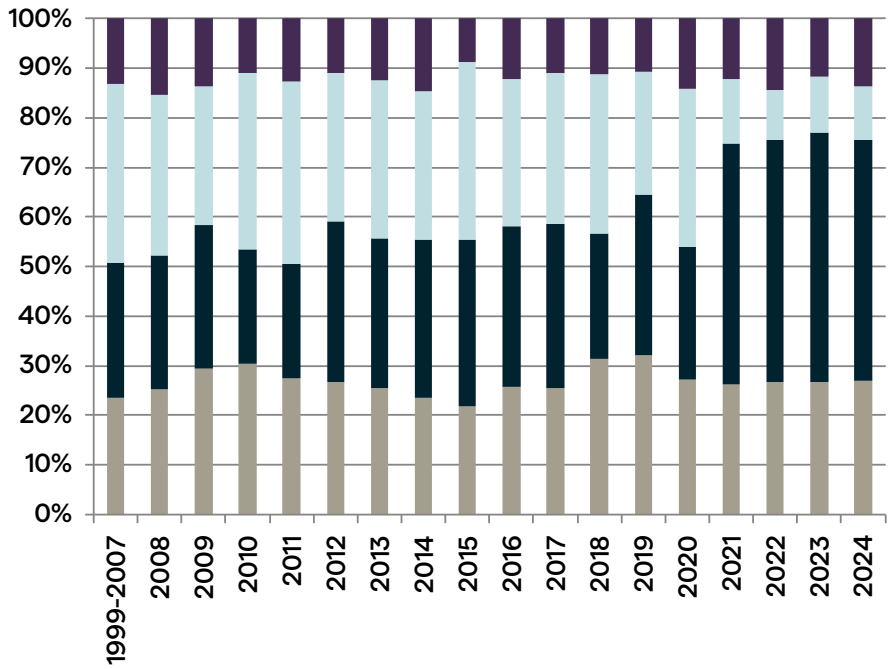
	N	Observed comp. years	N Events	Rate/100-component-years	Lower CI	Upper CI
Cemented						
<40	310	3,766.2	37	0.98	0.68	1.34
40-54	10,571	101,849.0	820	0.81	0.75	0.86
55-64	39,744	368,960.7	1,999	0.54	0.52	0.57
65-74	56,937	490,616.8	1,800	0.37	0.35	0.38
>=75	37,750	270,839.5	680	0.25	0.23	0.27
Uncemented						
<40	44	523.2	9	1.72	0.79	3.27
40-54	1,391	10,952.4	112	1.02	0.84	1.23
55-64	4,125	25,387.7	159	0.63	0.53	0.73
65-74	4,151	21,868.9	94	0.43	0.35	0.52
>=75	1,890	9,090.2	31	0.34	0.23	0.48
Hybrid						
<40	33	401.3	7	1.74	0.62	3.42
40-54	756	8,510.8	67	0.79	0.61	1.00
55-64	2,176	23,676.8	137	0.58	0.48	0.68
65-74	2,460	23,524.1	83	0.35	0.28	0.44
>=75	1,442	10,934.3	37	0.34	0.23	0.46

TABLE 2.26

Year	Loosening tibial component	Deep infection	Unexplained Pain	Loosening femoral component
	n	n	n	n
1999-2007	147	170	226	82
2008	43	46	55	26
2009	54	53	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	80	39
2015	59	91	97	24
2016	91	115	105	43
2017	86	112	103	37
2018	96	77	99	34
2019	109	110	84	36
2020	95	93	111	49
2021	69	128	34	32
2022	70	128	26	38
2023	80	151	34	35
2024	84	152	33	43

TABLE 2.27

Reason for Revision



Reason for Re-Revision	N	%
Deep infection	607	55.7
Unexplained Pain	172	15.8
Loosening tibial component	128	11.7
Loosening femoral component	124	11.4
Loosening patellar component	20	1.8
Periprosthetic Fracture	8	0.7
Instability	47	4.3
Fractured Femur	14	1.3
Fracture tibia	2	0.2
Total	**1,090**	

TABLE 2.28

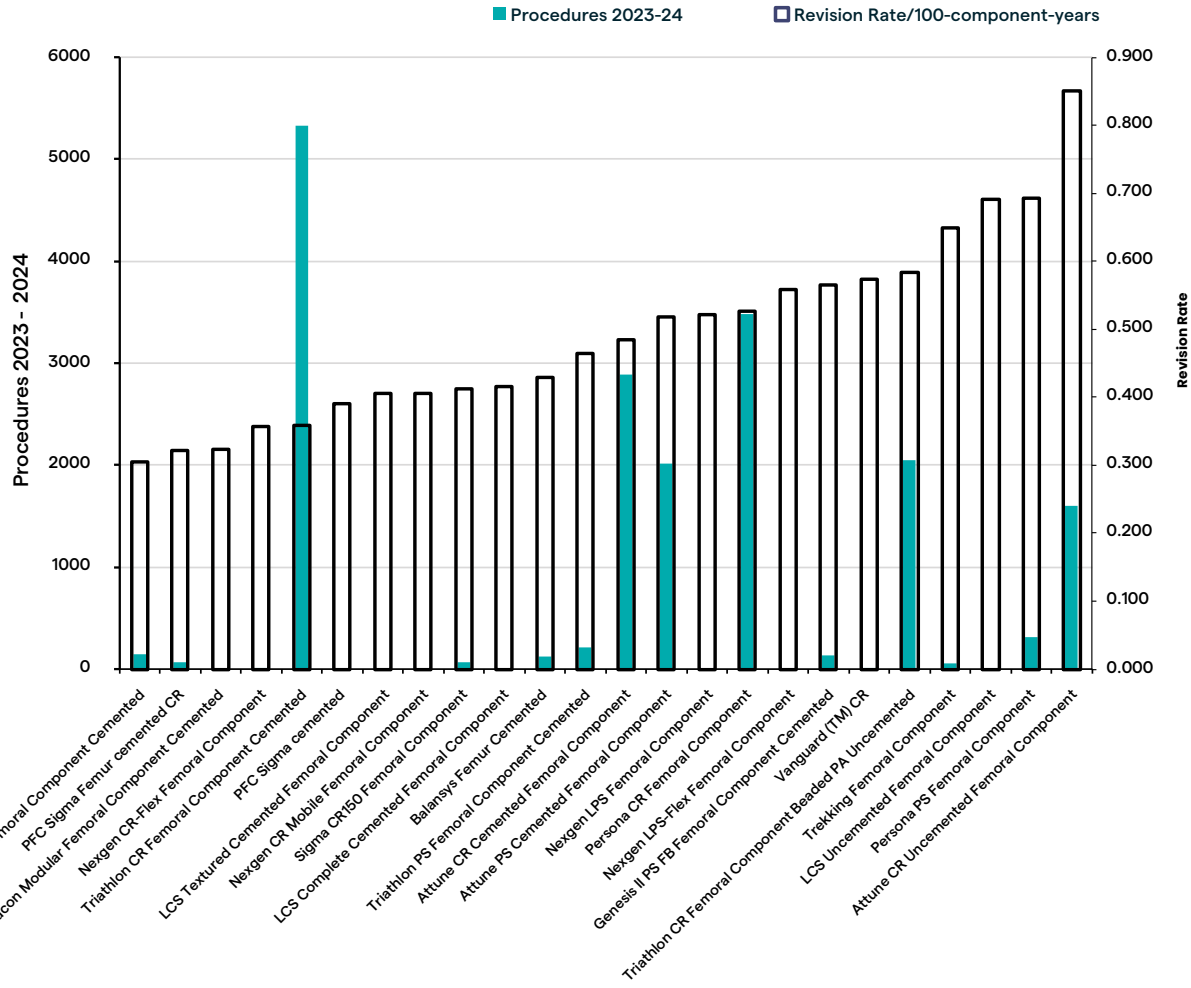
3rd Revisions	307
4th Revisions	92
5th Revisions	31

TABLE 29

Years from procedure	Loosening tibial component		Deep infection		Unexplained Pain		Loosening femoral component	
	Count	%	Count	%	Count	%	Count	%
0	64	4.7	706	40.7	173	12.3	23	3.6
1	113	8.3	272	15.7	343	24.3	46	7.2
2	143	10.4	153	8.8	206	14.6	44	6.9
3	134	9.8	130	7.5	127	9.0	46	7.2
4	107	7.8	81	4.7	98	6.9	59	9.2
5	102	7.5	65	3.7	74	5.2	48	7.5
6	103	7.5	65	3.7	64	4.5	37	5.8
7	92	6.7	45	2.6	62	4.4	40	6.3
8	72	5.3	31	1.8	53	3.8	36	5.6
9	82	6.0	36	2.1	39	2.8	38	5.9
10	56	4.1	26	1.5	40	2.8	29	4.5
>10	301	22.0	126	7.3	132	9.4	193	30.2
	1,369		**1,369**		**1,411**		**639**	

TABLE 2.30

The figure to the right summarises the 24 Knee prosthesis with >1000 procedures. Showing the number of procedures for the previous 2 years and the historical revision rate.



Knee Re-Revisions

Analysis was undertaken of re-revisions. There were 985 registered total knee revisions that had been revised twice, 264 that had been revised three times, 79 that had been revised four times and 27 that had been revised five times.

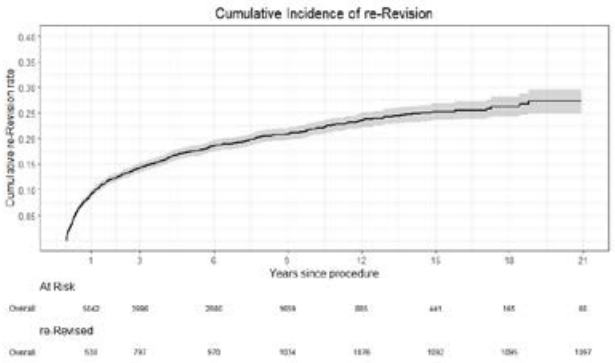
Re-Revisions

	N	Observed comp. years (ocys)	Events	Rate/100-component-years (95% CI)
Re-Revisions	6,072	37,606.1	1,090	2.90 (2.73-3.07)

TABLE 2.31

	N	Sum comp. Years	Events	Rate/100-component-years (95% CU)
Minor	2,973	17,475.9	572	3.27 (3.01-3.55)
Major	3,099	20,130.2	518	2.57 (2.36-2.80)

TABLE 2.32



Second revision

Time between the first and second revision for the 937 knee arthroplasties averaged 2.3 years, with a range of 1 day to 18.8 years. This compares to an average of 1,767 days (4.8 years) between primary and first revision knee arthroplasty.

Revision by Bearing Surface and Age Group

Years	N	% Re-revision free	Lower 95% CI	Upper 95% CI
1	5,024	90.96	90.22	91.70
2	4,454	87.73	86.88	88.58
3	3,985	85.83	84.91	86.75
4	3,536	84.20	83.23	85.18
5	3,075	82.65	81.62	83.68
6	2,673	81.55	80.48	82.63
7	2,312	80.88	79.77	81.98
8	1,950	79.62	78.46	80.79
9	1,652	79.19	77.99	80.38
10	1,339	78.32	77.07	79.58
11	1,096	77.36	76.04	78.69
12	881	76.65	75.26	78.05
13	712	75.78	74.29	77.27
14	570	75.42	73.88	76.96
15	438	74.82	73.18	76.45
16	326	74.60	72.91	76.29
17	233	74.60	72.91	76.29
18	164	73.93	72.02	75.84

TABLE 2.33

Patient Recorded Outcome Measures

Patient Reported Outcome Measures at Six months, Five, Ten, Fifteen and Twenty years

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 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
1	< 27	Poor
2	27-33	Fair
3	34-41	Good
4	>41	Excellent

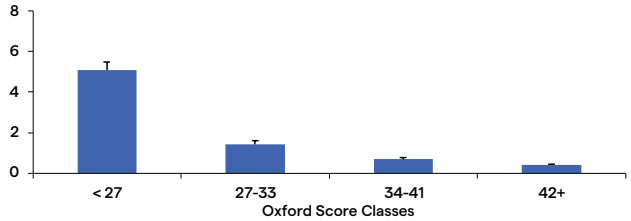
TABLE 2.34

For the twenty-five-year period, there were 41,152 primary knee questionnaire responses registered at six months post-surgery. The average score was 37.8 (standard deviation 8.0, range 0-48).

Kalairajah Classification at 6 months	Revision to 2 Years	No. revised within 2 years	%	Std error
Poor	3,762	198	5.26	0.36
Fair	5,477	73	1.33	0.15
Good	13,232	90	0.68	0.07
Excellent	14,495	61	0.42	0.05

TABLE 2.35

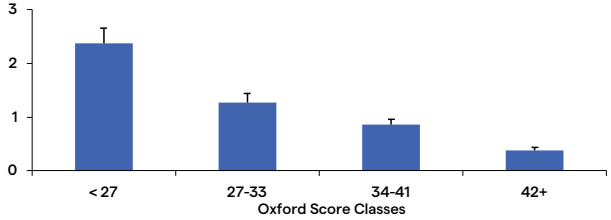
Revision (%) to 2 years by Oxford score at 6 months



Kalairajah Classification at 6 months	Revision to 2 to 4 Years	N revised	%	Std error
Poor	3,086	70	2.27	0.27
Fair	4,472	54	1.21	0.16
Good	10,550	87	0.82	0.09
Excellent	11,683	43	0.37	0.06

TABLE 2.36

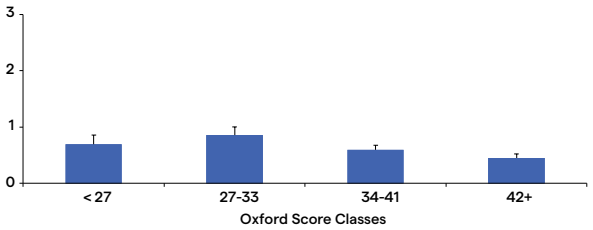
Revision (%) 2 to 4 years by Oxford score at 6 months



Kalairajah Classification at 6 months	Revision 4 to 6 years	N revised between 4 and 6 years	%	Std error
Poor	2,722	19	0.70	0.16
Fair	3,982	34	0.85	0.15
Good	9,365	56	0.60	0.08
Excellent	10,387	47	0.45	0.07

TABLE 2.37

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



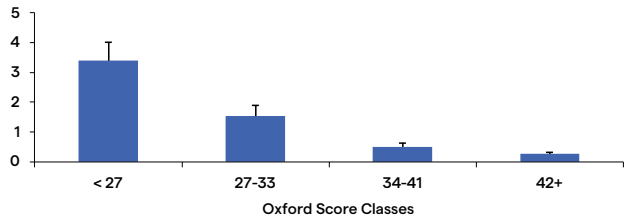
Questionnaires at five years post-surgery

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 14,942 individual patients. At five years post-surgery, 85% of patients achieved an excellent or good score and had an average of 40.7 (standard deviation 7.7, range 1-48).

Kalairajah Classification at 5 years	Revision to 2 years	No. revised within 2 years	%	Std error
Poor	912	31	3.40	0.60
Fair	1,204	18	1.50	0.35
Good	3,326	16	0.48	0.12
Excellent	8,321	22	0.26	0.06

TABLE 2.38

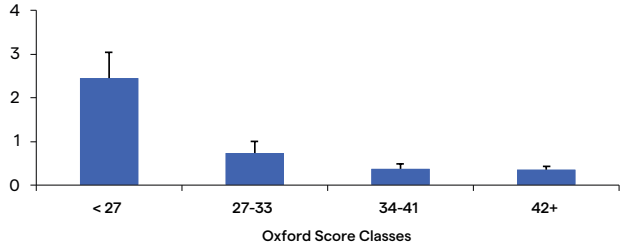
Revision (%) within 2 years by Oxford score at 5 Years



Kalairajah Classification at 5 years	Revision 2 to 4 years	N. revised	%	Std error
Poor	755	17	2.25	0.54
Fair	1,035	9	0.87	0.29
Good	2,897	11	0.38	0.11
Excellent	7,129	23	0.32	0.07

TABLE 2.39

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



Questionnaires at ten years post-surgery

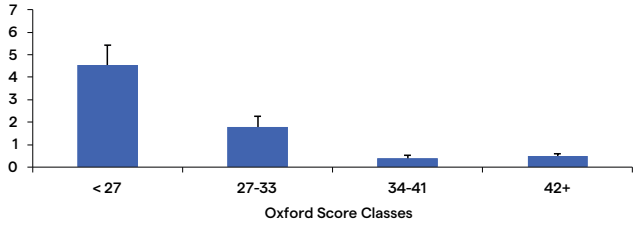
All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at ten years post-surgery. This dataset represents sequential Oxford knee scores for 9,104 individual patients.

At ten years post-surgery, 83% of patients achieved an excellent or good score and had an average of 40.2 (standard deviation 8.0, range 1-48).

Kalairajah Classification at 10 years	Revision to 2 years	N. revised	%	Std error
Poor	592	26	4.39	0.84
Fair	780	14	1.79	0.48
Good	1,970	7	0.36	0.13
Excellent	4,629	22	0.48	0.10

TABLE 2.40

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



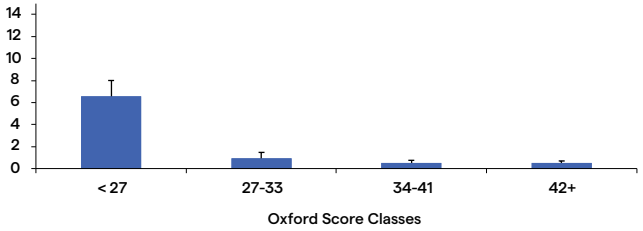
Questionnaires at fifteen years post-surgery

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 knee scores for 3,796 individual patients. At fifteen years post-surgery, 80% of patients achieved an excellent or good score and had an average of 39.6 (standard deviation 8.5, range 0-48).

Kalairajah Classification at 15 years	Revision to 2 years	N. revised	%	Std error
Poor	289	19	6.57	1.46
Fair	316	3	0.95	0.55
Good	771	4	0.52	0.26
Excellent	1,685	9	0.53	0.18

TABLE 2.41

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



Oxford 12 Score as a predictor of Knee Arthroplasty Revision

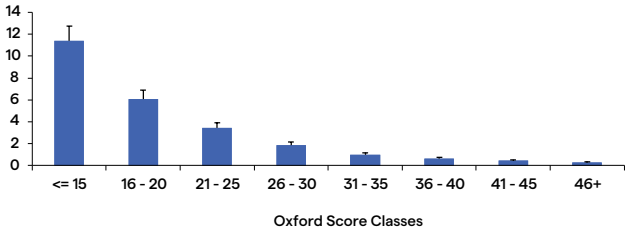
Six-month score and revision arthroplasty

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 Six Months	Revision to 2 years	N revised	%	Std error
<= 15	570	65	11.40	1.33
16 - 20	901	55	6.10	0.80
21 - 25	1,784	62	3.48	0.43
26 - 30	3,122	59	1.89	0.24
31 - 35	5,321	54	1.01	0.14
36 - 40	8,612	57	0.66	0.09
41 - 45	11,266	54	0.48	0.07
46+	5,390	16	0.30	0.07

TABLE 2.42

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



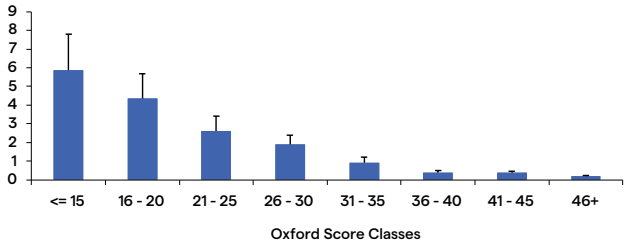
Five-year score and revision arthroplasty

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	N revised	%	Std error
<= 15	153	9	5.88	1.90
16 - 20	230	10	4.35	1.34
21 - 25	420	11	2.62	0.78
26 - 30	689	13	1.89	0.52
31 - 35	1,189	11	0.93	0.28
36 - 40	2,094	8	0.38	0.13
41 - 45	4,579	17	0.37	0.09
46+	4,409	8	0.18	0.06

TABLE 2.43

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

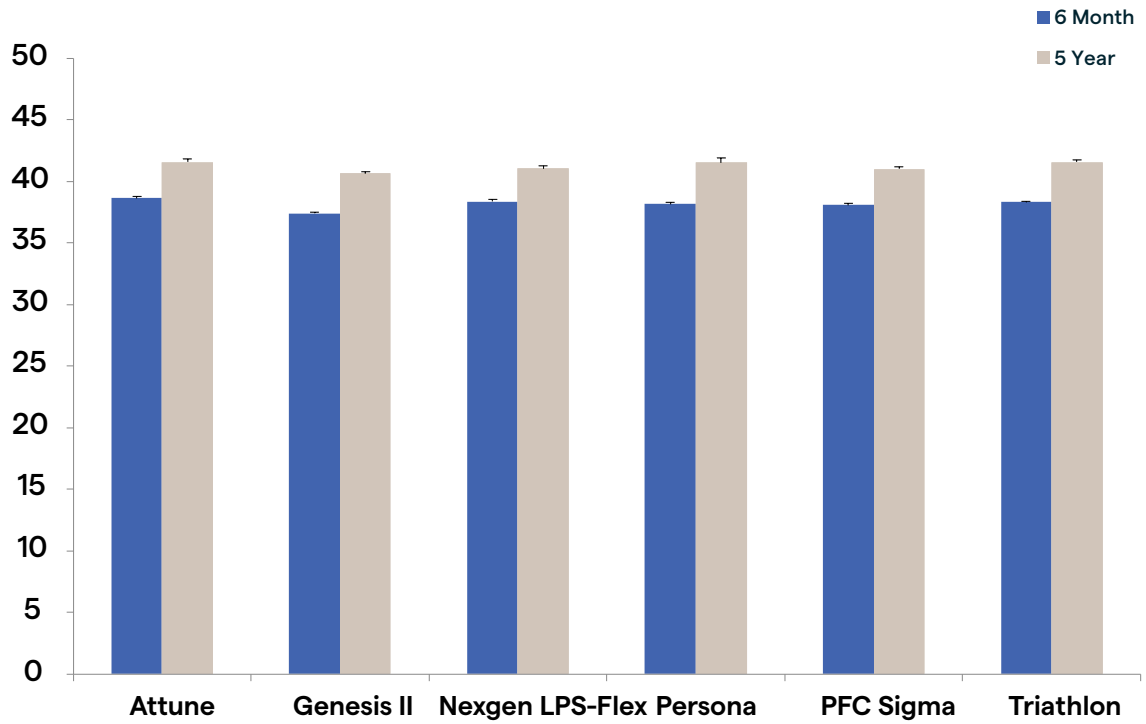


Oxford scores for 6 most common Knees prostheses with 6m and 5 years Oxford Scores

Prosthesis

Oxford Score		Attune cemented	Genesis II cemented	Nexgen LPS-Flex cemented	Persona cemented	PFC Sigma cemented	Triathlon cemented
6 Month	Mean	38.7	37.4	38.4	38.2	38.1	38.3
	Std. Error of Mean	0.10	0.13	0.16	0.14	0.14	0.08
	N	5,825	3,732	2,374	3,043	3,174	8,433
5 Year	Mean	41.6	40.7	41.0	41.5	41.0	41.6
	Std. Error of Mean	0.24	0.17	0.21	0.38	0.18	0.14
	N	932	1926	1348	423	1676	2496

TABLE 2.44



Oxford Score at 6 Months by BMI Category

Oxford Score 6 Months			
BMI	Mean	Std. Error of Mean	N
< 19	38.57	1.15	49
19 - 24	39.68	0.15	2222
25 - 29	39.19	0.09	6652
30 - 39	37.72	0.08	8652
40+	35.74	0.22	1403
Total	**38.32**	**0.06**	**18978**

TABLE 2.45

Revision Rate of Femoral Prostheses (number of procedures >100) in Alphabetical Order

Implant Catalogue Description	No. Ops.	Sum comp. Yrs	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Advance Primary Femoral Component	160	2,098.7	6	0.286	0.105	0.622
AGC Anatomic Interlok Femoral Component	365	4,767.3	16	0.336	0.192	0.545
Attune CR Cemented Femoral Component	12,342	57,410.2	278	0.484	0.428	0.544
Attune CR Uncemented Femoral Component	2,601	5,527.4	47	0.850	0.625	1.131
Attune PS Cemented Femoral Component	8,135	36,126.5	187	0.518	0.446	0.597
Attune PS Uncemented Femoral Component	801	1,311.0	15	1.144	0.612	1.839
Balansys Femur Cemented	1,913	15,150.6	65	0.429	0.331	0.547
Balansys PS Femur Cemented	112	926.6	10	1.079	0.481	1.915
Duracon Beaded Femoral Component Uncemented	797	12,017.1	29	0.241	0.162	0.347
Duracon Modular Femoral Component Cemented	3,442	48,020.7	155	0.323	0.273	0.377
Evolution MP CS/CR Cemented Femoral Component	119	285.2	2	0.701	0.085	2.533
Genesis II CR FB Femoral Component Cemented	7,921	87,148.9	266	0.305	0.269	0.344
Genesis II FB Femoral Component Cemented	200	2,579.8	16	0.620	0.340	1.007
Genesis II PS FB Femoral Component Cemented	7,084	72,538.4	410	0.565	0.512	0.623
GMK Sphere Femur Cemented	230	492.9	12	2.435	1.258	4.253
Insall/Burstein Femoral Component	248	3,317.4	48	1.447	1.067	1.918
Journey II BCS Femoral Component	995	4,756.4	48	1.009	0.735	1.326
LCS Complete Cemented Femoral Component	10,645	122,222.0	509	0.416	0.381	0.454
LCS Textured Cemented Femoral Component	3,881	55,564.2	225	0.405	0.353	0.460
LCS Uncemented Femoral Component	1,167	17,937.3	124	0.691	0.575	0.824
Legion Oxinium Cemented Femoral Component	150	1,305.1	6	0.460	0.169	1.001
Legion PS Uncemented Femoral Component	179	810.6	7	0.864	0.309	1.695
Maxim Primary Femoral Component	655	9,235.6	51	0.552	0.406	0.720
Maxim PS Femoral Component	165	2,337.7	21	0.898	0.556	1.373
MBK Cemented Femoral Component	246	3,794.2	18	0.474	0.281	0.750
Nexgen CR Femoral Component	486	6,437.2	24	0.373	0.239	0.555
Nexgen CR Mobile Femoral Component	1,566	15,310.3	62	0.405	0.310	0.519
Nexgen CR-Flex Femoral Component	8,110	90,925.5	325	0.357	0.319	0.398
Nexgen LCCK Femoral Component	329	2,661.5	25	0.939	0.593	1.364
Nexgen LPS Femoral Component	3,400	41,963.0	219	0.522	0.455	0.596
Nexgen LPS-Flex Femoral Component	5,073	59,493.9	332	0.558	0.500	0.621
Nexgen Mobile Femoral Component	789	8,894.2	51	0.573	0.422	0.748
Nexgen PS Mobile Femoral Component	909	10,317.1	52	0.504	0.372	0.655
Optetrak cemented	281	3,348.7	39	1.165	0.828	1.592
Optetrak uncemented	380	4,518.2	44	0.974	0.698	1.295
Persona CR Femoral Component	10,971	41,958.8	221	0.527	0.458	0.600

Implant Catalogue Description	No. Ops.	Sum comp. Yrs	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Persona PS Femoral Component	2,017	10,244.6	71	0.693	0.537	0.869
Persona Trabecular Metal CR Femoral Component	389	504.9	4	0.792	0.167	1.884
PFC Sigma cemented	1,040	14,101.6	55	0.390	0.294	0.508
PFC Sigma Femur cemented CR	10,094	118,855.4	383	0.322	0.291	0.356
PFC Sigma uncemented	537	4,883.1	26	0.532	0.340	0.768
Saiph Femoral Component	270	1,137.6	8	0.703	0.304	1.386
Scorpio CR Femoral Component	853	11,727.7	76	0.648	0.511	0.811
Sigma Cemented Femoral Component	402	3,101.2	3	0.097	0.013	0.258
Sigma CR150 Femoral Component	2,836	25,923.9	107	0.413	0.338	0.499
Trekking Femoral Component	1,086	7,858.7	51	0.649	0.483	0.853
Triathlon CR Femoral Component Beaded PA Uncemented	5,011	15,248.7	89	0.584	0.469	0.718
Triathlon CR Femoral Component Cemented	34,880	237,774.7	854	0.359	0.335	0.384
Triathlon PS Femoral Component Beaded PA Uncemented	108	1,122.6	3	0.267	0.055	0.781
Triathlon PS Femoral Component Cemented	3,681	34,417.2	160	0.465	0.396	0.543
Unity Knee CR Femur	233	258.7	0	0.000	0.000	1.426
Vanguard (TM) CR	1,754	16,029.2	92	0.574	0.460	0.700
Vanguard (TM) PS	620	5,801.3	48	0.827	0.610	1.097

Revision rate of Fully Cemented Femoral Prostheses sorted by Revision Rate (procedures >100)

Femur Prosthesis	No. Ops.	Observed comp years	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Triathlon CR Femoral Component Cemented	34,771	237,469.4	852	0.359	0.335	0.383
Attune CR Cemented Femoral Component	12,311	57,369.1	276	0.481	0.425	0.540
Persona CR Femoral Component	10,920	41,900.1	220	0.525	0.457	0.598
PFC Sigma Femur cemented CR	9,820	114,899.4	370	0.322	0.290	0.356
Attune PS Cemented Femoral Component	8,122	36,093.2	186	0.515	0.444	0.595
Genesis II CR FB Femoral Component Cemented	7,918	87,137.0	266	0.305	0.269	0.344
Nexgen CR-Flex Femoral Component	7,824	88,609.8	315	0.355	0.317	0.396
Genesis II PS FB Femoral Component Cemented	7,079	72,512.3	409	0.564	0.511	0.621
LCS Complete Cemented Femoral Component	6,131	72,617.9	262	0.361	0.318	0.407
Nexgen LPS-Flex Femoral Component	5,073	59,493.9	332	0.558	0.500	0.621
LCS Textured Cemented Femoral Component	3,835	54,824.1	221	0.403	0.351	0.459
Triathlon PS Femoral Component Cemented	3,676	34,409.3	160	0.465	0.396	0.543
Duracon Modular Femoral Component Cemented	3,440	47,978.5	155	0.323	0.273	0.377
Nexgen LPS Femoral Component	3,232	39,977.8	211	0.528	0.458	0.603
Sigma CR150 Femoral Component	2,414	23,015.1	89	0.387	0.309	0.473
Persona PS Femoral Component	2,015	10,243.4	71	0.693	0.537	0.869
Balansys Femur Cemented	1,912	15,148.2	65	0.429	0.331	0.547

Femur Prosthesis	No. Ops.	Observed comp years	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Vanguard (TM) CR	1,734	15,835.5	90	0.568	0.454	0.695
Nexgen CR Mobile Femoral Component	1,549	15,132.2	62	0.410	0.314	0.525
Trekking Femoral Component	1,082	7,844.5	50	0.637	0.473	0.840
Journey II BCS Femoral Component	987	4,747.4	48	1.011	0.736	1.329
PFC Sigma cemented	951	13,028.1	50	0.384	0.282	0.502
Nexgen PS Mobile Femoral Component	909	10,317.1	52	0.504	0.372	0.655
Scorpio CR Femoral Component	853	11,727.7	76	0.648	0.511	0.811
Nexgen Mobile Femoral Component	789	8,894.2	51	0.573	0.422	0.748
Maxim Primary Femoral Component	655	9,235.6	51	0.552	0.406	0.720
Vanguard (TM) PS	618	5,786.8	47	0.812	0.597	1.080
Sigma Cemented Femoral Component	402	3,101.2	3	0.097	0.013	0.258
AGC Anatomic Interlok Femoral Component	365	4,767.3	16	0.336	0.192	0.545
Nexgen LCCK Femoral Component	329	2,661.5	25	0.939	0.593	1.364
Optetrak cemented	281	3,348.7	39	1.165	0.828	1.592
Saiph Femoral Component	269	1,135.1	8	0.705	0.304	1.389
Insall/Burstein Femoral Component	248	3,317.4	48	1.447	1.067	1.918
MBK Cemented Femoral Component	246	3,794.2	18	0.474	0.281	0.750
Unity Knee CR Femur	233	258.7	0	0.000	0.000	1.426
GMK Sphere Femur Cemented	225	488.8	12	2.455	1.269	4.289
Genesis II FB Femoral Component Cemented	199	2,579.4	16	0.620	0.340	1.007

Femur Prosthesis	No. Ops.	Observed comp years	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Legion PS Uncemented Femoral Component	176	808.3	7	0.866	0.310	1.700
Maxim PS Femoral Component	165	2,337.7	21	0.898	0.556	1.373
Advance Primary Femoral Component	160	2,098.7	6	0.286	0.105	0.622
Legion Oxinium Cemented Femoral Component	150	1,305.1	6	0.460	0.169	1.001
Evolution MP CS/CR Cemented Femoral Component	119	285.2	2	0.701	0.085	2.533
Balansys PS Femur Cemented	112	926.6	10	1.079	0.481	1.915

Revision rate of Uncemented Femoral Prostheses sorted by Revision Rate (Procedures >=50)

Femur Prosthesis	N	Observed comp years	N Revised	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Attune PS Uncemented Femoral Component	596	735.9	11	1.495	0.699	2.587
LCS Uncemented Femoral Component	524	8,647.7	83	0.960	0.764	1.190
Attune CR Uncemented Femoral Component	2,403	5,153.2	43	0.834	0.604	1.124
Nexgen CR Femoral Component	54	653.1	4	0.612	0.167	1.568
LCS Complete Cemented Femoral Component	2,721	30,072.4	166	0.552	0.470	0.641
Triathlon CR Femoral Component Beaded PA Uncemented	4,355	12,827.4	67	0.522	0.405	0.663
Nexgen LPS Femoral Component	136	1,603.2	8	0.499	0.215	0.983
Persona Trabecular Metal CR Femoral Component	106	202.4	1	0.494	0.013	2.753
Duracon Beaded Femoral Component Uncemented	470	6,593.6	14	0.212	0.111	0.347

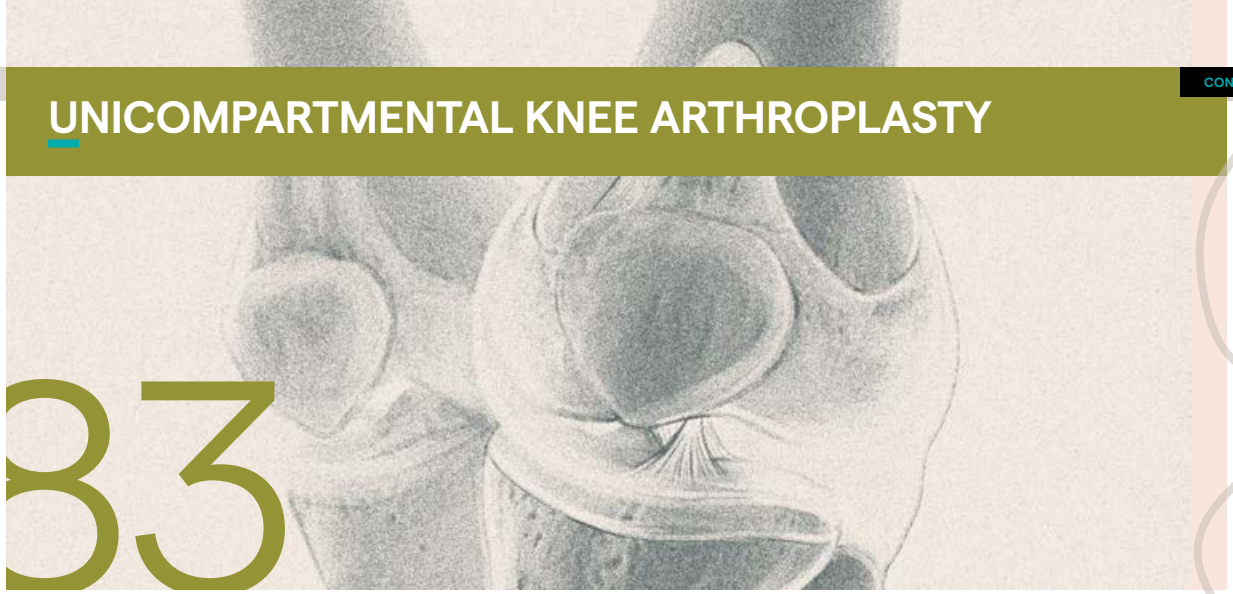
Revision rate of Hybrid Femoral Prostheses sorted by Revision Rate (Procedures >=50)

Femur Prosthesis	N	Observed comp years	N Revised	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Optetrak uncemented	380	4,518.2	44	0.974	0.698	1.295
Triathlon CR Femoral Component Beaded PA Uncemented	627	2,375.3	22	0.926	0.580	1.402
Attune CR Uncemented Femoral Component	190	365.9	3	0.820	0.169	2.396
Triathlon CR Femoral Component Cemented	73	248.7	2	0.804	0.097	2.905
Persona Trabecular Metal CR Femoral Component	245	267.1	2	0.749	0.091	2.705
Attune PS Uncemented Femoral Component	196	563.6	4	0.710	0.193	1.817
Sigma CR150 Femoral Component	421	2,906.4	18	0.619	0.367	0.979
PFC Sigma uncemented	533	4,822.2	26	0.539	0.344	0.778
Nexgen CR-Flex Femoral Component	250	1,956.6	10	0.511	0.245	0.940
PFC Sigma cemented	89	1,073.5	5	0.466	0.126	1.021
LCS Uncemented Femoral Component	643	9,289.6	41	0.441	0.312	0.593
LCS Complete Cemented Femoral Component	1,793	19,531.8	81	0.415	0.329	0.515
Nexgen CR Femoral Component	430	5,769.2	20	0.347	0.205	0.525
PFC Sigma Femur cemented CR	271	3,905.7	13	0.333	0.168	0.553
Triathlon PS Femoral Component Beaded PA Uncemented	69	928.4	3	0.323	0.067	0.944
Duracon Beaded Femoral Component Uncemented	327	5,423.5	15	0.277	0.155	0.456

Revision rate of Femoral Prostheses by Bearing Constraint sorted by Revision Rate

Femur Prosthesis	Bearing Constraint	N Obs	Observed comp years	Events	Rate/100-comp years	Lower 95% CI	Upper 95% CI
Attune cemented	CR	12,340	57,409.1	278	0.484	0.428	0.544
	PS	8,128	36,115.0	187	0.518	0.446	0.598
Attune uncemented	CR	2,599	5,525.8	47	0.851	0.625	1.131
	PS	781	1,288.8	15	1.164	0.623	1.871
Balansys	CR	1,675	14,652.6	61	0.416	0.318	0.535
	PS	112	926.6	10	1.079	0.481	1.915
Genesis II cemented	CR	7,921	87,148.9	266	0.305	0.269	0.344
	PS	7,067	72,468.2	408	0.563	0.510	0.620
Genesis II uncemented	CR	38	569.8	3	0.526	0.109	1.539
	PS	2	30.9	0	0.000	0.000	11.938
Maxim	CR	655	9,235.6	51	0.552	0.406	0.720
	PS	165	2,337.7	21	0.898	0.556	1.373
Nexgen cemented	CR	1,566	15,310.3	62	0.405	0.310	0.519
	PS	909	10,317.1	52	0.504	0.372	0.655
Nexgen Flex cemented	CR	8,109	90,921.4	324	0.356	0.318	0.397
	PS	5,073	59,493.9	332	0.558	0.500	0.621
Persona cemented	CR	10,966	41,948.1	221	0.527	0.459	0.600
	PS	2,000	10,234.1	70	0.684	0.529	0.859
PFC Sigma cemented	CR	9,165	106,056.9	313	0.295	0.263	0.329
	PS	991	13,369.2	55	0.411	0.310	0.535
Triathlon cemented	CR	34,880	237,774.7	854	0.359	0.335	0.384
	PS	3,668	34,394.4	159	0.462	0.392	0.538
Triathlon uncemented	CR	4,924	15,132.6	86	0.568	0.455	0.702
	PS	104	1,115.2	3	0.269	0.055	0.786
Vanguard ™	CR	1,754	16,029.2	92	0.574	0.460	0.700
	PS	620	5,801.3	48	0.827	0.610	1.097

UNICOMPARTMENTAL KNEE ARTHROPLASTY



83

UNICOMPARTMENTAL KNEE ARTHROPLASTY

The data analysis is for the **twenty-six-year** period January 1999 – December 2024. There were 19,162 unicompartmental knee procedures registered. There were 1,181 new procedures registered in 2024.

Data analysis

This includes new form and legacy data.

Age and sex distribution

The average age for a unicompartmental knee replacement was 66.1 years, with a range of 19.5 – 95.5 years.

	Female	Male
Number	8,411	10,051
Percentage	43.9	56.1
Mean age	65.9	66.2
Maximum age	94.7	66.2
Minimum age	28.1	95.5
Standard dev.	10.1	9.3

TABLE 3.1

Age Groups (Years)

<55	2465	12.9%
55-64	6470	33.8%
65-74	6574	34.3%
>=75	3653	19.1%

TABLE 3.2

Ethnicity

Asian	228	1.3%
Euro/Other	16739	94.7%
Māori	610	3.5%
Pacifica	104	0.6%

TABLE 3.3

Operation Type

Cemented	10157	53.0%
Uncemented	8185	42.7%
Hybrid	820	4.3%

TABLE 3.4

Approach

Medial parapatellar	15172	79.2%
Lateral parapatellar	465	2.4%

TABLE 3.5

Surgical Adjuncts

Not Image guided	18,735	97.8%
Image guided	427	2.2%

TABLE 3.6

Body Mass Index

For the 15-year period 2010 - 2024, there were 12,035 BMI registrations for unicompartmental knee replacements. The average was 30.2 kg/m2 with a range of 15.0 – 66.5 and a standard deviation of 5.1.

Previous operation	N
None	15,773
Menisectomy	2667
Osteotomy	81
Ligament reconstruction	156
Internal fixation	57
Synovectomy	6
Other	217

TABLE 3.7

Diagnosis	N	%
OA	18,781	98.0
RA	57	0.3
Dysplasia	109	0.6
Fracture NOF	53	0.3
Avascular Necrosis	161	0.8
Tumour	0	0.0%

TABLE 3.8

Surgeon Attire

Surgical Helmet Systems	5,425
Conventional Gown	2,291

ASA Class

This was introduced with the updated forms at the beginning of 2005. For the seventeen- year period 2005 – 2024, there were 16,207 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	N	%
1	2,716	16.8
2	10,410	64.2
3	3,045	18.8
4	36	0.2

TABLE 3.9

Operative time (skin to skin)

The average operative time was **67 minutes**, with a standard deviation of 36 minutes.

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the eighteen- year period 2005 – 2024.

Surgeon grade	N
Consultant	15,699
Advanced trainee supervised	763
Advanced trainee unsupervised	133

TABLE 3.10

Surgeon and hospital workload

Surgeons

In 2024, 88 surgeons performed 1,095 unicompartmental knee replacements, an average of 12 procedures per surgeon.

49 surgeons performed less than 10 procedures and 39 surgeons performed greater or equal to 10 procedures.

Hospitals

In 2023, unicompartmental knee replacements were performed in 42 hospitals; 18 were public and 24 were private.

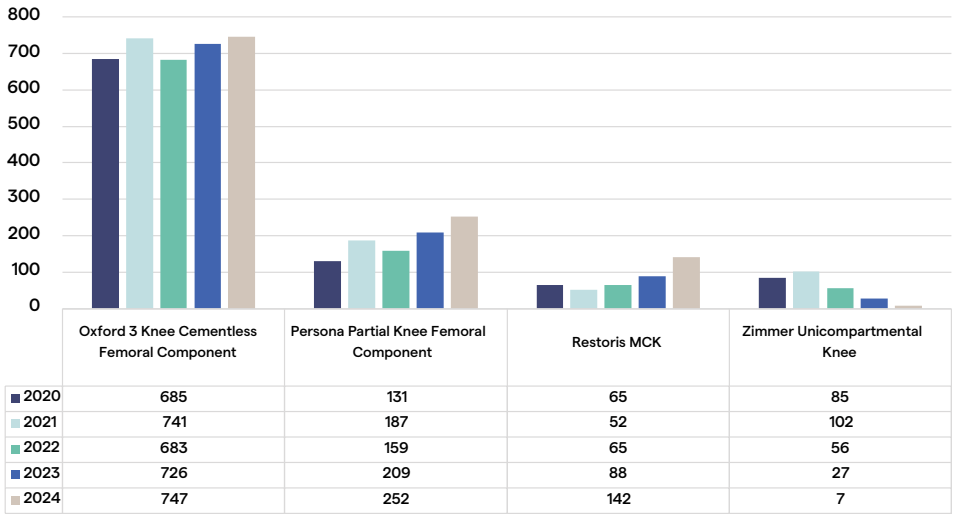
Prosthesis Usage

Unicompartmental knee prostheses used in the entire registry (Number of Procedures >25)

Prosthesis	All Years	2020-2024
Oxford 3 Knee Cementless Femoral Component	8863	3582
Persona Partial Knee Femoral Component	1120	938
Restoris MCK	550	412
Zimmer Unicompartmental Knee	1870	277
Journey Uni	96	53
Triathlon PKR Femur	291	53
Oxford 3 Uni Knee Cemented Femoral Component	4232	52
Sigma HP Uni	222	48
Repicci II	97	0
Preservation	483	0
Oxinium Uni	33	0
Optetrak Unicondylar Cemented	101	0
Miller/Galante	710	0
Genesis Unicompartmental Knee	358	0
Freedom Active Unicompartmental Knee	36	0

TABLE 3.11

Most Used Unicompartmental Prostheses for 5 years – 2020 to 2024



	Oxford 3 Knee Cementless Femoral Component	Persona Partial Knee Femoral Component	Restoris MCK	Zimmer Unicompartmental Knee
2020	685	131	65	85
2021	741	187	52	102
2022	683	159	65	56
2023	726	209	88	27
2024	747	252	142	7

Revision of Registered Primary Unicompartmental Arthroplasties

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

There were 1,594 revisions of the 17,981 registered unicompartmental knee replacements.

A further 192 had a second-, 37 a third-, 6 a fourth and two had a fifth revision.

1,340 were revised to total knee replacements.

Time to revision	Days	(Equiv. years)
Average	2,457	6.7
Maximum	8,301	
Minimum	1	
Standard Deviation	1,992	

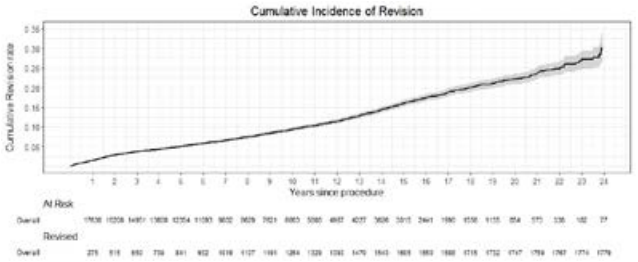
TABLE 3.12

Reason for revision	N
Unexplained Pain	388
Loosening tibial component	251
Loosening femoral	164
Deep infection	67
Fracture tibia	52
Fracture femur	7

TABLE 3.13

N	Sum Comp. Years	Events	Rate/ 100 Comp. Years	Lower (95% CI)	Upper (95% CI)
19,162	158,639.0	1,780	1.1220	1.07	1.18

TABLE 3.14



Revision by Gender

Sex	No. Ops	Obs. comp. years)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Female	8,411	73,156.9	891	1.22	1.14	1.30
Male	10,751	85,482.1	889	1.04	0.97	1.11

TABLE 3.15

Revision versus Age Bands

Age Groups	No. Ops	Obs. comp. years)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
<55	2,465	21,189.2	396	1.87	1.69	2.06
55-64	6,470	57,528.0	788	1.37	1.28	1.47
65-74	6,574	54,474.8	438	0.80	0.73	0.88
>=75	3,653	25,447.1	158	0.62	0.53	0.72

TABLE 3.16

Revision by Ethnicity

Ethnicity	N	Sum comp. Years	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Asian	228	1,816.1	11	0.61	0.30	1.08
Euro/ Other	16,739	145,616.1	1654	1.14	1.08	1.19
Māori	610	4,732.3	57	1.20	0.91	1.56
Pacifica	104	861.8	7	0.81	0.33	1.67

TABLE 3.17

Revision by Surgeon Annual Workload

Consultant No. of ops/year	No. Ops.	Obs comp. Years	Number revised	Rate/100 comp. years	Exact 95% conf interval	
<10	6,863	66,848.0	857	1.28	1.20	1.37
>=10	12,295	91,773.6	922	1.00	0.94	1.07

TABLE 3.18

Revision by Arthroplasty Fixation

Fixation	No. Ops	Obs. comp. years)	N Revised	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Cemented	9,730	96,832.5	1,171	1.21	1.14	1.28
Uncemented	7,480	43,089.5	355	0.82	0.74	0.91
Hybrid	771	5,178.9	68	1.31	1.02	1.66

TABLE 3.19

Revision vs. Surgical Approach

Surgical Approach	No. Ops	Obs. comp. years	N Rev	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Medial parapatellar	15,172	120,609.0	1375	1.14	1.08	1.20
Lateral parapatellar	465	3,479.0	58	1.67	1.27	2.16

TABLE 3.20

Revision versus Adjunct

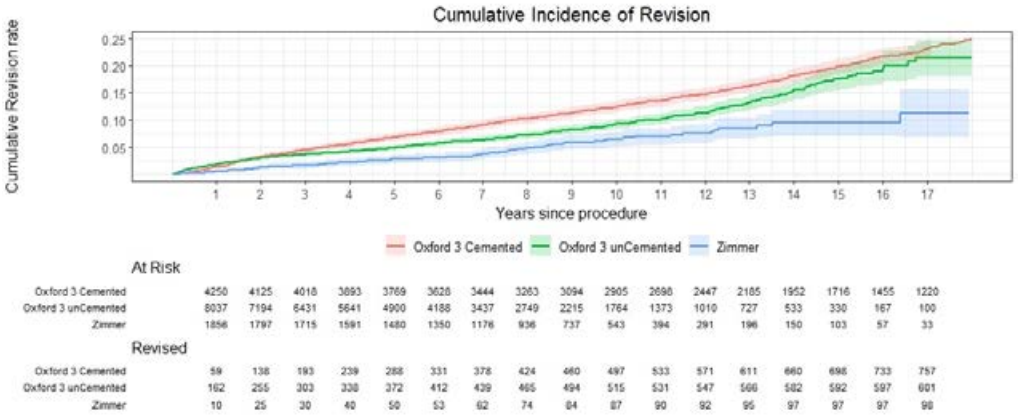
	No. Ops	Obs. comp. years	N Rev	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Not Image guided	18,735	156,268.0	1,755	1.12	1.07	1.18
Image guided	427	2,371.0	25	1.05	0.00	1.56

TABLE 3.21

Oxford 3 uncemented	No. Ops	Sum comp. years)	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Not Lateral Domed	8,612	52,119.5	533	1.02	0.94	1.11
Oxford 3 Lateral Domed	344	3,039.4	68	2.24	1.74	2.84
Oxford 3 uncemented ALL	8,956	55,158.9	601	1.09	1.00	1.18

TABLE 3.22

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



Revision Rate of Individual Unicompartmental Knee Prostheses Sorted Alphabetically N>50

Femoral Component	N	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Genesis Unicompartmental Knee	358	4,761.00	58	1.22	0.93	1.57
Journey Uni	96	375.5	10	2.66	1.28	4.9
Miller/Galante Uni Knee	710	10,190.30	99	0.97	0.79	1.18
Optetrak Unicondylar Cemented	101	1,248.10	17	1.36	0.79	2.18
Oxford 3 Knee Cementless	8,863	54,803.30	510	0.93	0.85	1.01
Oxford 3 Uni Knee Cemented	4,232	54,178.50	749	1.38	1.29	1.49
Persona Partial	1,120	3,025.40	29	0.96	0.64	1.38
Preservation	483	6,459.30	109	1.69	1.39	2.04
Repicci II	97	1,313.20	30	2.28	1.54	3.26
Restoris MCK	550	1,607.70	16	1	0.57	1.62
Sigma HP Uni	222	1,718.90	11	0.64	0.32	1.15
Triathlon PKR	291	2,390.80	22	0.92	0.56	1.37
Zimmer Unicompartmental Knee	1,870	15,261.70	85	0.56	0.44	0.69

TABLE 3.23

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

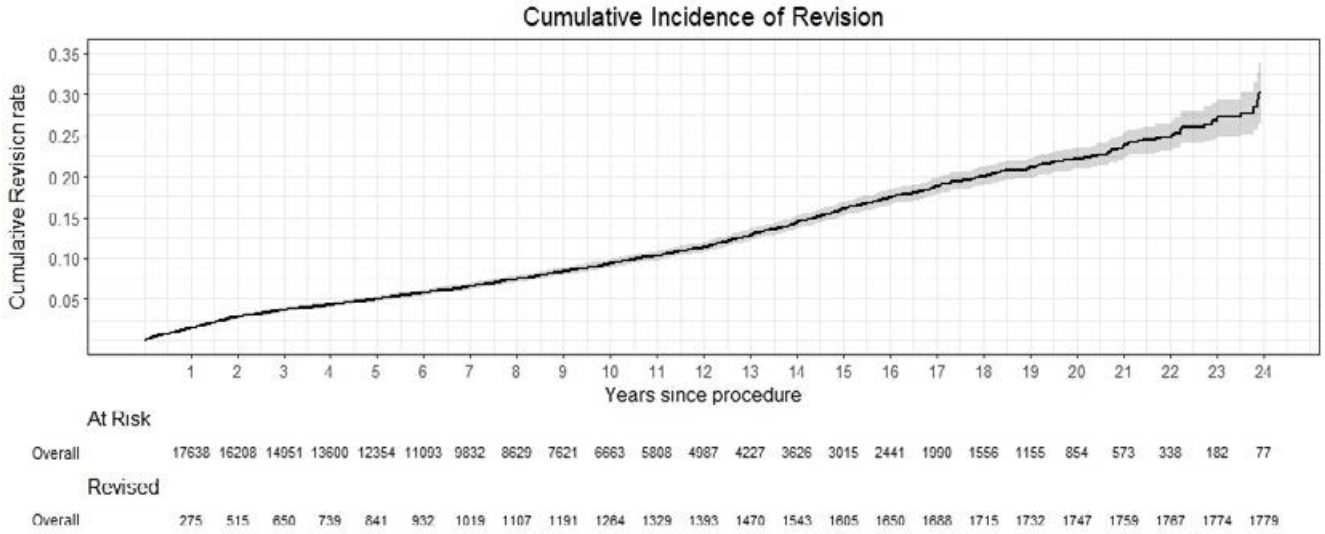
	Loosening Femur		Loosening Tibia		Pain	
Years since operation	Count	%	Count	%	Count	%
0	14	8.2	43	15.9	55	14.0
1	27	15.8	51	18.9	87	22.1
2	10	5.8	27	10.0	44	11.2
3	18	10.5	19	7.0	18	4.6
4	5	2.9	12	4.4	37	9.4
5	12	7.0	10	3.7	20	5.1
6	6	3.5	14	5.2	21	5.3
7	12	7.0	10	3.7	19	4.8
8	10	5.8	8	3.0	15	3.8
9	9	5.3	14	5.2	15	3.8
10	8	4.7	7	2.6	15	3.8
11+	40	23.4	55	20.4	48	12.2
Total	**171**		**270**		**394**	

TABLE 3.24

Cumulative Incidence of Revision

The following Kaplan Meier survival analyses are for the 24 years from 2000 to 2024, with deceased patients censored at time of death.

Cumulative Incidence of Revision



Survival Curve – Unicompartmental Knees

Years	% Revision-free	N
1	98.5	17,638
2	97.1	16,208
3	96.3	14,951
4	95.7	13,600
5	94.9	12,354
6	94.2	11,093
7	93.4	9,832
8	92.5	8,629
9	91.6	7,621
10	90.6	6,663
11	89.7	5,808
12	88.7	4,987

Years	% Revision-free	N
13	87.2	4,227
14	85.6	3,626
15	84.0	3,015
16	82.6	2,441
17	81.2	1,990
18	79.9	1,556
19	79.0	1,155
20	77.8	854
21	76.4	573
22	75.1	338
23	73.2	182
24	70.0	77

TABLE 3.25

Patient Recorded Outcome Measures

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

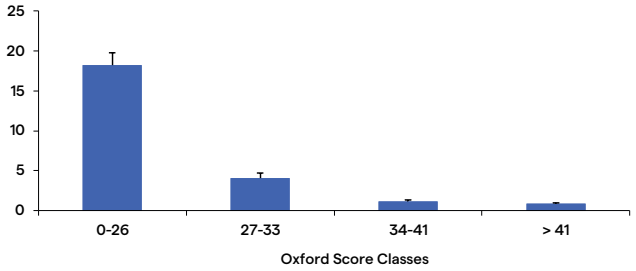
TABLE 3.26

For the twenty-four-year period, there were 9,955 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
0-26	579	104	17.96	1.60
27-33	1,003	41	4.09	0.63
34-41	3,157	36	1.14	0.19
> 41	5,216	43	0.82	0.13

TABLE 3.27

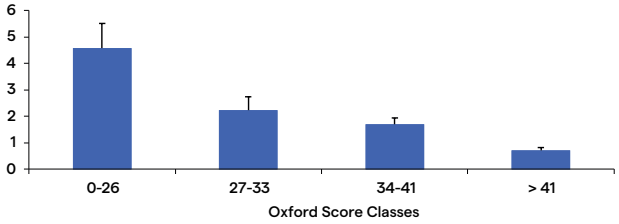
Revision (%) to 2 years by Oxford score at 6 months



Score Group at 6 months	Revision 2 - 4 years	No. revised	%	Std error
0-26	504	24	4.76	0.95
27-33	897	19	2.12	0.48
34-41	2,757	47	1.70	0.25
> 41	4,543	33	0.73	0.13

TABLE 3.28

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



Questionnaires at five years post-surgery

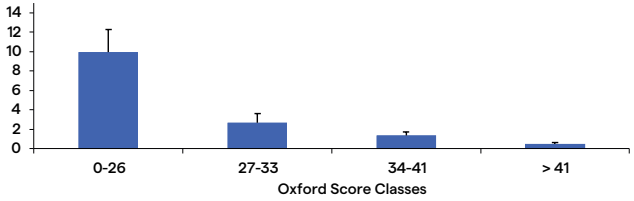
All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at five years post-surgery. There were 4,117 unicompartmental knee questionnaire responses registered at five years post-surgery.

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	186	17	9.14	2.11
27-33	284	7	2.46	0.92
34-41	944	13	1.38	0.38
> 41	2,703	13	0.48	0.13

TABLE 3.29

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



Questionnaires at ten years post-surgery

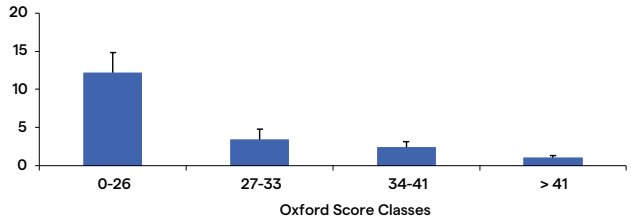
All patients who had a six-month registered questionnaire, and who had not had revision surgery were sent a further questionnaire at ten years post-surgery. There were 2,065 unicompartmental knee questionnaire responses registered at ten years post-surgery.

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.

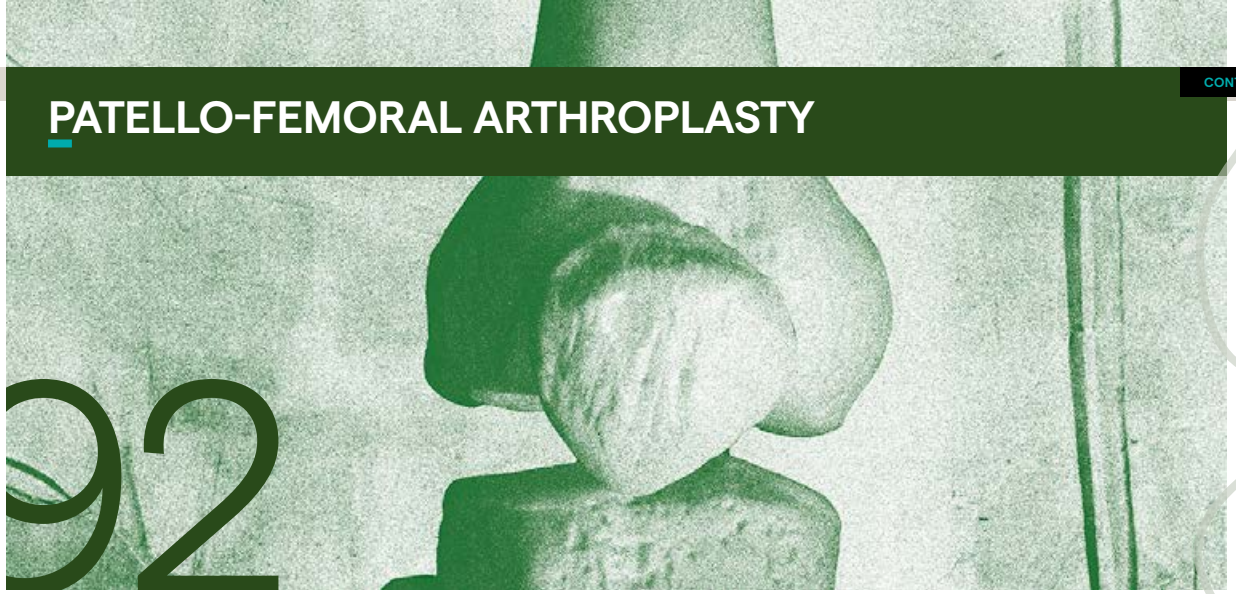
Score Group at 10 years	Revision to 2 years	No. revised	%	Std error
0-26	153	19	12.42	2.67
27-33	184	6	3.26	1.31
34-41	480	11	2.29	0.68
> 41	1,385	13	0.94	0.26

TABLE 3.30

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



PATELLO-FEMORAL ARTHROPLASTY



The data analysis is for the **twenty-six-year** period January 1999 – December 2024.
There were 1,111 patellofemoral knee procedures registered, with 135 new procedures registered in 2024.

DATA ANALYSIS

This includes new form and legacy data.

Age and sex distribution of Patellofemoral Arthroplasty Patients

	Age			
	Mean	Minimum	Maximum	N
Female	60.1	31.1	89.4	784
Male	61.9	31.2	90.7	327
Total	**60.7**	**31.1**	**90.7**	**1,111**

TABLE 4.1

Patellofemoral Prostheses Registered 1999-2024

Femoral Component	N
Gender Solutions Patellofemoral Component	794
Avon Patellofemoral Component	129
Journey PFJ Femoral Implant	91
Restoris Patellofemoral Component	40
Ossis Custom device	10
LCS Textured Cemented Femoral Component	6
Persona Cemented Femur CR	5
Triathlon CR Femoral Component Cemented	5
Attune CR Uncemented Femoral Component	4
P F Wave Femoral Component	4
Triathlon CR Femoral Component Beaded PA Uncemented	4
Attune CR Cemented Femoral Component	3
Custom Patellofemoral Implant	3
Genesis II PS FB Femoral Component Cemented	3
Attune PS Cemented Femoral Component	2
Custom Delta Patellofemoral Component	1
Legion PS cemented Component	1
Mod3 Femoral Component	1
Oxford 3 Knee Cementless Femoral Component	1
Patient Specific Patellofemoral Component	1
RBK Patellofemoral Component	1
Trochlee Themis Patellofemoral Component	1
Total	**1,110**

TABLE 4.2

Revision Rate

N	Observed comp. years (ocys)	N. Revised	Rate/100-component-years (95% CI)
1,111	7,106.9	133	1.8714 (1.57-2.22)

TABLE 4.3

The revision rate is four times that for total knee arthroplasty (1.8714 versus 0.4439/100-component-years).

Re-revisions	N
Revised to Total	112
Revised to Uniknee	3
Revised to Patellofemoral	3

TABLE 4.4

Revision of Patellofemoral knees

Of the registered primary patellofemoral procedures, n = 120 have been revised.

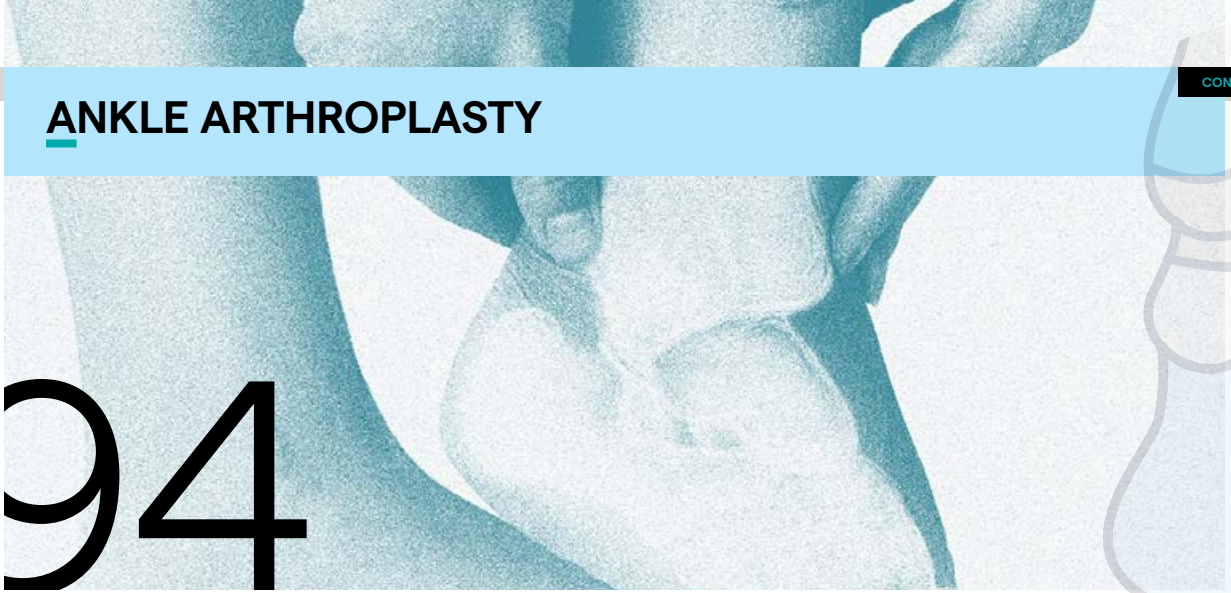
Time to Revision from Primary Procedure	Days	(Equiv. years)
Average		6.1
Maximum	6,880	18.8
Minimum	108	

TABLE 4.5

Reason for revision	N
Pain	34
Wear in Non-Replaced Compartment	24
Deep Infection	7
Loosening Patellar	6
Instability	4
Loosening Femur	2
PolyWear	2
Loosening Tibia	0
Periprosthetic Fracture	0
Fracture Femur	0
Fracture Tibia	0
Stiffness/Arthrofibrosis	0

TABLE 4.6

ANKLE ARTHROPLASTY



94

PRIMARY ANKLE ARTHROPLASTY

The **twenty-six-year** New Zealand Joint Registry report analyses ankle arthroplasty data for the 25-year period January 2000 – December 2024. There were 2,685 primary ankle procedures registered. This is an addition of 294 compared to last year's report.

Data analysis

Data analysis includes the data collected from January 2000 onwards and relates to all 2,685 registered primary ankle arthroplasties and smaller data sets collected from subsequent dates when the data forms have been revised. Data form modifications occurred in 2005, 2010 and November 2020.

- The 2005 form added ASA and registrar primary surgeon supervision data
- The 2010 form added BMI
- The November 2020 form was significantly revised 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" as pain is not a diagnosis in and of itself. 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 807 new ankles registered using the current form. Small variations in numbers reported versus previous years and apparent discrepancies in tallies since the new data forms were introduced reflect late data form deliveries and historic forms being used on occasion.

Age, sex and ethnicity distribution

The average age for an ankle replacement was 67 years, with a range of 32 – 96 years.

	Female	Male
Number	1062	1,623
Percentage	40	60
Mean age	66.9	66.8
Maximum age	95.5	91.8
Minimum age	32.3	33.4
Standard dev.	9.0	8.9

TABLE 5.1

Age Groups (years)	N	%
<40	15	0.6
40-54	228	8.5
55-64	797	29.7
65-74	1,133	42.2
>=75	512	19.1
Total	**2,685**	**100.0**

TABLE 5.2

Patient ethnicity data was added to the reports from 2022 onwards. The data is obtained from the national NHI dataset using the NHI from the patient label on the registry forms.

Ethnicity	N	%
Asian	26	1.0
Euro/Other	2,463	93.4
Māori	105	4.0
Pacifica	44	1.7
Total	**2,638**	**100.0**

TABLE 5.3

Body Mass Index

For the 2010- 2024 period, there were 1,596 BMI registrations for primary ankle replacements. The average was 29.4 kg/m2 with a range of 17 – 54.

BMI (kg/m²)	N	%
< 19	3	0.2
19 - 24	263	16.5
25 - 29	678	42.5
30 - 39	588	36.8
40+	64	4.0
Total	**1,596**	**100.0**

TABLE 5.4

Previous operation	N	%
None	2,192	76.6
Internal fixation for juxtarticular fracture	294	10.6
Osteotomy	24	0.9
Arthrodesis	60	2.2
Ligament reconstruction	22	0.8
Subjacent fusion	37	1.3
Other	211	7.6
Total in data set	**2,770**	**100.0**

TABLE 5.5

Not all procedures record a previous operation; some may have more than one.

Diagnosis	N	%
Osteoarthritis	2,023	76.0
Rheumatoid arthritis	191	7.2
Other inflammatory	51	1.9
Post fracture	167	6.3
Avascular necrosis	17	0.6
Instability	76	2.9
Other	136	5.1
Total in data set	**2,661**	**100.0**

TABLE 5.6

Not all procedures record a diagnosis; some may have more than one.

X-Ray	N	%
Concentric or mild deformity	435	61.5
>10 degrees varus	173	24.5
>10 degrees valgus	99	14.0
Total in data set	**707**	**100.0**
No alignment data recorded	**100**	

TABLE 5.7

Data on X-ray alignment has only been collected since the introduction of the new forms in November 2020. There are 807 new ankles registered using the new form. Not all procedures record alignment data.

Concurrent surgery	N
Achilles or calf lengthening	250
Ligament reconstruction – lateral	70
Hindfoot fusion or osteotomy	97
Midfoot fusion or osteotomy	85
No concurrent surgery recorded	305
Total in data set	**807**

TABLE 5.8

Details on concurrent surgery have only been collected since the introduction of the new forms in November 2020. There are 807 new ankles registered using the new form.

Approach	N
Anterior	2,235
Lateral	119
Anterolateral	54
No approach recorded	277
Total in data set	**2,685**

TABLE 5.9

Note the Anterolateral approach is no longer included in the current forms.

Surgical Adjuncts

With a view to the future, the November 2020 data form update included data about modern surgical adjuncts including Patient specific instrumentation, Navigation and Robotics. To date there have not been any procedures recording the use of robotics or navigation. There have been 121 procedures recorded as using patient specific instrumentation.

ASA Class

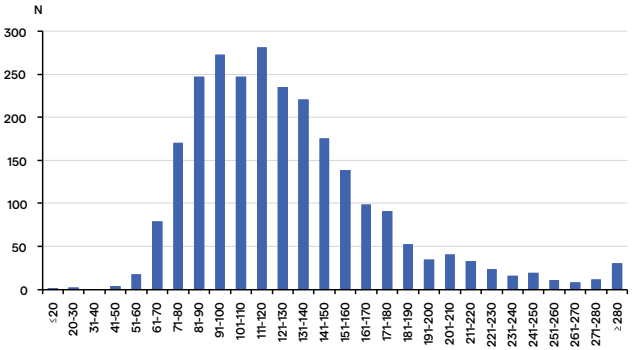
This was introduced with the updated forms at the beginning of 2005.

For the period 2005 -2024, there were 2,410 primary ankle procedures with the ASA class recorded.

ASA Class	N	%
1	373	15.5
2	1,533	63.6
3	496	20.6
4	8	0.3
Total	**2,410**	**100.0**

TABLE 5.10

Operative time (skin to skin minutes)



Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. The following figures are for the eighteen-year period 2005 -2024.

Surgeon grade	N	%
Consultant	2,648	98.7
Advanced trainee supervised	36	1.3
Advanced trainee unsupervised	0	0
Total	**2,684**	**100**

TABLE 5.11

Surgeon and hospital workload

Surgeons

In 2024, 30 surgeons performed 294 primary ankle procedures. 11 surgeons performed 10 or more procedures and 19 performed less than 10 procedures.

Hospitals

In 2024, primary ankle replacement was performed in 32 hospitals. 13 were public and 19 were private.

Ankle Prostheses used in 2024

The table and graph below report prosthesis usage by tibial component type.

Prosthesis	N
Inbone II	13
Infinity with Adaptis	178
Salto Talaris	3
Vantage Fixed Bearing	20
Vantage Mobile Bearing	43
Zimmer TM	37
Total	**294**

TABLE 5.12

The Inbone II appeared in use as a primary implant in 2023 It has been available in New Zealand since 2016 with a Patient specific implantation option from 2020. It has a fixed bearing. In November 2022 it was offered with a new modified polyethylene (Everlast, highly crosslinked Vitamin E infused).

The Infinity is a fixed bearing implant used in NZ from 2014 to 2023. It started with a plasma sprayed backing, used a fixed conventional polyethylene bearing and had the option of the infinity talus or Inbone II talus (flat cut) as the articular surface geometry is the same for the Infinity and Inbone II. From 2016 the Infinity had a Patient specific implantation option. In November 2022 the Infinity was discontinued by the supplier. The last two were implanted in 2023 and recorded in last year's registry report. The Infinity was replaced with the 'Infinity with Adaptis' which has a new backing surface (Adaptis) as well as a new modified polyethylene (Everlast, highly crosslinked Vitamin E infused). It was introduced in November 2022.

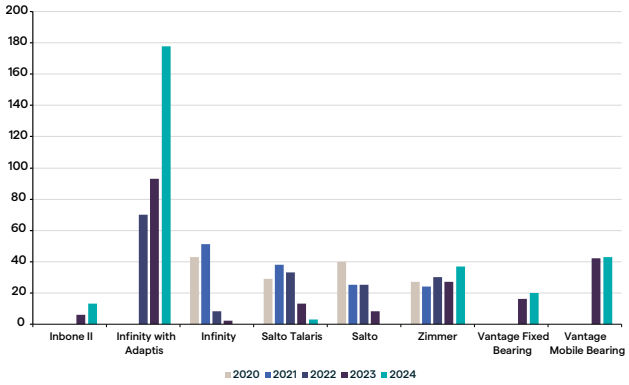
The Salto mobile bearing implant was in use in New Zealand from 2005 to 2023. It was not used in 2024 as the supplier discontinued it preferring to supply the Infinity with Adaptis. The Salto Talaris is based on the Salto but has a fixed bearing and has been in use in NZ since 2014. It has also been withdrawn from the market by the supplier, and the final 3 were implanted in 2024. Surgeons who previously used the Salto/Salto Talaris seem to have predominantly chosen to move to the Infinity with Adaptis or the Vantage (fixed or mobile).

The Vantage entered the New Zealand market in 2023, with both a mobile and a fixed bearing option. It has compression moulded polyethylene.

The Zimmer TM is a fixed bearing implant with highly crosslinked polyethylene implanted through a lateral approach with a fibular osteotomy and has been in use in NZ since 2014.

Ankle Tibial Prostheses Used for the Five Years 2020-2024

In a previous registry report a single Ossis implant was reported being implanted in 2021. This has not been included in the graph this year as it was a custom talar implant.



The Stryker ankle replacement range has multiple tibial and talar component options. They can be intermingled because they all share the same articular surface geometry. On the tibial side is the Infinity, Infinity with Adaptis, Inbone II and Invision tibial implants. On the talar side there is the Infinity, Infinity with Adaptis, Inbone II, Inbone II with Adaptis and Invision modular (revision) talar component. The different implants have become available at different times. The usage of the different possible tibial/talar combinations is summarised in the table on the right.

Implant types (date of introduction in NZ)

		Tibia				
		Infinity, plasma spray (2014)	Infinity with Adaptis (Nov 2022)	Inbone II (2016)	Invision (2021)	TOTALS
Talus	Infinity, plasma spray (2014)	303	0	0	0	**303**
	Infinity with Adaptis (2022)	0	267	1	0	**268**
	Inbone II, plasma sprayed (2016)	11	9	16	0	**36**
	Inbone II with Adaptis (AKA Adaptis flat cut talus, April 2024)	0	0	0	0	**0**
	Invision modular revision talus (2021)	0	0	2	0	**2**
	Totals	**314**	**276**	**19**	**0**	

TABLE 5.13

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 which are included in the category referred to as reoperation.

Data analysis

For the twenty-five-year period January 2000–December 2024, there were 280 revision ankle procedures registered. The average age for an ankle revision was 66 years, with a range of 35 – 87.

All Primary Ankle Arthroplasties

This section analyses data for revisions of primary ankle procedures for the twenty-five-year period 2000 – 2024. There were 280 revisions of the 2,685 primary total ankle procedures registered.

The average age at revision is slightly younger than the average age at primary arthroplasty. The average was 66 years with a range of 36-87 years.

	N	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
All patients	2,685	19,274.7	280	1.45	1.29	1.63

TABLE 5.14

Sex	N	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Females	1,062	7,736.3	112	1.45	1.19	1.74
Males	1,623	11,538.4	168	1.46	1.24	1.69

TABLE 5.15

Age Groups	N	Sum comp. Years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<55	243	2,048.9	53	2.59	1.92	3.36
55-64	801	6,317.9	127	2.01	1.68	2.39
65-74	1,133	7,963.9	86	1.08	0.86	1.33
>=75	508	2,943.9	14	0.48	0.26	0.80

TABLE 5.16

Ethnicity	N	Sum comp. Year	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Asian	26	202.6	4	1.97	0.42	5.05
Euro/Other	2,463	17,787.0	258	1.45	1.28	1.64
Māori	105	594.4	7	1.18	0.47	2.43
Pacifica	44	232.5	7	3.01	1.21	6.20

TABLE 5.17

Reason for revision

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	14	46.7
1	7	11.5	13	28.9	16	17.8	3	10.0
2	8	13.1	3	6.7	11	12.2	3	10.0
3	9	14.8	3	6.7	11	12.2	4	13.3
4	9	14.8	5	11.1	14	15.6	1	3.3
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	3.3
8	2	3.3	4	8.9	6	6.7	0	0.0
9	4	6.6	2	4.4	4	4.4	0	0.0
10	2	3.3	2	4.4	3	3.3	0	0.0
11+	5	8.2	3	6.7	4	4.4	4	13.3
Total	**61**		**45**		**90**		**30**	

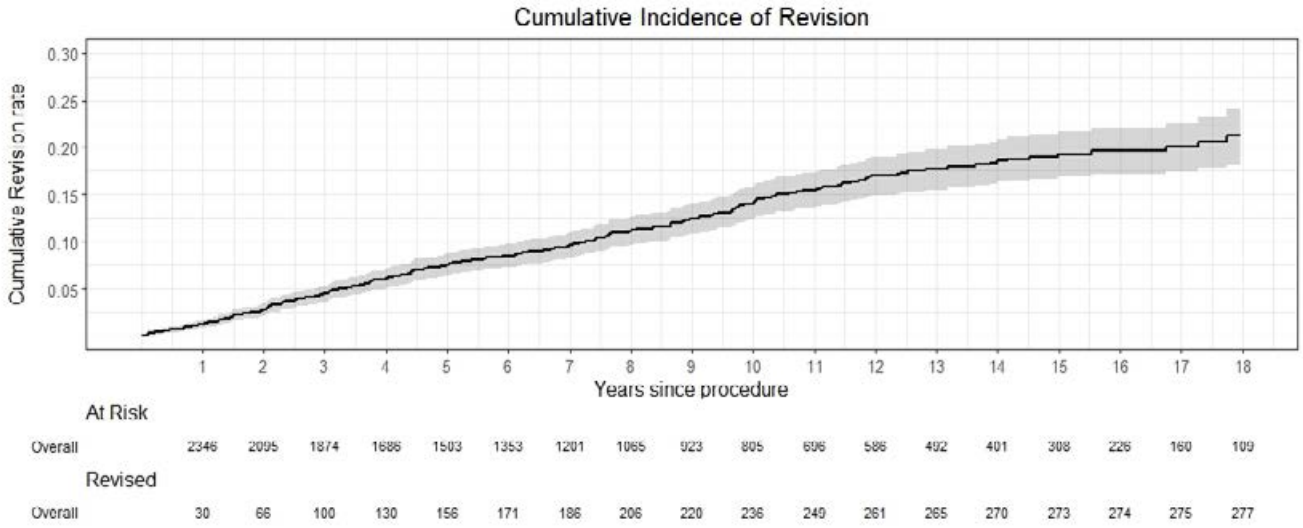
TABLE 5.18

* Pain was replaced with Pain with no obvious cause in the November 2020 data collection form.

Cumulative Revision Analyses

Cumulative Revision Analyses

Total ankle joint replacement cumulative incidence of revision, with 95% confidence intervals for the incidence of revision:



Kaplan Meier Survival Analysis

Years	% Revision-free	N
0	100.0	2,685
1	98.8	2,346
2	97.2	2,095
3	95.6	1,874
4	94.0	1,686
5	92.5	1,503
6	91.5	1,353
7	90.4	1,201
8	88.9	1,065
9	87.6	923
10	86.0	805
11	84.5	696
12	83.0	586
13	82.3	492
14	81.4	401
15	80.7	308
16	80.4	226
17	80.0	160
18	78.8	109
19	77.2	69
20	77.2	39

TABLE 5.19

Revision by Prosthesis Type

Tibial Prosthesis	N	Sum comp years	Events	Rate/ 100-comp. years	Lower 95% CI	Upper 95% CI
Inbone II	16	11.51	2	17.38	2.10	62.77
Box	6	56.83	3	5.28	1.09	15.43
Ramses	11	127.75	5	3.91	1.27	9.13
Hintegra	22	194.58	6	3.08	1.13	6.71
Agility	119	1536.26	38	2.47	1.75	3.40
STAR	47	539.79	12	2.22	1.08	3.77
Mobility	450	5333.39	78	1.46	1.15	1.81
Salto	862	7783.66	109	1.40	1.15	1.69
Infinity	307	1457.39	17	1.17	0.68	1.87
Infinity with Adaptis	275	227.84	2	0.88	0.05	3.17
Zimmer TM	203	685.06	4	0.58	0.12	1.39
Salto Talaris	233	1195.16	3	0.25	0.05	0.73
Vantage Fixed Bearing	36	30.34	0	0.00	0.00	12.16
Vantage Mobile Bearing	84	79.99	0	0.00	0.00	4.61

TABLE 5.20

Patient Recorded Outcome Measures

Ankle Re-Revisions

There were 31 registered primary ankle procedures that were revised twice and 4 procedures that were revised three times.

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.

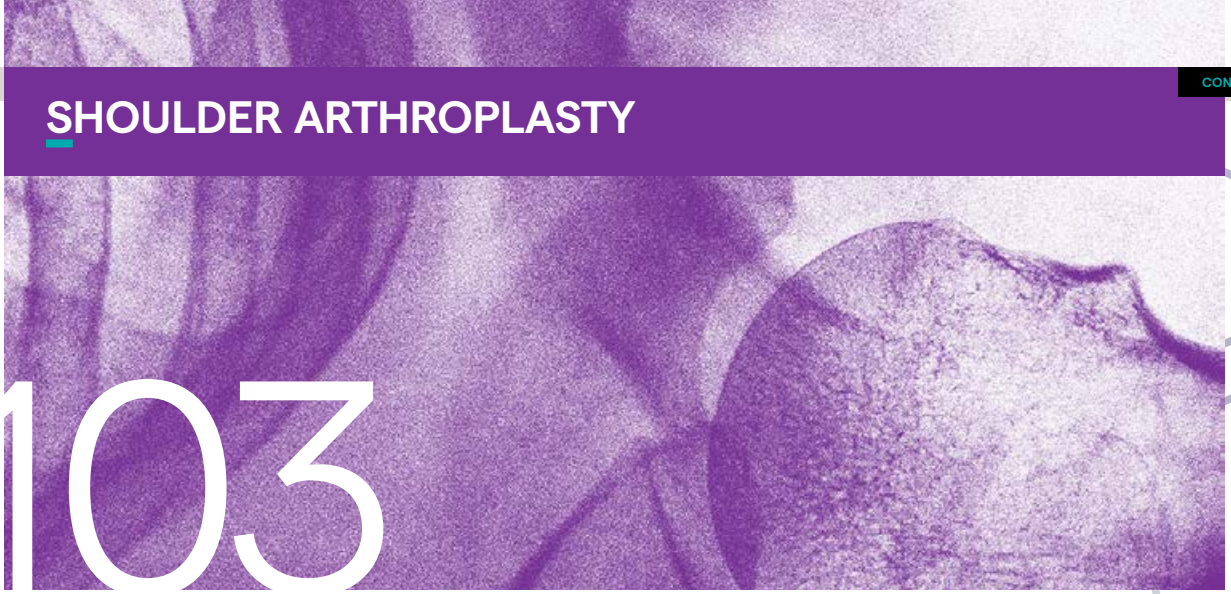
This has 16 questions answered on a 5- point Likert scale, with each item scoring from 0 – 4, with 4 denoting “most severe”. Total score ranges from 0-64, 0 is best possible, 64 is worst possible outcome.

The following survey responses have been collected since the change in survey instrument occurred.

	Oxford 6 Months	Oxford 5 Years
n	621	245
Minimum	0	0
Maximum	64	64
Mean	19.6	13.6

TABLE 5.21

SHOULDER ARTHROPLASTY



103

PRIMARY SHOULDER ARTHROPLASTY

The **twenty-six-year** report analyses data for the period January 2000 – December 2024.

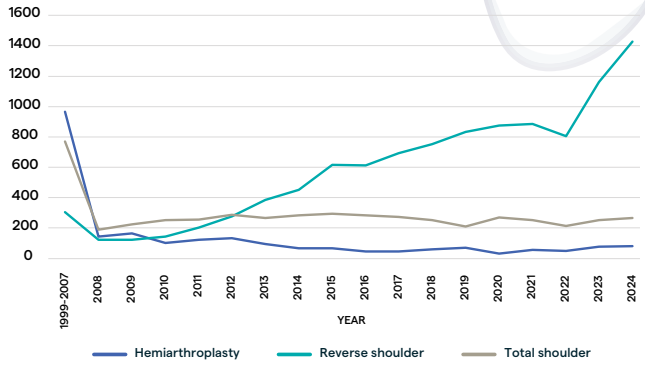
There were 18,141 shoulder procedures registered with 1,779 added in 2024.

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

These are total shoulder with 5,094 registered, reverse with 10,671 registered and hemiarthroplasty with 2,376 registered.

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

Shoulder Arthroplasty Type by Year



Data analysis

Data form analysis includes new form and legacy data.

Age and sex distribution

The average age for all patients with shoulder arthroplasty was 70.9years, with a range of 13.3 – 99.4. years

	Female			
	Mean	Minimum	Maximum	N (%)
Total shoulder	69.7	26.6	95.4	2,992
Reverse shoulder	74.6	15.7	96.8	6,487
Hemiarthroplasty	69.8	15.0	97.7	1,394

TABLE 6.1

	Male			
	Mean	Minimum	Maximum	N (%)
Total shoulder	65.1	13.3	89.1	2,102
Reverse shoulder	71.6	19.6	94.3	4,184
Hemiarthroplasty	61.1	19.1	99.4	982

TABLE 6.2

Ethnicity	Hemiarthroplasty	Reverse shoulder	Total shoulder
Asian	31	193	48
Euro/Other	2,089	8,808	4,508
Māori	102	406	202
NR	115	1,173	289
Pacifica	39	91	47

TABLE 6.3

Data analysis by Shoulder Arthroplasty Type

Previous operation	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
None	1,831	6,418	4,306
Rotator cuff repair	75	1,254	87
Internal fixation for Juxta articular fracture	101	196	55
Previous stabilisation	92	130	135
Arthroscopic debridement	19	75	67

TABLE 6.4

Diagnosis	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
Osteoarthritis	958	3,851	4,428
Rheumatoid arthritis/other inflammatory	225	442	282
Cuff tear arthropathy	222	4,120	32
Massive Cuff Tear without Arthritis	1	588	2
Acute fracture proximal humerus	516	1,130	19
Post old trauma	242	619	163
Avascular necrosis	159	201	110
Post recurrent dislocation	86	115	105

TABLE 6.5

Approach	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
Image Guided	0	128	45
Patient Specific Instrumentation	0	59	21
Deltopectoral	2,120	9,341	4,627

TABLE 6.6

Humeral stem type	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
NR	2,124	6,535	4,126
Short/metaphyseal stem	143	990	235
Standard	88	3,082	275
Stemless	21	64	458

TABLE 6.7

Glenoid Morphology	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
NR	2,149	6,639	4,134
A1	104	1,886	255
A2	40	971	265
B1	21	237	140
B2	37	546	243
B3	11	262	35
C	12	75	10
D	2	55	12

TABLE 6.8

ASA Class

ASA Class	Hemi-arthroplasty N (%)	Reverse Shoulder N (%)	Total Shoulder N (%)
1	220	559	506
2	906	5,776	2,843
3	571	3,967	1,214
4	17	122	24

TABLE 6.9

Mean Operative Time (skin to skin in minutes)

Mean Operative Time (skin to skin in minutes)	Mean (SD)
Total shoulder	123.6 (34.1)
Reverse shoulder	107.7 (41.0)
Hemiarthroplasty	108.3 (44.7)

TABLE 6.10

Surgeon grade

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

The following figures are for the eighteen-year period 2005 – 2024.

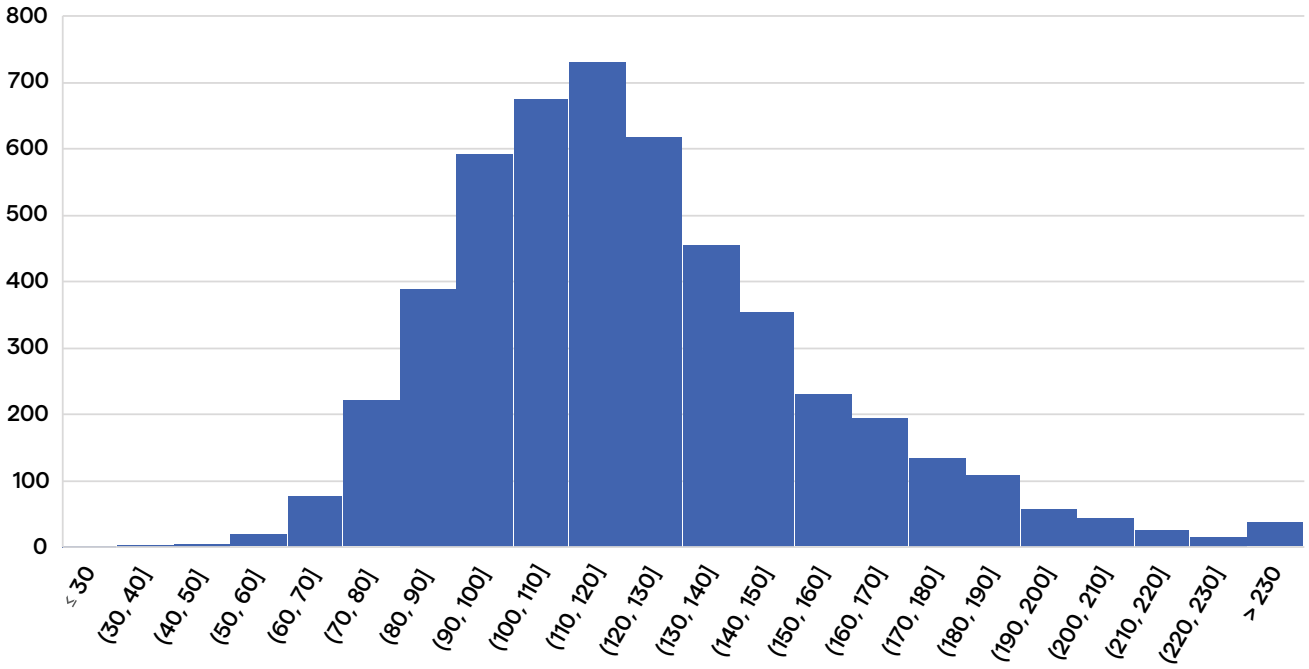
Surgeon grade	Hemi-arthroplasty	Reverse Shoulder	Total Shoulder
Consultant	1,649	8,663	4,268
Advanced trainee supervised	76	538	194
Advanced trainee unsupervised	15	25	7

TABLE 6.11

Surgeon and Hospital Workload	Total Shoulder	Reverse Shoulder	Hemi-arthroplasty
Hospitals	43	52	23
Operations	268	1,429	82
Public/Private	21/22	27/25	12/11
Consultants	58	86	25
Surgeons performing >=10 procedures	7	45	1

TABLE 6.12

Skin-to-Skin Time - Total Shoulder Arthroplasty



Average skin to skin time for total shoulder arthroplasty = 122 minutes

Prostheses Used In 2024

Reverse Shoulder Prostheses	N
SMR Reverse	495
Perform	212
Global Unite	207
Comprehensive	99
Univers Revers Stem	71
Equinoxe	49
Aequalis Reversed Fracture	45

TABLE 6.13

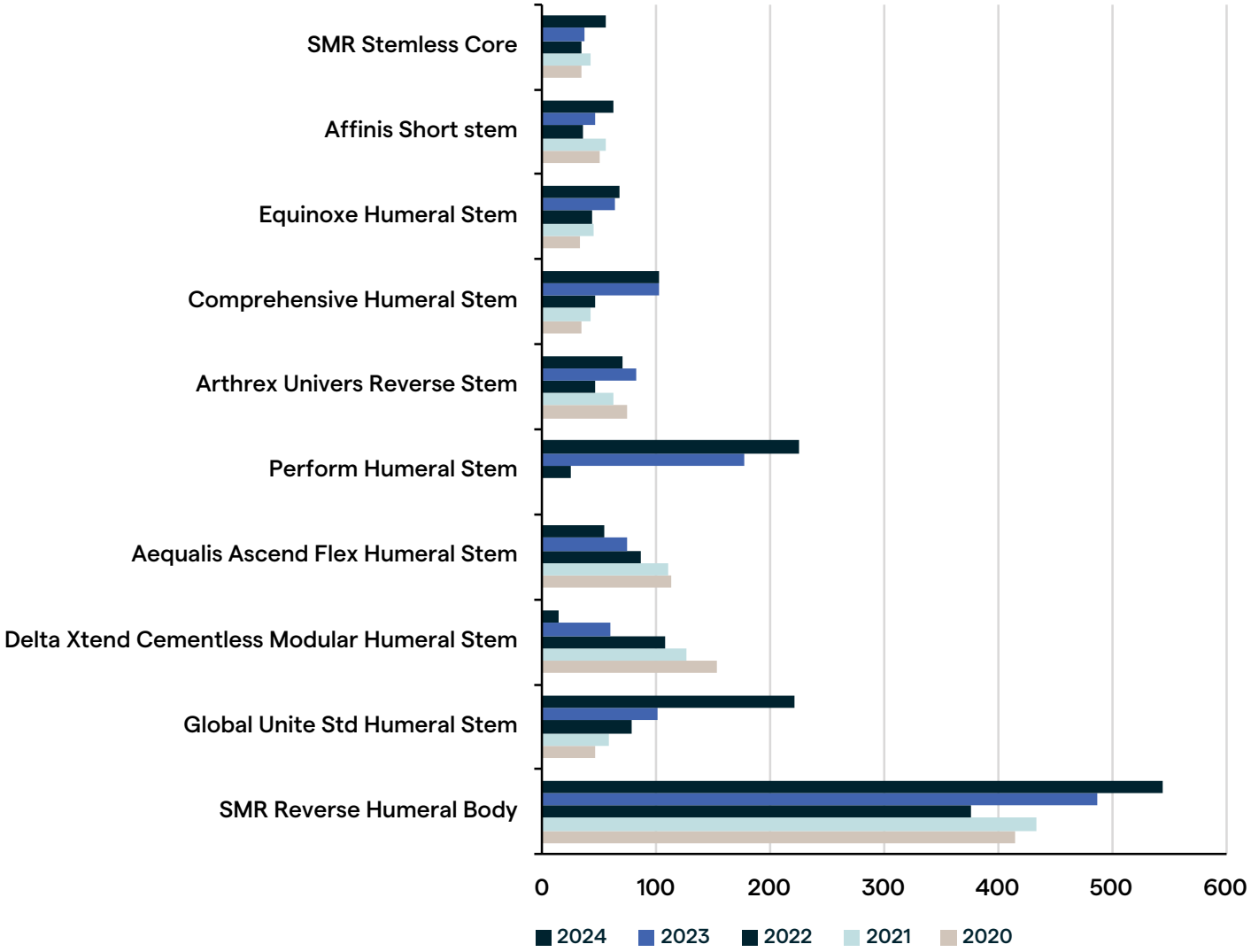
Total Shoulder Prostheses	N
Affinis	60
SMR Stemmed	50
SMR Stemless	48
Perform	25
Equinoxe	19
Simpliciti Nucleus	14
Mirai Humeral Core Standard	12
Global Unite Std	11
Arthrex Eclipse Trunnion	8

TABLE 6.14

Hemiarthroplasty	N
Aequalis Ascend Flex	57
SMR	9
Aequalis Flex Revive	4
Arthrex Eclipse	3
Global Unite	2
Affinis Short Stem	2
Aequalis Reversed Fracture	1

TABLE 6.15

Top 10 Shoulder Humerus Prostheses for the five years 2020 – 2024



Revision of 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-four-year period January 2000 – December 2024 there were 962 revisions of shoulder procedures registered.

There were 253 revisions of the hemiarthroplasty group of 2,376, 336 revisions of the reverse shoulder group of 10,671 and 373 revisions of the total shoulder group of 5,094. The average age for a shoulder revision was 69 years with a range of 33-91 years.

	Female	Male
Number	527	435
Percentage	54.8	45.2
Mean	70.7	67.9
Maximum age	91.3	88.5
Minimum age	33.2	36.7
Standard dev.	10.3	9.7

TABLE 6.16

This section analyses data for revisions of shoulder primary procedures for the twenty-five-year period January 2000 – December 2024.

For all primary shoulder procedures, there were 138 procedures that had been revised twice and 35 procedures that had been revised three times.

Time to revision - all shoulders

	Time
Average	1,664 days (4.6 years)
Maximum	7,939 days (21.7 years)
Minimum	0 days
Standard deviation	1,671 days (4.6 years)

TABLE 6.17

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

Reason for revision	Loosening glenoid		Dislocation		Deep infection		Rotator Cuff Impingement		Loosening Humeral	
	Count	%	Count	%	Count	%	Count	%	Count	%
0	28	18.2	84	62.2	38	31.7	7	12.7	9	24.3
1	20	13.0	17	12.6	29	24.2	7	12.7	4	10.8
2	16	10.4	5	3.7	16	13.3	4	7.3	5	13.5
3	10	6.5	5	3.7	8	6.7	5	9.1	3	8.1
4	9	5.8	5	3.7	8	6.7	3	5.5	3	8.1
5	5	3.2	6	4.4	4	3.3	3	5.5	4	10.8
6	10	6.5	2	1.5	3	2.5	4	7.3	0	0.0
7	3	1.9	4	3.0	3	2.5	4	7.3	0	0.0
8	6	3.9	3	2.2	4	3.3	0	0.0	2	5.4
9	11	7.1	0	0.0	2	1.7	2	3.6	3	8.1
10	6	3.9	1	0.7	1	0.8	2	3.6	1	2.7
11+	30	19.5	3	2.2	4	3.3	14	25.5	3	8.1
Total	**154**		**135**		**120**		**55**		**37**	

TABLE 6.18

All Total Arthroplasties

	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
All patients	18,141	115,414.1	962	0.834	0.78	0.89

TABLE 6.19

Revision rate by Sex

Sex	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
F	10,873	71,301.0	527	0.74	0.68	0.80
M	7,268	44,113.2	435	0.99	0.90	1.08

TABLE 6.20

Revision rate by Age groups

Age Group	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<55	1,078	7,861.0	136	1.73	1.45	2.04
55-64	3,338	22,898.2	303	1.32	1.18	1.48
65-74	7,046	46,689.5	347	0.74	0.67	0.83
>=75	6,679	37,965.5	176	0.46	0.40	0.54

TABLE 6.21

Revision rate by Ethnicity

Ethnicity	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Asian	272	1,842.4	8	0.43	0.17	0.86
Euro/Other	15,405	104,866.0	865	0.82	0.77	0.88
Māori	710	4,208.7	49	1.16	0.85	1.53
Pacifica	177	1,275.1	7	0.55	0.20	1.08

TABLE 6.22

Revision rate by Arthroplasty Type

Operation Type	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	2,376	21,949.2	253	1.15	1.01	1.30
Reverse shoulder	10,671	52,409.4	336	0.64	0.57	0.71
Total shoulder	5,094	41,055.6	373	0.91	0.82	1.00

TABLE 6.23

Revision rate by Age Group and Arthroplasty Type

Shoulder Type	Age Groups	N	Observed comp. years	N. Revised	Rate/100-component-years (95% CI)	Lower 95% CI	Upper 95% CI
Hemiarthroplasty	<55	462	4,249.5	73	1.72	1.34	2.15
	55-64	560	5,475.4	88	1.61	1.29	1.98
	65-74	647	6,596.3	61	0.92	0.71	1.19
	>=75	707	5,627.9	31	0.55	0.37	0.78
Reverse shoulder	<55	182	708.6	10	1.41	0.63	2.50
	55-64	1,402	6,531.3	77	1.18	0.93	1.47
	65-74	4,222	21,656.4	147	0.68	0.57	0.80
	>=75	4,865	23,513.2	102	0.43	0.35	0.53
Total shoulder	<55	434	2,903.0	53	1.83	1.35	2.37
	55-64	1,376	10,891.5	138	1.27	1.06	1.49
	65-74	2,177	18,436.8	139	0.75	0.63	0.89
	>=75	1107	8,824.4	43	0.49	0.35	0.65

TABLE 6.24

Revision by Number of Operations per year

Number of operations per year	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
<10	4,542	31,889.8	286	0.90	0.80	1.01
>=10	13,595	83,519.9	676	0.81	0.75	0.87

TABLE 6.25

Revision by cementation of Glenoids (from total shoulders)

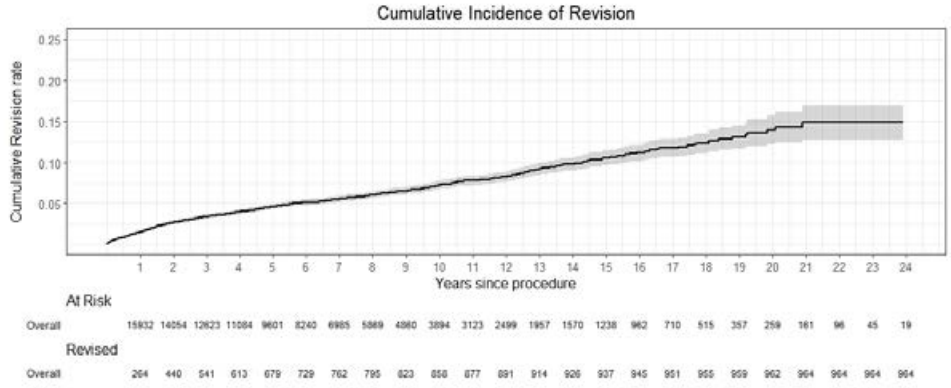
	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Uncemented	1,487	11,421.3	197	1.72	1.49	1.98
Cemented	3,607	29,634.3	176	0.59	0.51	0.69

TABLE 6.26

Cumulative Revision Analysis

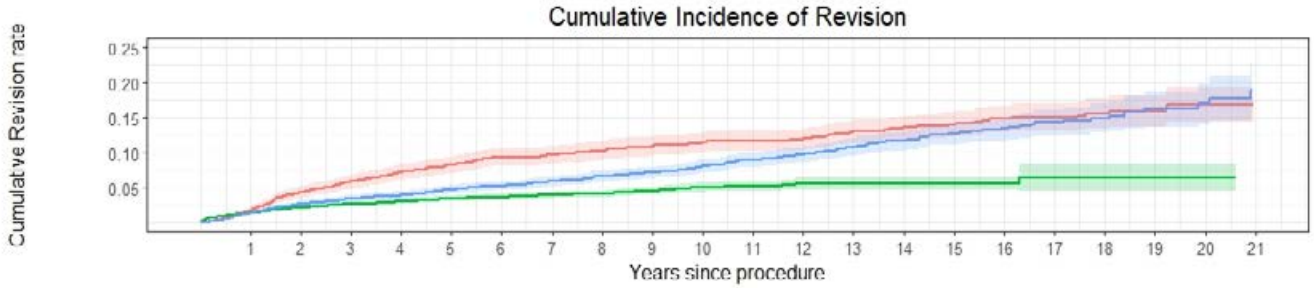
The following cumulative revision analyses are for the 25 years from 2000 to 2024, with deceased patients censored at time of death.

All shoulders



Cumulative Incidence of Revision for Different Arthroplasty Types

Survival Curves for Different Arthroplasty Types



At Risk

Hemiarthroplasty	2208	2033	1890	1746	1625	1479	1364	1249	1156	1032	913	803	670	589	506	414	328	258	192	144	92
Reverse shoulder	9001	7640	6652	5602	4599	3684	2884	2217	1633	1117	779	518	340	220	161	115	69	32	11	6	1
Total shoulder	4723	4375	4081	3736	3377	3077	2737	2403	2071	1745	1431	1178	939	753	571	433	313	225	154	109	68

Revised

Hemiarthroplasty	41	97	129	156	173	193	197	207	215	223	225	226	236	240	243	247	248	250	251	253	253
Reverse shoulder	148	211	249	274	293	304	312	317	325	333	335	337	337	337	337	337	338	338	338	338	338
Total shoulder	75	132	163	183	213	232	253	271	283	302	317	328	341	349	357	361	365	367	370	371	373

Revision Rate of Individual Shoulder Prostheses Sorted by Alphabetical Order

Hemiarthroplasty

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Aequalis Ascend Flex	322	1,312.1	11	0.84	0.42	1.50
Aequalis Cemented	59	812.1	6	0.74	0.27	1.61
Aequalis Flex Revive	7	7.6	1	13.22	0.33	73.65
Aequalis Fracture	39	308.6	4	1.30	0.35	3.32
Aequalis Press-Fit	46	489.4	6	1.23	0.45	2.67
Aequalis PTC	1	0.2	0	0.00	0.00	1643.13
Aequalis Reverse II	1	2.4	0	0.00	0.00	153.46
Aequalis Reversed Fracture	3	3.3	1	30.72	0.78	171.16
Affinis	1	5.7	0	0.00	0.00	64.62
Affinis Short	27	127.3	1	0.79	0.02	4.38
Anatomical	17	254.2	0	0.00	0.00	1.45
Anatomical	2	41.7	0	0.00	0.00	8.84
Arthrex Eclipse Trunnion	7	40.9	1	2.44	0.06	13.62
Arthrex Univers Reverse Stem	1	4.2	0	0.00	0.00	87.10
Ascend TM	1	6.9	0	0.00	0.00	53.62
Bi-Angular/Bi-Polar	19	240.7	2	0.83	0.10	3.00
Bigliani/Flatow Modular Stem	134	1,615.3	14	0.87	0.47	1.45
Bigliani/Flatow Trabecular Metal Stem	3	28.0	1	3.58	0.09	19.92
Bio-modular	1	7.1	1	14.00	0.35	78.03
Cofield2	50	663.2	3	0.45	0.09	1.32
Comprehensive	4	20.3	0	0.00	0.00	18.16
Delta Cemented Humeral Diaphysis	36	215.8	4	1.85	0.51	4.75
Epoca	1	6.8	0	0.00	0.00	54.39
Equinox	1	4.0	0	0.00	0.00	93.18
Global Advantage	450	5,405.4	36	0.67	0.47	0.92

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Global AP	97	826.9	7	0.85	0.30	1.66
Global FX	244	2,390.8	26	1.09	0.69	1.57
Global	29	288.0	2	0.69	0.08	2.51
Global Icon	1	6.8	0	0.00	0.00	54.07
Global Unite	69	392.7	17	4.33	2.52	6.93
Hemicap Resurfacing	4	14.1	0	0.00	0.00	26.07
Latitude	1	4.1	0	0.00	0.00	90.18
MRS Humeral	4	24.9	0	0.00	0.00	14.79
Neer II	24	269.2	0	0.00	0.00	1.37
Osteonics	42	419.2	2	0.48	0.06	1.72
Randelli	1	8.2	0	0.00	0.00	44.82
Simpliciti Nucleus	3	19.5	0	0.00	0.00	18.96
SMR	416	3,521.0	63	1.79	1.37	2.29
SMR Stemless	4	11.1	0	0.00	0.00	33.29
Tornier Flex	31	10.3	0	0.00	0.00	35.81
Univers 3D	1	3.8	0	0.00	0.00	96.59
Univers Apex	2	7.9	0	0.00	0.00	46.73

TABLE 6.27

Reverse shoulder

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years (95% CI)	Lower 95% CI	Upper 95% CI
Aequalis Ascend Flex	667	3,708.0	29	0.78	0.52	1.12
Aequalis Flex Revive	19	36.3	1	2.76	0.07	15.36
Aequalis Reverse II	237	1,531.4	8	0.52	0.23	1.03
Aequalis Reversed Fracture	179	566.4	2	0.35	0.04	1.28
Affinis Fracture Inverse Stem	70	260.5	5	1.92	0.62	4.48
AltiVate Reverse	50	35.6	0	0.00	0.00	10.35

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years (95% CI)	Lower 95% CI	Upper 95% CI
Arthrex Eclipse Trunnion	1	1.8	0	0.00	0.00	209.54
Arthrex Univers Reverse Stem	374	987.2	4	0.41	0.09	0.96
Comprehensive Humeral Fracture Stem	22	52.5	1	1.91	0.00	10.62
Comprehensive	512	1,840.5	9	0.49	0.22	0.93
Delta Cemented Humeral Diaphysis	55	553.5	2	0.36	0.04	1.31
Delta Xtend Cementless Modular	2,283	15,198.1	104	0.68	0.56	0.83
Equinoxe	235	622.9	12	1.93	1.00	3.37
Global Unite	397	576.9	10	1.73	0.83	3.19
Inhance Short Stem	1	1.6	0	0.00	0.00	226.83
Mirai Humeral Core	24	55.7	2	3.59	0.19	11.52
Mirai Humeral Core Cage	10	6.9	1	14.56	0.37	81.11
Mirai Press-Fit	15	31.2	0	0.00	0.00	11.82
MUTARS	1	5.3	0	0.00	0.00	69.13
Perform Humeral Stem	430	431.5	9	2.09	0.95	3.96
Prima Stem	53	54.0	1	1.85	0.05	10.32
RSP Monoblock Stem	2	9.8	0	0.00	0.00	37.47
SMR Reverse	4,843	25,071.6	127	0.51	0.42	0.60
SMR Stemless Core	75	375.1	4	1.07	0.29	2.73
Stanmore Implants	1	2.1	1	47.93	1.21	267.07
Tornier	2	0.4	0	0.00	0.00	983.48
Tornier Perform	29	9.9	0	0.00	0.00	37.31
Trabecular Metal Reverse	72	400.5	2	0.50	0.06	1.80
Vaios	1	11.2	0	0.00	0.00	32.86
Zimmer Trabecular Metal	4	15.5	0	0.00	0.00	23.86

TABLE 6.28

Total shoulder

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Aequalis Ascend Flex	377	2,666.0	12	0.45	0.23	0.79
Aequalis Cemented	408	4,926.9	29	0.58	0.34	0.96
Aequalis Press-Fit	172	1,988.8	13	0.65	0.35	1.12
Affinis	359	1,342.6	6	0.45	0.16	0.97
AltiVate Reverse	8	18.7	0	0.00	0.00	19.76
Anatomical Cemented	29	428.3	2	0.47	0.06	1.69
Anatomical	2	25.1	0	0.00	0.00	14.67
Anatomical Uncemented	4	72.8	0	0.00	0.00	5.07
Arthrex Eclipse	42	125.3	1	0.80	0.02	4.45
Ascend	2	12.9	0	0.00	0.00	28.67
Bi-Angular/Bi-Polar	8	53.9	0	0.00	0.00	6.85
Bigliani/Flatow Modular Stem	310	3,832.3	14	0.37	0.20	0.61
Cofield2	21	276.4	0	0.00	0.00	1.33
Comprehensive	98	468.0	5	1.07	0.35	2.49
Delta Xtend	16	46.9	0	0.00	0.00	7.87
Epoca	4	45.8	0	0.00	0.00	8.05
Equinoxe	72	164.7	2	1.21	0.15	4.39
Global Advantage	501	6,015.1	36	0.60	0.42	0.83
Global AP	555	5,450.5	24	0.44	0.28	0.66
Global Icon	13	61.0	2	3.28	0.18	11.83
Global Unite	354	1,969.0	17	0.86	0.50	1.38
Mirai	74	181.9	3	1.65	0.34	4.82
MUTARS	1	4.2	0	0.00	0.00	87.60
Neer 3	2	34.4	0	0.00	0.00	10.72
Neer II	12	166.7	1	0.60	0.02	3.34
Osteonics	49	591.5	10	1.69	0.81	3.11

Prosthesis	N	Observed comp. years	N Revised	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Perform	6	7.7	0	0.00	0.00	48.15
Prima Stem	6	7.7	0	0.00	0.00	48.15
Sidus	1	10.3	0	0.00	0.00	35.72
Simpliciti Nucleus	170	733.0	3	0.41	0.08	1.20
SMR Stemless	258	940.0	12	1.28	0.62	2.16
SMR	1,169	9,854.9	193	1.96	1.69	2.26
Tornier Flex	1	0.0	0	0.00	0.00	9,624.02
Trabecular Metal Reverse Stem	1	10.5	0	0.00	0.00	35.23
Univers 3D	5	28.2	0	0.00	0.00	13.09
Univers Apex	34	141.2	0	0.00	0.00	2.61
Univers II	1	1.6	1	62.87	1.59	350.27

TABLE 6.29

Patient Recorded Outcome Measures

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 0. 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
1	>41	Poor
2	34 – 41	Fair
3	27 – 33	Good
4	< 27	Excellent

TABLE 6.30

For the twenty-five-year period and as 31 December 2024, there were 9,397 shoulder questionnaire responses registered at six months post-surgery.

The average shoulder score was 36.6 (standard error 0.1, range 0 – 48)

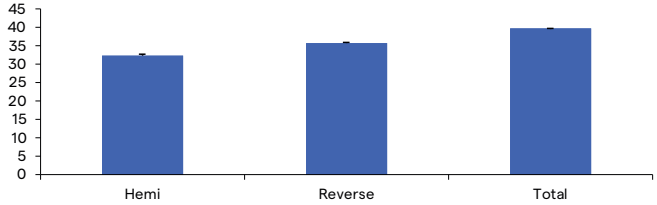
At six months post-surgery, 70% had an excellent or good score.

6-month Oxford Scores

Operation types	N	Mean	Std Error	Lower 95% CI	Upper 95% CI
Hemi	1,280	32.4	0.3	31.9	33.0
Reverse	5,075	35.9	0.1	35.6	36.1
Total	3,042	39.6	0.1	39.4	39.9
Total Procedures	**9,397**	**36.6**	**0.1**	**36.4**	**36.8**

TABLE 6.31

Oxford score at 6 months by shoulder operation



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 3,428 individual patients.

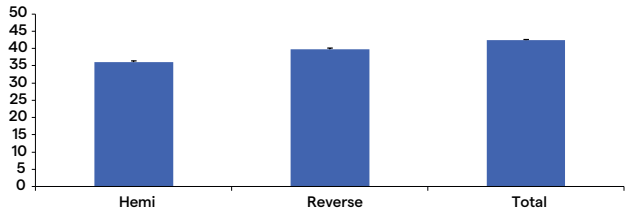
At five years post-surgery, 81% of these patients achieved an excellent or good score and had an average of 40.2.

5 Year Oxford Scores

Operation types	N	Mean	Std Error	Lower 95% CI	Upper 95% CI
Hemi	572	36.1	0.4	35.3	36.9
Reverse	1,479	39.8	0.2	39.4	40.3
Total	1,377	42.4	0.2	42.0	42.8
Total Procedures	**3,428**	**40.2**	**0.1**	**40.0**	**40.5**

TABLE 6.32

Oxford score at 5 Years by shoulder operation



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 1,269 individual patients.

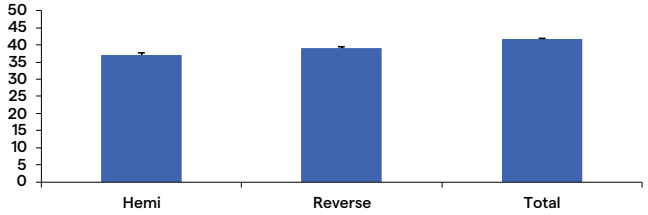
At ten years post-surgery, 79% of these patients achieved an excellent or good score and had an average of 40.1.

Ten Year Oxford Scores

Operation types	N	Mean	Std Error	Lower 95% CI	Upper 95% CI
Hemi	313	37.2	0.5	36.1	38.2
Reverse	310	39.5	0.5	38.5	40.4
Total	646	41.8	0.3	41.2	42.4
Total Procedures	**1,269**	**40.1**	**0.2**	**39.6**	**40.5**

TABLE 6.33

Oxford score at 10 Years by shoulder operation



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 361 individual patients.

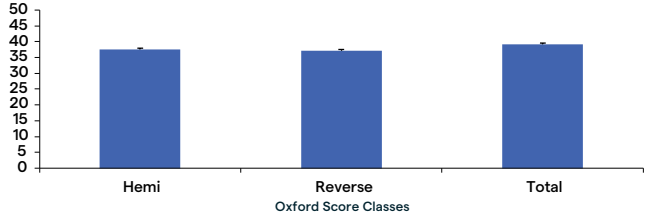
At fifteen years post-surgery, 74% of these patients achieved an excellent or good score and had an average of 38.3.

Fifteen Year Oxford Scores

Operation types	N	Mean	Std Error	Lower 95% CI	Upper 95% CI
Hemi	140	37.4	0.8	35.9	39.0
Reverse	39	37.1	1.9	33.3	40.9
Total	182	39.2	0.6	37.9	40.5
Total Procedures	**361**	**38.3**	**0.5**	**37.3**	**39.3**

TABLE 6.34

Oxford score at 15 Years by shoulder operation



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

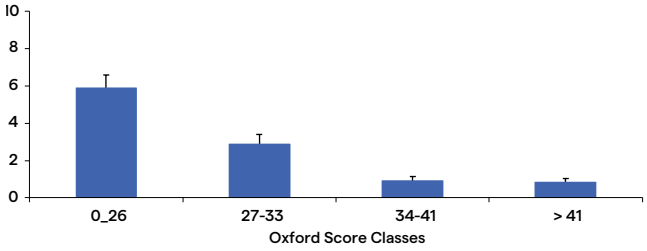
Plotting the patients' six-month scores in the Kalairajah groupings against the proportion of shoulders revised for that same group demonstrates that there is an incremental increase in risk during the next two years related to the Oxford score. A patient with a score below 27 has 6 times the risk of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

Kalairajah groupings of Oxford scores and Revision Risk within two years of the six- month score

Kalairajah Classification at 6 months	Revision to 2 years	N. revised	%	Std error
Poor	1,278	77	6.03	0.67
Fair	1,247	37	2.97	0.48
Good	2,750	27	0.98	0.19
Excellent	3,184	29	0.91	0.17

TABLE 6.35

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

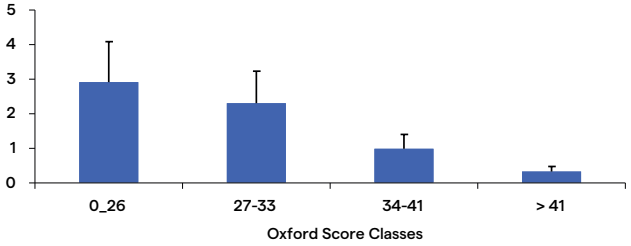


Kalairajah groupings of Oxford scores and Revision Risk within two years of the five-year score

Kalairajah Classification	Revision to 2 years	N. revised	%	Std error
Poor	221	6	2.71	1.09
Fair	278	6	2.16	0.87
Good	667	6	0.90	0.37
Excellent	1,665	5	0.30	0.13

TABLE 6.36

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

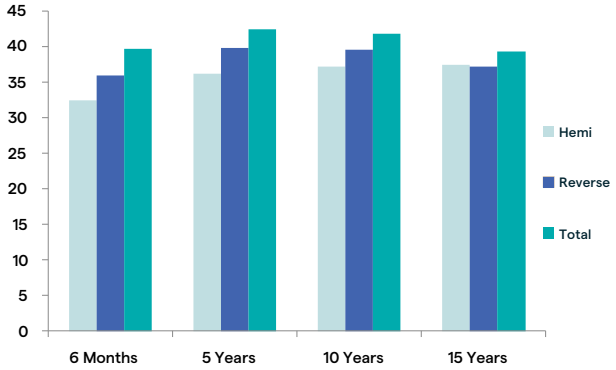


Six Month, Five, Ten- and Fifteen Year Oxford Scores by Arthroplasty Type

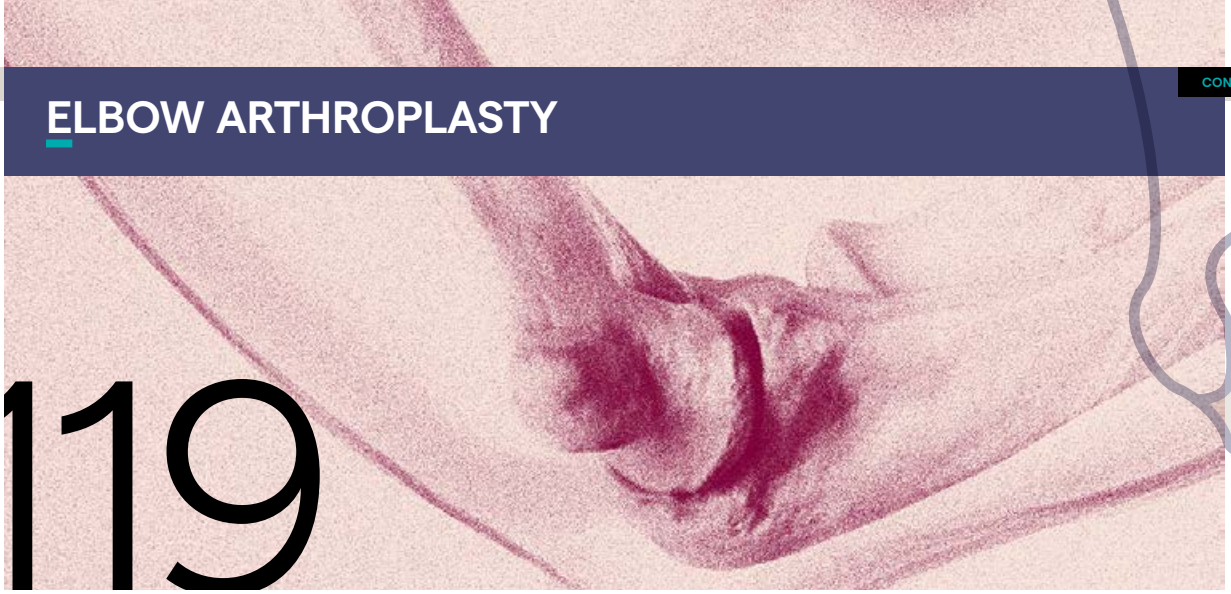
Arthroplasty Type	Time from Surgery	Mean	Std Error	Lower 95% CI	Upper 95% CI
Hemi	6 Months	32.41	0.28	31.87	32.95
	5 Years	36.11	0.41	35.30	36.91
	10 Years	37.16	0.54	36.11	38.21
	15 years	37.43	0.78	35.88	38.97
Reverse	6 Months	35.88	0.13	35.62	36.14
	5 Years	39.82	0.23	39.37	40.26
	10 Years	39.47	0.48	38.52	40.41
	15 years	37.13	1.88	33.33	40.92
Total	6 Months	39.64	0.15	39.36	39.93
	5 Years	42.43	0.19	42.05	42.80
	10 Years	41.77	0.31	41.17	42.38
	15 years	39.21	0.65	37.94	40.49

TABLE 6.37

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



ELBOW ARTHROPLASTY



119

PRIMARY ELBOW ARTHROPLASTY

The **twenty-six-year** report analyses data for the period January 2000 – December 2024. There were 930 primary elbow procedures registered.

Data analysis

Age and sex distribution

The average age for an elbow replacement was 66.4 years, with a range of 14 – 95 years.

	Age			
	Mean	Minimum	Maximum	N (%)
Female	67.6	25.5	92.4	699
Male	62.9	13.9	94.6	231
Total	**66.4**	**13.9**	**94.6**	**930**

TABLE 7.1

Ethnicity	N	%
Asian	37	3.4
Euro/Other	805	87.5
Māori	60	6.5
Pacifica	18	2.0

TABLE 7.2

BMI	N	%
< 19	10	3.7
19 - 24	85	31.1
25 - 29	82	30.0
30 - 39	74	27.1
40+	22	8.1

TABLE 7.3

Previous operation	N	%
None	772	83.0
Internal fixation	57	6.1
Osteotomy	3	0.3
Ligament reconstruction	10	1.1
Synovectomy	27	2.9
Debridement	29	3.1

TABLE 7.4

Diagnosis	N	%
OA	121	13.0
RA	355	38.2
Fracture NOF	423	45.5
Dysplasia	20	2.2
Dislocation	25	2.7

TABLE 7.5

Approach	N
Posterior	569
Medial	115
Lateral	136

TABLE 7.6

ASA Class

For the twenty- year period 2005 – 2024, there were 773 primary elbow procedures with the ASA class recorded.

ASA Class	N	%
1	67	8.7
2	357	46.2
3	335	43.3
4	14	1.8

TABLE 7.7

Operative time (skin to skin)

Operative time (minutes)	N	%
< 45	27	3.0
45 - 59	19	2.1
60 - 74	16	1.8
75 - 89	39	4.3
90 - 104	53	5.8
105 - 119	103	11.4
120 - 149	267	29.4
150 - 179	198	21.8
180+	185	20.4
Total	**907**	**100.0**

TABLE 7.8

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 – 2024.

Surgeon grade	N	%
Consultant	868	93.3
Advanced Trainee Supervised	33	3.5
Advanced Trainee UnSupervised	17	1.8

TABLE 7.9

Surgeon and hospital workload

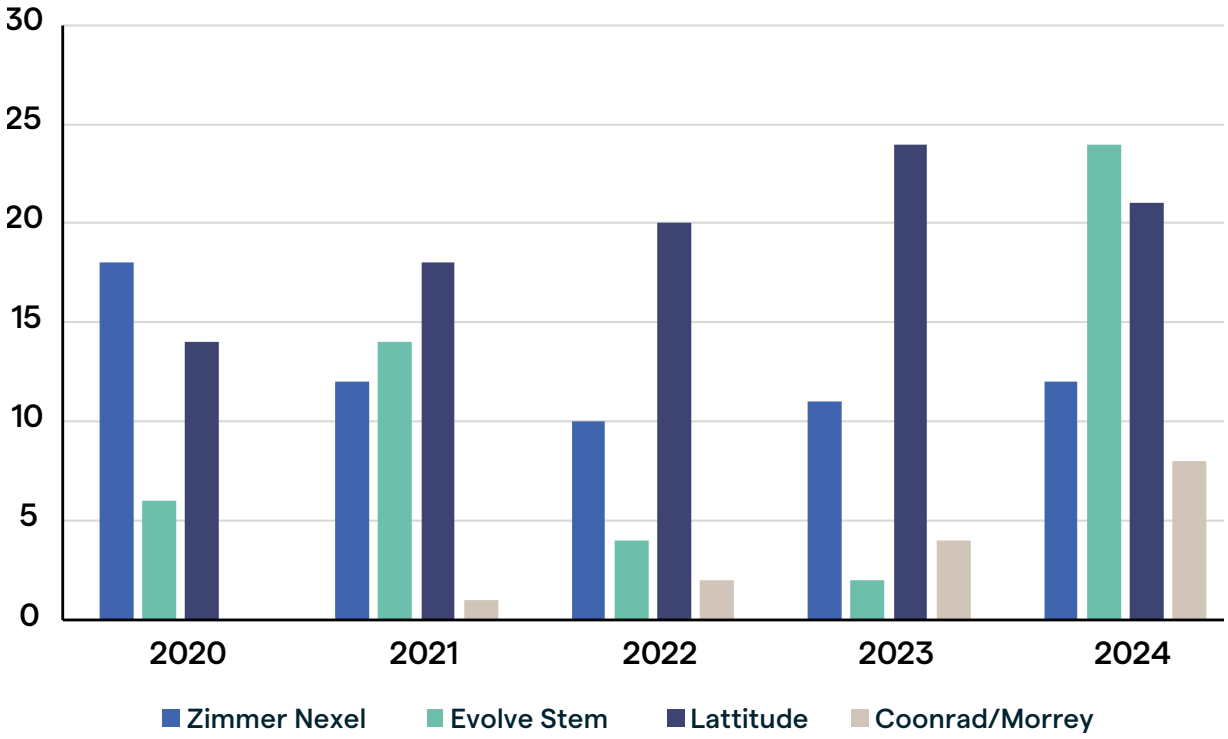
In 2024, 42 surgeons performed 79 primary elbow procedures. These ranged from 1 (n=22) and 2-5 (n=20) procedures performed per surgeon.

Hospitals

In 2024, primary elbow replacement was performed in 22 hospitals, of which 16 were public and 6 were private.

Prostheses

Most Used Elbow Prostheses for Five Years 2020-2024



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. removal of components and insertion of a cement spacer for infection) are all recorded as revisions.

Data analysis

For the twenty-five-year period January 2000 – December 2024, there were 73 revision elbow procedures registered.

The average age for a revision elbow replacement was 65.4 years, with a range of 22.4 – 90.4 years.

	Female	Male
Number	47	26
Percentage	64.3	35.7
Mean	67.4	65.6
Maximum age	83.0	90.4
Minimum age	46.4	22.4
Standard dev.	13.1	14.1

TABLE 7.10

Revision of Registered Primary Elbow Arthroplasties

This section analyses data for revisions of primary elbow procedures for the twenty-five-year period January 2000 – December 2024.

There were 73 revisions of the registered primary arthroplasty group of 930.

All Primary Total Elbow Replacements

	N	Sum. comp. years	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
All patients	930	6441.4	73	1.13	0.89	1.42

TABLE 7.11

Sex	N	Sum. comp. years	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Females	699	5077.2	47	0.93	0.68	1.23
Males	231	1364.2	26	1.91	1.24	2.79

TABLE 7.12

Age Groups	N	Sum. comp. years	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
<55	178	1365.0	21	1.54	0.92	2.31
55-64	218	1812.8	20	1.10	0.67	1.70
65-74	266	1863.5	20	1.07	0.66	1.66
>=75	268	1400.1	12	0.86	0.44	1.50

TABLE 7.13

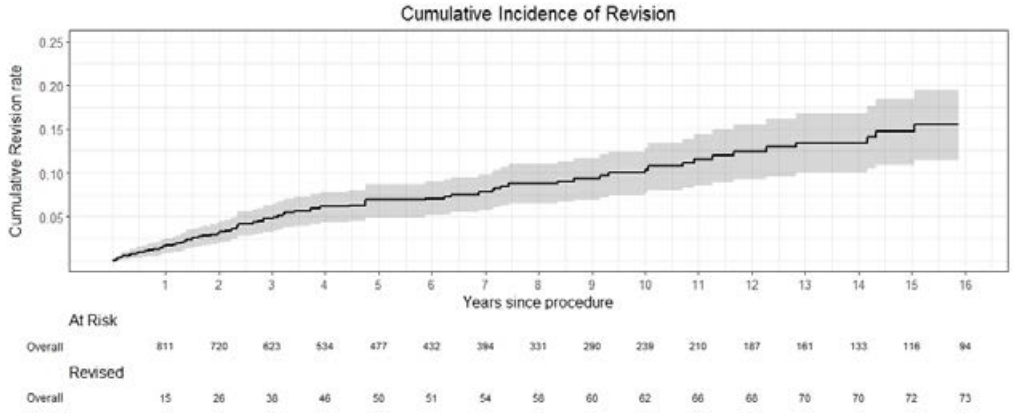
Ethnicity	N	Sum. comp. years	Events	Rate/ 100-comp. years	Lower (95% CI)	Upper (95% CI)
Asian	37	279.9	1	0.36	0.00	1.99
Euro/Other	805	5544.6	57	1.03	0.77	1.32
Māori	60	371.1	11	2.96	1.48	5.30
Pacifica	18	192.4	2	1.04	0.13	3.76

TABLE 7.14

Prosthesis	N	Sum comp. years	Events	Rate/100-component-years	Lower 95% CI	Upper 95% CI
Acclaim total elbow prosthesis	16	188.8	7	3.71	1.49	7.64
Align radial head	3	5.3	1	18.83	0.48	104.90
Anatomic radial head	1	4.0	0	0.00	0.00	93.18
Coonrad-Morrey total elbow prosthesis	362	3535.2	22	0.62	0.39	0.94
Custom radial head	1	3.1	0	0.00	0.00	120.30
Evolve radial head	77	338.5	2	0.59	0.07	2.13
Kudo total elbow prosthesis	18	196.0	4	2.04	0.56	5.23
Lattitude EV total elbow prosthesis	132	398.3	13	3.26	1.74	5.58
Lattitude distal humeral hemi-arthroplasty	75	784.8	12	1.53	0.79	2.67
Mutars Humerus Stem	1	8.9	0	0.00	0.00	41.66
Sorbie Questor Stemmed Humeral Component	1	6.8	0	0.00	0.00	54.09
Stanmore custom implant	1	14.3	1	6.98	0.18	38.90
Zimmer Nexel total elbow prosthesis	172	826.47	10	1.21	0.58	2.23

TABLE 7.15

The following cumulative revision analyses are for the 24 years from 2000 to 2024 with deceased patients censored at time of death.



Years	% Revision-free	N
1	98.3	811
2	96.9	720
3	95.2	623
4	93.9	534
5	93.1	477
6	92.9	432
7	92.2	394
8	91.3	331
9	90.7	290
10	90.0	239
11	88.4	210
12	87.5	187
13	86.5	161
14	86.5	133
15	85.2	116
16	84.5	94
17	84.5	70
18	84.5	54
19	84.5	44
20	84.5	32

TABLE 7.16

Reason for revision	Loosening humeral		Loosening Ulna		Deep Infection	
Years since operation	**Count**	**%**	**Count**	**%**	**Count**	**%**
0	1	4.2	2	9.5	6	31.6
1	2	8.3	1	4.8	4	21.1
2	5	20.8	6	28.6	3	15.8
3	4	16.7	4	19.0	1	5.3
4	2	8.3	0	0.0	1	5.3
5	1	4.2	0	0.0	0	0.0
6	1	4.2	1	4.8	1	5.3
7	2	8.3	1	4.8	0	0.0
8	1	4.2	1	4.8	1	5.3
9	1	4.2	2	9.5	0	0.0
10	1	4.2	2	9.5	0	0.0
11+	3	12.5	1	4.8	2	10.5
Total	**24**		**21**		**19**	

TABLE 7.17

Patient Recorded Outcome Measures

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

Questionnaires are repeated at 5, 10, 15 and 20 years for those individuals who have a response recorded at 6 months.

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.

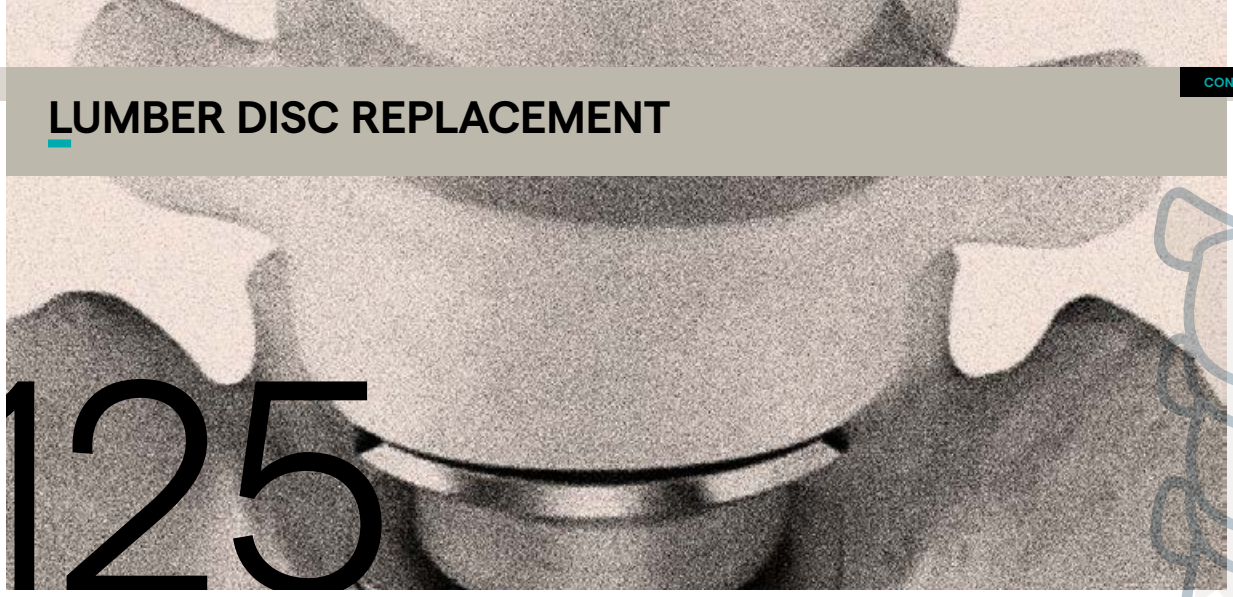
Total score range 0-48

The following survey responses have been collected since the change in survey instrument occurred.

	Oxford 6 Months	Oxford 5 Years	Oxford 10 Years	Oxford 15 Years
n	189	51	35	32
Minimum	0	12	2	15
Maximum	48	48	48	48
Mean	32.4	42.0	38.0	37.7

TABLE 7.18

LUMBER DISC REPLACEMENT



125

PRIMARY LUMBAR DISC REPLACEMENT

This report analyses data for the period January 2002 – December 2024.

There were 352 lumbar disc replacements registered.

Data analysis

	Age			
	Mean (SD)	Minimum	Maximum	N (%)
Female	39.7 (8.7)	21.8	62.2	143 (40.6)
Male	39.3 (8.5)	20.9	70.3	209 (59.4)

TABLE 8.1

Disc replacement levels	N
L3/4	5
L4/5	21
L5/S1	38
Other	23

TABLE 8.2

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

TABLE 8.3

Previous operation	N
Discectomy	41
L3/4	1
L4/5	27
L5/S1	42

TABLE 8.4

Diagnosis

Degenerative disc disease	N
L3/4	8
L4/5	35
L5/S1	52

TABLE 8.5

Annular tear MRI scan	N
L3/4	9
L4/5	63
L5/S1	16

TABLE 8.6

Discogenic pain on discography	N
L3/4	15
L4/5	109
L5/S1	51

TABLE 8.7

Approach	N
Retroperitoneal midline	303
Retroperitoneal lateral	4
Transperitoneal	21
Other	5

TABLE 8.8

Intraoperative complications	N
Damage to major veins	13
Subsidence	1

TABLE 8.9

Operative time (skin to skin)	N
Mean	113 minutes (104.9)
Range	27-284 minutes
Standard deviation	52 minutes

TABLE 8.10

Surgeon grade	N
Consultant	286

TABLE 8.11

Revision of registered Primary Lumbar Disc Replacements

There has been no change in the number of revisions.

There has been no change in the number of revisions.

There were 6 revisions of the primary group of 286 lumbar disc replacements.

Time to revision	Days
Mean	1,841 days (5.0 years)
Maximum	4,528 days (12.4 years)
Minimum	242 days

TABLE 8.12

Reason for revision	N
Loosening of Component	2
Loss of Alignment	1
Pain	2

TABLE 8.13

CERVICAL DISC REPLACEMENT

127

CERVICAL DISC REPLACEMENT

This report analyses data for the period January 2004 – December 2024.

There were 1,234 primary cervical disc replacements.

Data analysis

Age

	Age			
	Mean	Minimum	Maximum	N (%)
Female	46.8	19.0	73.3	552 (45)
Male	46.0	21.1	73.1	682 (55)

TABLE 9.1

Disc replacement levels	N
C3/4	24
C4/5	103
C5/6	562
C6/7	594
C7T1	23

TABLE 9.2

Previous operation	N
Foraminotomy	28
Adjacent level fusion	61
Adjacent level disc arthroplasty	19

TABLE 9.3

Diagnosis	N
Acute disc prolapse	824
Chronic spondylosis	258
Neck pain	53

TABLE 9.4

Approach	N
Anterior right	809
Anterior left	264

TABLE 9.5

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

TABLE 9.6

Operative time (skin to skin)	N
Average	91 minutes
Range	70-168 minutes
Standard Deviation	45.4 minutes

TABLE 9.7

Surgeon grade	N
Consultant	1,226
Advanced trainee supervised	4

TABLE 9.8

Revision of Cervical disc arthroplasties

There were 7 revisions registered.

Reason for revision	N
Failure of Component	2
Adjacent level surgery	1
Additional decompression required	1

TABLE 9.9

Revisioon	N
Replace disc prosthesis (same)	1
Fuse	8

TABLE 9.10

Time to revision	Days
Mean	2055 days (5.6 years)
Maximum	8025 days (21.9 years)
Minimum	322 days

TABLE 9.11

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 (total scored)/50(total possible score) x 100 = 32%

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

Example

Example: 16 (total scored)/45(total possible score) x 100 = 35.5%

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

Neck Disability Index	(N=339)
Range	0-82
Mean	17
Standard Deviation	16.6

TABLE 9.12

APPENDIX 1

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

APPENDIX 2 – CONSENT FORMS

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	Ioe	Leai
Tongan	Oku ou fiema'u ha fakatonulea	Io	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, e.g., 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: jinny.willis3@cdhb.health.nz

APPENDIX 3

THEATRE FORMS

PRIMARY ANKLE REPLACEMENT

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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

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

PRIMARY SURGEON
- ◯ Consultant
- ◯ Advanced trainee supervised
- ◯ Advanced trainee unsupervised

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	Talus
Please do not fold placed stickers bar coded label	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

APPENDIX 3

THEATRE FORMS

PRIMARY CERVICAL DISC REPLACEMENT

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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]...

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

PRIMARY SURGEON
○ Consultant ○ Adv Trainee Unsupervised ○ Adv Trainee Supervised ○ Basic Trainee

---

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

Implants	Implants
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label
Implants	**Implants**
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

PRIMARY ELBOW REPLACEMENT

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

○ LEFT - SIDE - RIGHT ○
IF BILATERAL THEN DO SEPARATE FORMS

STICK PATIENT LABEL HERE
PLEASE PLACE IMPLANT LABELS ON THE REVERSE

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	Ulna
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Radial Head	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT
[IF DIFFERENT FROM PATIENT LABEL]

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

FINGER - MCPJ
- ○ Index
- ○ Middle
- ○ Ring
- ○ Little

FINGER - PIPJ
- ○ Index
- ○ Middle
- ○ Ring
- ○ Little

THUMB
- ○ CMCJ
- ○ MCPJ

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

APPROACH [TICK ALL THAT APPLY]
- ○ Volar
- ○ Dorsal
- ○ Lateral

PROSTHESIS TYPE
- ○ Silicone
- ○ Surface replacement
- ○ Pyrocarbon
- ○ Other [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

Hand - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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.

HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT
[IF DIFFERENT FROM PATIENT LABEL]

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]...

APPROACH [TICK ALL THAT APPLY]
- ○ Posterior
- ○ Anterior
- ○ Superior
- ○ Lateral
- ○ Trans-trochanteric (osteotomy)

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

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	Acetabulum
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Femoral head	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

○ LEFT - SIDE - RIGHT ○
IF BILATERAL THEN DO SEPARATE FORMS

STICK PATIENT LABEL HERE
PLEASE PLACE IMPLANT LABELS ON THE REVERSE

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
- ○ Menisectomy
- ○ 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	Tibia
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Patella	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

PRIMARY LUMBAR DISC REPLACEMENT

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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 Fans ☐ One-piece Toga or ☐ Sterile Hood and Gown
- ○ Conventional Gown

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

Implants	Implants
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label
Implants	**Implants**
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT

IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

○ LEFT - SIDE - RIGHT ○
IF BILATERAL THEN DO SEPARATE FORMS

STICK PATIENT LABEL HERE
PLEASE PLACE IMPLANT LABELS ON THE REVERSE

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]...

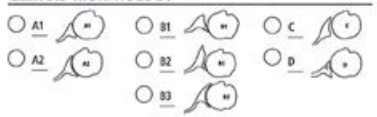
DIAGNOSIS
- ○ Osteoarthritis
- ○ Rheumatoid arthritis/other inflammatory
- ○ Cuff tear arthropathy
- ○ Massive cuff tear without arthritis
- ○ Acute fracture proximal humerus
- ○ Post old trauma
- ○ Avascular necrosis
- ○ Post recurrent dislocation
- ○ Tumour
- ○ Other [SPECIFY]...

APPROACH [TICK ALL THAT APPLY]
- ○ Deltopectoral
- ○ Navigation
- ○ Patient specific instrumentation
- ○ Other [SPECIFY]...

HUMERAL STEM TYPE
- ○ Standard
- ○ Stemless
- ○ Short/metaphyseal stem

STRUCTURAL BONE GRAFT GLENOID
- ○ Allograft ○ Autograft

GLENOID MORPHOLOGY



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

Glenoid ○ Yes ○ No

PLACE CEMENT STICKER OR COMPLETE
Cement Name:
Cement Antibiotic (if present):

Humerus	Glenoid
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Humeral Head	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

PRIMARY REPLACEMENT WRIST
(WRIST, DRUJ)

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]

BMI

CONSULTANT
[IF DIFFERENT FROM PATIENT LABEL]

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]...

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

PRIMARY SURGEON

○ Consultant ○ Adv Trainee Unsupervised ○ Adv Trainee Supervised ○ Basic Trainee

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

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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 osseointergrate
- ○ 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]..

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

PRIMARY SURGEON

○ Consultant ○ Advanced trainee supervised ○ Advanced trainee unsupervised

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

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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

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	Implants
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label
Implants	**Implants**
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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 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 ◯ Adv Trainee Supervised ◯ Basic Trainee

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
- ◯ 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
Ulna ◯ Yes ◯ No
Radial ◯ Yes ◯ No

PLACE CEMENT STICKER OR COMPLETE
Cement Name:
Cement Antibiotic (if present):

Humerus	Ulna
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label
Radial Head	**Augments**
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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
- ◯ Index
- ◯ Middle
- ◯ Ring
- ◯ Little

FINGER - PIPJ
- ◯ Index
- ◯ Middle
- ◯ Ring
- ◯ 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
- ◯ Adv Trainee Supervised
- ◯ Basic Trainee

APPROACH [TICK ALL THAT APPLY]
- ◯ Volar
- ◯ Dorsal
- ◯ Lateral

PROSTHESIS TYPE
- ◯ Silicone
- ◯ Surface replacement
- ◯ Pyrocarbon
- ◯ Other [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

Hand - Implant information stickers

Please do not fold placed stickers
bar coded label

IMPORTANT

IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

REVISION / RE-OPERATION HIP

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]

BMI

CONSULTANT
[IF DIFFERENT FROM PATIENT LABEL]

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:

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

- ○ 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):

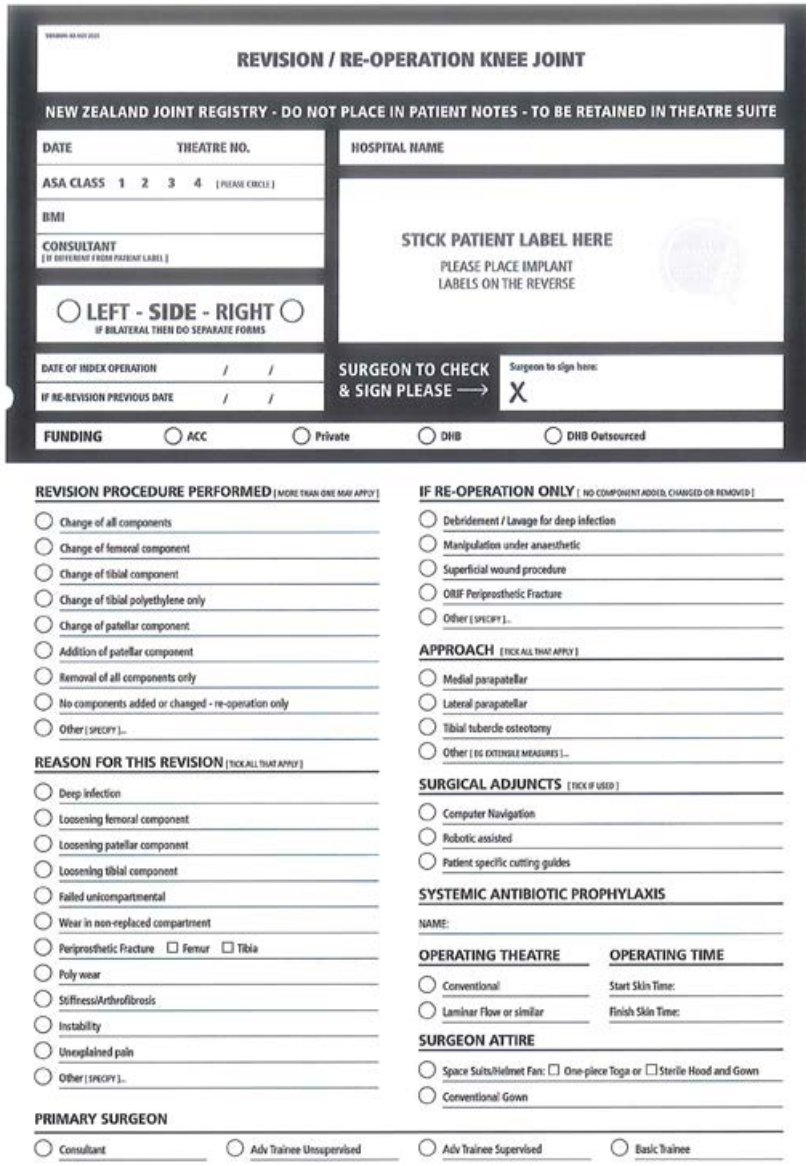
Femur	Acetabulum
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Femoral head	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS



REVISION / RE-OPERATION KNEE 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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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]...

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 [DO 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

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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	Implants
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label
Implants	**Implants**
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

REVISION / RE-OPERATION SHOULDER

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]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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]..

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]
- ○ Deltopectoral
- ○ 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

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
Glenoid ○ Yes ○ No

PLACE CEMENT STICKER OR COMPLETE
Cement Name:
Cement Antibiotic (if present):

Humerus	Glenoid
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

Humeral Head	Augments
Please do not fold placed stickers bar coded label	Please do not fold placed stickers bar coded label

IMPORTANT
IF A BILATERAL PROCEDURE TWO COMPLETED FORMS ARE REQUIRED

APPENDIX 3

THEATRE FORMS

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. | HOSPITAL NAME

ASA CLASS 1 2 3 4 [PLEASE CIRCLE]

BMI

CONSULTANT [IF DIFFERENT FROM PATIENT LABEL]

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]...

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

PRIMARY SURGEON

○ Consultant ○ Adv Trainee Unsupervised ○ Adv Trainee Supervised ○ Basic Trainee

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

APPENDIX 4

NZJR QUESTIONNAIRES

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
☐	☐	☐	☐	☐

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?

No nights	Only 1 or 2 nights	Some nights	Most nights	Every night
☐	☐	☐	☐	☐

Finally, please check that you have answered every question.
Thank you very much.

Revision 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 ☐

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?
    No nights ☐ | Only 1 or 2 nights ☐ | Some nights ☐ | Most nights ☐ | Every night ☐

Finally, please check that you have answered every question.
Thank you very much.

APPENDIX 4

NZJR QUESTIONNAIRES

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.

Section 1: Pain Intensity
- ☐ I have no pain at the moment.
- ☐ The pain is very mild at the moment.
- ☐ The pain is moderate at the moment.
- ☐ The pain is fairly severe at the moment.
- ☐ The pain is very severe at the moment.
- ☐ The pain is the worst imaginable at the moment.

Section 2: Personal Care (Washing, Dressing, etc)
- ☐ I can look after myself normally, without causing extra pain.
- ☐ I can look after myself normally, but it causes extra pain.
- ☐ It is painful to look after myself and I am slow and careful.
- ☐ I need some help, but manage most of my personal care.
- ☐ I need help every day in most aspects of self care.
- ☐ I do not get dressed, I wash with difficulty and stay in bed.

Section 3: Lifting
- ☐ I can lift heavy weights without extra pain.
- ☐ I can lift heavy weights, but it gives extra pain.
- ☐ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example, on a table.
- ☐ Pain prevents me from lifting heavy weights off the floor, but I can manage light to medium weights if they are conveniently positioned.
- ☐ I can lift very light weights.
- ☐ I cannot lift or carry anything at all.

Section 4: Reading
- ☐ I can read as much as I want to with no pain in my neck.
- ☐ I can read as much as I want to with slight pain in my neck.
- ☐ I can read as much as I want to with moderate pain in my neck.
- ☐ I can't read as much as I want because of moderate pain in my neck.
- ☐ I can hardly read at all because of severe pain in my neck.
- ☐ I cannot read at all.

Section 5: Headaches
- ☐ I have no headaches at all.
- ☐ I have slight headaches which come infrequently.
- ☐ I have moderate headaches which come infrequently.
- ☐ I have moderate headaches which come frequently.
- ☐ I have severe headaches which come frequently.
- ☐ I have headaches almost all the time.

Section 6: Concentration
- ☐ I can concentrate fully when I want to, with no difficulty.
- ☐ I can concentrate fully when I want to, with slight difficulty.
- ☐ I have a fair degree of difficulty in concentrating when I want to.
- ☐ I have a lot of difficulty in concentrating when I want to.
- ☐ I have a great deal of difficulty in concentrating when I want to.
- ☐ I cannot concentrate at all.

Section 7: Work
- ☐ I can do as much work as I want to.
- ☐ I can only do my usual work, but no more.
- ☐ I can do most of my usual work, but no more.
- ☐ I cannot do my usual work.
- ☐ I can hardly do any work at all.
- ☐ I can't do any work at all.

Section 8: Driving
- ☐ I can drive my car without any neck pain.
- ☐ I can drive my car as long as I want, but with slight neck pain.
- ☐ I can drive my car as long as I want, but with moderate neck pain.
- ☐ I can't drive my car as long as I want because of moderate pain in my neck.
- ☐ I can hardly drive at all because of severe pain in my neck.
- ☐ I can't drive my car at all.

Section 9: Sleeping
- ☐ I have no trouble sleeping.
- ☐ My sleep is slightly disturbed (less than 1 hour sleepless).
- ☐ My sleep is mildly disturbed (1-2 hours sleepless).
- ☐ My sleep is moderately disturbed (2-3 hours sleepless).
- ☐ My sleep is greatly disturbed (3-5 hours sleepless).
- ☐ My sleep is completely disturbed (5-7 hours sleepless).

Section 10: Recreation
- ☐ I am able to engage in all my recreation activities, with no neck pain at all.
- ☐ I am able to engage in all my recreation activities, with some pain in my neck.
- ☐ I am able to engage in most, but not all, of my usual recreation activities because of pain in my neck.
- ☐ I am able to engage in only a few of my usual recreation activities because of pain in my neck.
- ☐ I can hardly do any recreation activities because of pain in my neck.
- ☐ I can't do any recreation activities at all.

APPENDIX 4

NZJR QUESTIONNAIRES

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	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

2. Have you had difficulty carrying bags of shopping, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

3. Have you had any difficulty washing yourself all over, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

4. Have you had any difficulty dressing yourself, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

5. Have you felt that your elbow problem is "controlling your life"?

④	③	②	①	⓪
No, not at all	Occasionally	Some days	Most days	Every day

6. How much has your elbow problem "been on your mind"?

④	③	②	①	⓪
Not at all	A little of the time	Some of the time	Most of the time	All of the time

7. Have you been troubled by pain from your elbow in bed at night?

④	③	②	①	⓪
Not at all	1-2 nights	Some nights	Most nights	Every night

8. How often has your elbow pain interfered with your sleeping?

④	③	②	①	⓪
Not at all	Occasionally	Some of the time	Most of the time	All of the time

9. How much has your elbow problem interfered with your usual work or everyday activities?

④	③	②	①	⓪
Not at all	A little	Moderately	Greatly	Totally

10. Has your elbow problem limited your ability to take part in leisure activities that you enjoy doing?

④	③	②	①	⓪
No, not at all	Occasionally	Some of the time	Most of the time	All of the time

11. How would you describe the worst pain you have from your elbow?

④	③	②	①	⓪
No pain	Mild pain	Moderate pain	Severe pain	Unbearable

12. How would you describe the pain you usually have from your elbow?

④	③	②	①	⓪
No pain	Mild pain	Moderate pain	Severe pain	Unbearable

Overall, how satisfied are you with the outcome of your elbow surgery?

④	③	②	①	⓪
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied

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	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

2. Have you had difficulty carrying bags of shopping, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

3. Have you had any difficulty washing yourself all over, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

4. Have you had any difficulty dressing yourself, because of your elbow problem?

④	③	②	①	⓪
No difficulty	A little bit of difficulty	Moderate difficulty	Extreme difficulty	Impossible to do

5. Have you felt that your elbow problem is "controlling your life"?

④	③	②	①	⓪
No, not at all	Occasionally	Some days	Most days	Every day

6. How much has your elbow problem "been on your mind"?

④	③	②	①	⓪
Not at all	A little of the time	Some of the time	Most of the time	All of the time

7. Have you been troubled by pain from your elbow in bed at night?

④	③	②	①	⓪
Not at all	1-2 nights	Some nights	Most nights	Every night

8. How often has your elbow pain interfered with your sleeping?

④	③	②	①	⓪
Not at all	Occasionally	Some of the time	Most of the time	All of the time

9. How much has your elbow problem interfered with your usual work or everyday activities?

④	③	②	①	⓪
Not at all	A little	Moderately	Greatly	Totally

10. Has your elbow problem limited your ability to take part in leisure activities that you enjoy doing?

④	③	②	①	⓪
No, not at all	Occasionally	Some of the time	Most of the time	All of the time

11. How would you describe the worst pain you have from your elbow?

④	③	②	①	⓪
No pain	Mild pain	Moderate pain	Severe pain	Unbearable

12. How would you describe the pain you usually have from your elbow?

④	③	②	①	⓪
No pain	Mild pain	Moderate pain	Severe pain	Unbearable

Overall, how satisfied are you with the outcome of your elbow surgery?

④	③	②	①	⓪
Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Dissatisfied

APPENDIX 4

NZJR QUESTIONNAIRES

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

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 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

APPENDIX 4

NZJR QUESTIONNAIRES

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.

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 knee?

④ None	③ Very mild	② Mild	① Moderate	⓪ 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 No pain/over 30 minutes	③ 16 to 30 minutes	② 5 to 15 minutes	① Around the house only	⓪ 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 No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	⓪ Impossible to do

4. Could you kneel down and get up again afterwards on your operated knee?

④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	⓪ 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	⓪ No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on knee?

④ No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	⓪ Impossible to do

7. How much has pain from your operated on knee interfered with your usual work (including housework)?

④ Not at all	③ A little bit	② Moderately	① Greatly	⓪ 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 Not at all painful	③ Slightly painful	② Moderately painful	① Very painful	⓪ Unbearable

9. Have you felt that your operated on knee might suddenly "give way" or let you down?

④ Rarely/never	③ Sometimes, or just at first	② Often, not just at first	① Most of the time	⓪ All of the time

10. Have you been limping when walking, because of your operated on knee?

④ Rarely/never	③ Sometimes, or just at first	② Often, not just at first	① Most of the time	⓪ All of the time

11. Could you walk down one flight of stairs?

④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	⓪ No, impossible

12. Have you been troubled by pain from your operated on knee in bed at night?

④ No nights	③ Only 1 or 2 nights	② Some nights	① Most nights	⓪ Every night

Overall, how satisfied are you with the outcome of your knee surgery?

④ Very satisfied	③ Somewhat satisfied	② Neutral	① Somewhat dissatisfied	⓪ 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.

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 knee?

④ None	③ Very mild	② Mild	① Moderate	⓪ 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 No pain/over 30 minutes	③ 16 to 30 minutes	② 5 to 15 minutes	① Around the house only	⓪ 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 No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	⓪ Impossible to do

4. Could you kneel down and get up again afterwards on your operated knee?

④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	⓪ 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	⓪ No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on knee?

④ No trouble at all	③ Very little trouble	② Moderate trouble	① Extreme difficulty	⓪ Impossible to do

7. How much has pain from your operated on knee interfered with your usual work (including housework)?

④ Not at all	③ A little bit	② Moderately	① Greatly	⓪ 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 Not at all painful	③ Slightly painful	② Moderately painful	① Very painful	⓪ Unbearable

9. Have you felt that your operated on knee might suddenly "give way" or let you down?

④ Rarely/never	③ Sometimes, or just at first	② Often, not just at first	① Most of the time	⓪ All of the time

10. Have you been limping when walking, because of your operated on knee?

④ Rarely/never	③ Sometimes, or just at first	② Often, not just at first	① Most of the time	⓪ All of the time

11. Could you walk down one flight of stairs?

④ Yes, easily	③ With little difficulty	② With moderate difficulty	① With extreme difficulty	⓪ No, impossible

12. Have you been troubled by pain from your operated on knee in bed at night?

④ No nights	③ Only 1 or 2 nights	② Some nights	① Most nights	⓪ Every night

Overall, how satisfied are you with the outcome of your knee surgery?

④ Very satisfied	③ Somewhat satisfied	② Neutral	① Somewhat dissatisfied	⓪ Dissatisfied

APPENDIX 4

NZJR QUESTIONNAIRES

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	⓪ Unbearable

2. How would you describe the pain you usually have from your operated on shoulder?

④ None	③ Mild	② Moderate	① Severe	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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 None	③ Mild	② Moderate	① Severe	⓪ Unbearable

2. How would you describe the pain you usually have from your operated on shoulder?

④ None	③ Mild	② Moderate	① Severe	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ 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	⓪ Dissatisfied

Hand Rehab

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...

Hand Rehab

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?

NEW ZEALAND
JOINT REGISTRY

www.nzoa.org.nz/nzoa-joint-registry