NEW ZEALAND ORTHOPAEDIC ASSOCIATION

NATIONAL JOINT REGISTRY

SEVEN YEAR REPORT

JANUARY 1999 TO DECEMBER 2005

This report was prepared by staff of the New Zealand National Joint Registry.

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REPORT HIGHLIGHTS

It is our pleasure to present the 7 Year Report of the New Zealand Orthopaedics Association's National Joint Registry. The format of the previous two years has been followed but there is some additional material particularly greater analysis of the Oxford 12 scores including 5 year scores for hips and knees.

The total number of registered joint arthroplasties at 31.12.2005 was 72,128 an increase of 13675 for 2005 and compared to the 12677 increase in 2004 represents a 7.9% increase. Primary hips and knees account for 82.5% of the registrations. The main areas of growth during 2005 were primary hips 5%, primary knees 23% and somewhat surprisingly primary ankles 49%. However the most dramatic growth has been hip resurfacing arthroplasty with an increase from 21 to 160; a 660% increase. Primary unicompartmental knee registrations continued their decline as they decreased by a further 12%.

The ASA classification was added to the data forms in 2005 in order to assess the co-morbidity of patients undergoing total joint arthroplasty. It is disappointing that only 50% of received forms had this data. The majority of patients undergoing arthroplasty were ASA class 2 ie a patient with mild systemic disease. A comparison of public versus private hospitals for THA's and TKA's confirm that relatively more ASA 1 and fewer ASA 3 patients had their surgery in a private hospital.

The Kaplan Meier survival curves for primary replacements demonstrate very small annual increase of revisions of registered primary joints and over the 7 year period 1.95% of hips and 1.77% of knees have been revised with 0.3% and 0.4% respectively for deep infection. These latter numbers have dropped off dramatically in years 6 and 7.

For hips, cemented femoral components are doing better than uncemented but there appears to be little difference between cemented and uncemented acetabular components. A similar analysis for knees has not been performed as 87% of femoral components and 92% of tibial components are cemented. With regard to cementation little more than 50% of primary arthroplasties are recorded as using antibiotic impregnated cement and it is noteworthy that a study from the Registry by Angus Wickham showed by regression analysis that the risk of revision for deep infection in THA's was significantly reduced by the use of antibiotic impregnated cement. (See abstract in Appendix).

The minimally invasive surgery approach first appeared on data forms in 2003 and it was expected that it would "take off' but this has not been demonstrated for either THA or TKA but for UKA it was used in 30% of procedures in 2005.

Image guided surgery has also been pushed hard over the last few years but in 2005 it was used in just 0.5% of THA's, down from 1.2% in 2004 and 0.3% of TKA's slightly up from 0.2% in 2004. IGS has been recorded for just two UKA's.

It is noted that over the last three years there has been a steady increase in the use of laminar flow theatres $\pm$ space suits for joint arthroplasty. Currently over one third of TJA's are done in laminar flow theatres and for approximately 15% the surgeon uses a space suit. However from analysis of theatre type versus deep infection , laminar flow $\pm$ space suits does not appear to reduce the incidence of deep infection.

This year it has been possible to differentiate between supervised and unsupervised advanced trainees performing surgery and this information may be of interest to supervisors of training. For example 246 primary knees and 6 revision knees are registered as supervised and 29 primary and 2 revision knees as unsupervised by advanced trainees for 2005.

Greater analyses of the Oxford 12 six month and the first 5 year questionnaire returns for the hip and the knee has been undertaken. An interesting finding is that the mean 6 month scores for those who subsequently have had a revision for whatever reason is significantly higher than those unrevised to date eg the mean six month hip score of those subsequently revised is 24.65 verses 18.47 for unrevised. In view of this difference it was decided to investigate whether the six month Oxford Score could be used as a predictor of revision risk. By using logistic

regression it has been demonstrated that for the knee every unit increase of Oxford Score from the minimum 12 carries a 9% increase in the risk of revision and for the hip 7%. This correlation was further substantiated by plotting the patient six month scores in groups of 5 against the proportion of joints revised for each score group. For example a patient with a knee score between 16 and 20, had a 1.0% risk of revision whereas a score between 46 and 50 had a 14% risk of revision within 6 ½ years. These correlations may be a useful guide for individual surgeons to decide which patients should have longer term follow-up.

The individual questions have also been analysed for six months and 5 years, (hip and knee only) to see which score well and which not so well. It is interesting that there would appear to be little functional improvement over the 5 year period. In other words function and pain levels at six months are a good indicator of the final outcome.

This year especially at the Combined AOA and NZOA Meeting in Canberra there were several Registry based papers presented and the abstracts of these have been included in the Appendix. Not only do they demonstrate how useful the Registry is as an audit and research data base but they also have interesting findings and conclusions such as noted above. During 2005 a senior Dutch medical student Anton Hosman spent six months auditing total ankle arthroplasty from the Registry and presented a well received paper at the New Zealand Foot and Ankle Society Meeting in Wanaka. His abstract also appears in the Appendix and the paper has been submitted for publication.

Alastair Rothwell
Supervisor

Toni Hobbs
Coordinator

ACKNOWLEDGMENTS

The Registry is very appreciative of the support from the following

Canterbury District Health Board:
for the website and other facilities

Chris Frampton, Christchurch School of Medicine and Health Sciences:
for data statistical analysis

John Hawkins, IT CDHB:
for assistance with accessing mortality data and Ministry Of Health requirements

Kim Miles, New Zealand Orthopaedic Association:
for his persistent and very successful efforts in obtaining long term funding for the Registry

OILA Group:
for their strong support and commitment to the Registry

NZHIS:
for audit compliance information

Mike Wall, Alumni Software:
for continued monitoring and upgrading of data base software

PARTICIPATING HOSPITALS

We wish to gratefully acknowledge the support of all participating hospitals and especially the coordinators who have taken responsibility for the data forms

PUBLIC HOSPITALS

Auckland Hospital, Auckland, Contact: Shelley Thomas

Burwood Hospital, Christchurch 8083, Contact: Diane Darley

Christchurch Hospital, Christchurch 8140, Contact: Carolyn Wood

Dunedin Hospital, Dunedin 9016, Contact: Leah Millar or Carol Osten

Gisborne Hospital, Gisborne 4010, Contact: Jackie Dearman

Grey Base Hospital, Greymouth 7840, Contact: Rose Ruddle

Hawkes Bay Hospital, Hastings 4120, Contact: Lavonne Collins

Hutt Hospital, Lower Hutt 5040, Contact: Michelle Kinzett

Kenepuru Hospital, Porirua 2104, Contact: Judy Tully

Manukau Surgery Centre, Auckland 5840, Contact: Amber Terry or Marilyn Burton

Masterton Hospital, Masterton 1640, Contact: Jan Struthers

Middlemore Hospital, Auckland, 1640 Contact: Luisa Lilo

Nelson Hospital, Nelson 7040, Contact: Pauline Manley

Palmerston North Hospital, Palmerston North 5301, Contact: or Karen Languad-Forster

Rotorua Hospital (Lakeland), Rotorua 3046, Contact: Maggie Walsh

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Taranaki Base Hospital, New Plymouth 4342, Contact: Allson Tijsen

Tauranga Hospital, Tauranga 3143, Contact: Susan Clynes

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Waikato Hospital, Hamilton 3204, Contact: Maria Ashhurst or Helen Keen

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Wanganui Hospital, Wanganui, Contact: Karen McCormick

Wellington Hospital, Newtown 6242, Contact: Vicki Smith

Whakatane Hospital, Whakatane 3158, Contact: Karen Burke

Whangarei Hospital, Whangarei 0140, Contact: Beth McLean

Private Hospitals

Aorangi Hospital, Palmerston North 440, Contact: Frances Clark

Ascot Integrated Hospital, Remuera 1050, Contact Maggie Butler

Belverdale Hospital, Wanganui 4500, Contact: Dawn Thornton

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Braemar Hospital Ltd, Hamilton 3204, Contact: Allison Vince

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Kensington Hospital, Whangarei 0112, Contact: Christina Rood

Manuka Street Trust Hospital, Nelson 7010, Contact: Diane Molyneux

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Queen Elizabeth Hospital, Rotorua 3010, Contact: Chris Mott

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Southern Cross Hospital, New Plymouth 4310, Contact: Raewyn Woolliams

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Southern Cross Hospital, Rotorua 3015, Contact: Diana McArthur

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ACCIDENT COMPENSATION CORPORATION

DISTRICT HEALTH BOARDS

MINISTRY OF HEALTH

NEW ZEALAND ORTHOPAEDIC ASSOCIATION

ORTHOPAEDIC SURGEONS

SOUTHERN CROSS HOSPITALS

WISHBONE TRUST

PROFILE OF THE AVERAGE NEW ZEALAND ORTHOPAEDIC SURGEON 2005 *

From our analyses the average orthopaedic surgeon performs on an annual basis:

- 37 Total hip arthroplasties — using a cemented femoral component and cementless acetabular component; has a 97.4% survival at 6 years with 0.32% revised for deep infection. 77% at 6 months and 85% at 5 years had an excellent or very good Oxford Score.**
- 32 Total knee arthroplasties — with almost all cemented but only 10 with patellae replaced; has a 97.0% survival at 6 years with 0.4% revised for deep infection. 61% at 6 months and 69% at 5 years had an excellent or very good Oxford Score.
- 8 Unicompartmental knee arthroplasties — almost all cemented; has a 91.7% survival at 5 years with 0.2% revised for deep infection. 67% had an excellent or very good Oxford Score at 6 months
- 5 Shoulder arthroplasties — with a 50/50 split between total and hemi; has a 95.5% survival at 5 years with 0.1% revised for deep infection 54% had an excellent or very good Oxford Score at 6 months.
- 8 total ankle arthroplasties — all uncemented; has a 95.4% survival at 5 years with none revised for deep infection. 43% had excellent or very good Oxford derived scores at 6 months.
- 2 total elbow arthroplasties — most likely a cemented Coonrad-Morrey prosthesis; has a 95.5% survival at 5 years with 1.2% revised for deep infection. 66% had excellent or very good Oxford derived scores at 6 months.

* averages derived from the number of surgeons actually doing the above procedures and not from the total pool of orthopaedic surgeons.

COMMENTS

The comments scattered throughout the report are entirely Alastair Rothwells and have NOT been peer reviewed.

**As per the new grading system (See Appendix 2)

DEVELOPMENT AND IMPLEMENTATION OF THE NEW ZEALAND JOINT REGISTRY

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

New Zealand surgeons have 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; 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 data base for fund raising 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 his 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 clear message from the NZOA membership was to keep the forms for data collection simple and user friendly. The Norwegian Joint Registers form was used as a starting point but a number of changes were made following early trials. The forms are largely if not completely filled out by the Operating Theatre Circulating Nurse and are meant to be checked and signed by the surgeon at the end of the operation.

Data Base

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

Patient Generated Outcomes

The New Zealand Registry is the first Registry to collect data from Patient Generated Outcomes. The “Oxford 12” validated Hip and Knee patient questionnaires were chosen to which were added questions relating to dislocation, infection and any other complication that did not require further joint surgery. It was agreed that these questionnaires should be sent to all registered patients six months following surgery and then at five yearly intervals. The initial response rate was between 70 & 75% and this has remained steady over the five year period.

However because of the large numbers of registered primary THA’s and TKA’s and on the advice of our statistician, questionnaires have been sent out on a random selection basis since July 2002 to achieve 1000 annual responses for each group.

Funding

Several sources of funding were investigated including contributions from the Ministry of Health, various funding agencies, medical insurance societies and an implant levy payable by surgeons and public hospitals to supplement a grant from the NZOA. In the early years the Registry had a “hand to mouth” existence relying on grants from the NZOA, the Wishbone Trust and for the last three years significant annual grants from the ACC. From 2002 funding has become more reliable with the surgeons paying the $10 levy for each joint registered from a private hospital, and the MOH agreeing to pay $72,000 a year as part of the

Government Joint Initiative. For 2005 the Southern Cross Hospitals have contributed $10,000.

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 readily approved but the second part required several amendments to patient information and consent forms before approval was obtained.

However an unexpected snag occurred 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 having to obtain patient consent has created some difficulties with compliance.

Surgeon and Hospital Reports

It was agreed that every six months reports were to be generated from the Registry data base for primary and revision hip and knee replacements and to consist of: the number of procedures performed by the individual surgeon or at the hospital; the total number of procedures performed in the region in which the surgeon works; the national total and cumulative totals for each of these categories. Six month and more recently 5 year Oxford 12 scores are also included.

Reporting to the NZOA

A Registry update is provided in the quarterly newsletter as well as an annual report and financial statement.

Introduction of the Registry

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

Stage I November 1997 to March 1998
The base administrative structure was established. The data forms and the data base were developed and a trial was performed at Burwood Hospital.

Stage II April 1998 to June 1998
Further trialing 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.

DEVELOPMENTS SINCE THE INTRODUCTION OF THE REGISTRY

Inclusion of other joint replacement arthroplasties

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

The Oxford questionnaire was available for the shoulder joint and was adapted for the elbow and ankle joints.

Monitoring of Data Collection

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

It is quite easy to check the compliance for public hospitals as they are required to make regular returns with details of all joint replacement surgery to the NZ Health Information Service. For a small fee 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.

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 March 2005 again demonstrated a New Zealand wide public hospital compliance of 98% when compared to NZHIS data

Registered patient deaths are also obtained from the NZHIS.

BAR CODING

Over 50% of labels for prostheses are bar coded and it is now possible to scan one third of all data forms directly into the data base, This is a significant time saver and it is expected this percentage will increase over time.

Staffing

Staff has expanded to include up to four part time data entry and secretarial personnel. This is in order to maintain a lag time between receipt and entry of data forms of no more than two months. It has also been necessary to employ extra staff in order to free up the Coordinator to cope with the ever increasing numbers of requests for Registry data.

The 2005 Registry staff are Alastair Rothwell, Supervisor, Toni Hobbs, Coordinator, Pat Manning Secretary, Lynley Diggs and Gill Ferguson data processors.

Use of Registry Data

There have been increasing numbers of requests for information from the Joint Registry from a wide variety of sources. Great care is taken to protect patient confidentiality at all times and patient details are only released to appropriately credited personnel and it is emphasised that Ethics Committee approval is required for any research projects involving patient contact.

Registry Committee

This committee has now been formalised and the membership consists of: 3 Orthopaedic Surgeons; Registry Coordinator; OILA Representative; Arthritis New Zealand Representative; Chief Executive NZOA. The main tasks of the Committee are to monitor the organisational structure and functions of the Registry, rule on difficult requests for information from the Registry, advise appropriate authorities regarding data from the Registry that could effect the health status of implant patients, encourage and support research and work with the International Registry Association.

NUMBER OF JOINTS ANALYSED
1ST JANUARY 1999 – 31ST DECEMBER 2005

Numbers of procedures registered

	7 Years	6 Years	5 Years
Hips, primary	35998	29680	23457
Hips, revision	5487	4570	3641
Knees, primary	23565	18537	14371
Knees, revision	2149	1736	1419
Knees, unicompartmental	3122	2565	1926
Shoulders, primary	1275	982	693
Shoulders, revision	80	57	45
Elbows, primary	160	130	101
Elbows, revision	26	20	15
Ankles, primary	216	146	99
Ankles, revision	12	8	6
Lumbar Disc, primary	38	22	
TOTAL	72128	58,453	45,776

BILATERAL JOINT REPLACEMENTS CARRIED OUT UNDER THE SAME ANAESTHETIC

Bilateral hips	738 patients	(1476 hips)	4.0%	of primary hips
Bilateral knees	1093 patients	(2186 knees)	9.0 %	of primary knees
Unicompartmental knees	249 patients	(498 knees)	16.0%	of primary unicompartmental knees
Bilateral ankles	2 patients	(4 ankles)		
Bilateral shoulders	2 patients	(4 shoulders)		

The percentages have remained essentially unchanged from the previous reports.

Data Statistical Analysis Statistical analysis has been confined to the five Kaplan-Meier survival curves and the relationship between Oxford 12 scores and revisions of primary joints. The Registry is very grateful to Associate Professor Chris Frampton, Christchurch School of Medicine and Health Sciences for generating these.

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

HIP ARTHROPLASTY

PRIMARY HIP ARTHROPLASTY

The seven-year report analyses data for the period January 1999 – December 2005. There were 35,998 primary hip procedures registered, an additional 6311 compared to last year's report. This includes 160 resurfacing procedures; an increase of 139 in the last year.

1999	4119
2000	4723
2001	4933
2002	4831
2003	5052
2004	6029
2005	6311

There has been a 5% increase in 2005 registrations compared to 2004.

DATA ANALYSIS

Age & Sex Distribution

The average age for all patients was 66.85yrs ranging from15.43 to 100.13. Further analysis is in the following charts

All Hip Arthroplasties

	Female	Male
Number	18872	17126
Percentage	52.40	47.60
Mean age	68.33	65.22
Maximum age	100.13	96.97
Minimum age	15.43	15.87
Standard Deviation	11.79	11.47

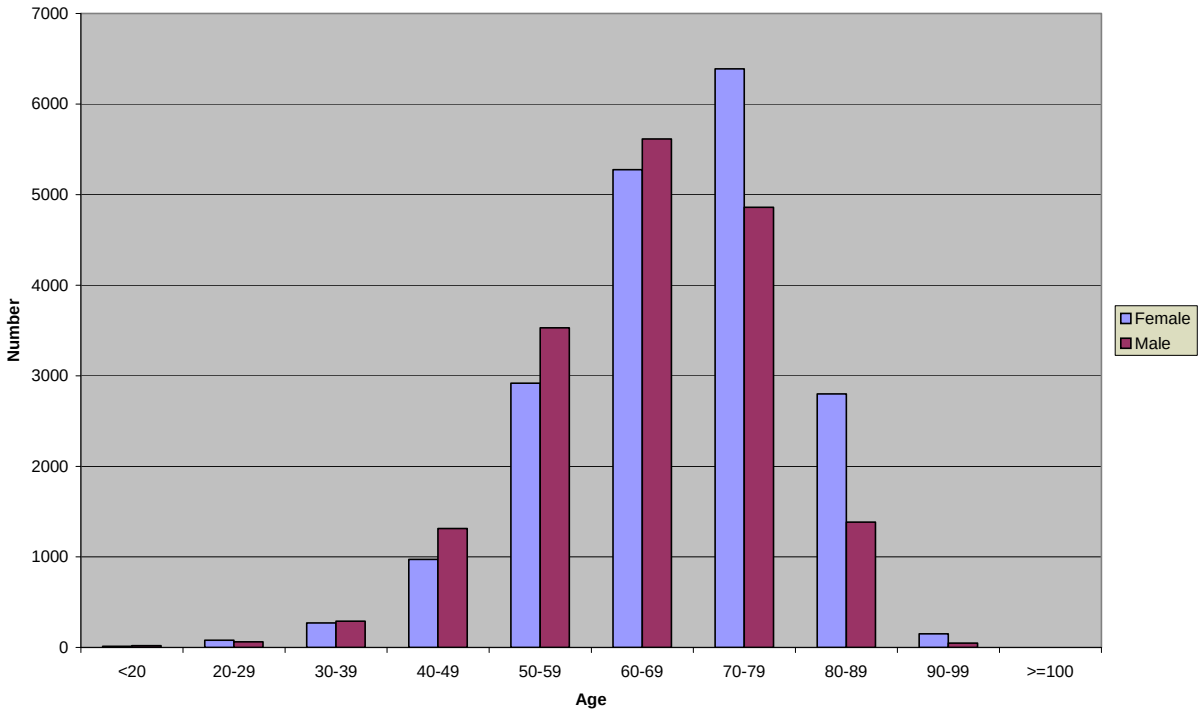
Conventional Hip Arthroplasty

	Female	Male
Number	18836	17002
Percentage	52.60	47.40
Mean age	68.37	65.32
Maximum age	100.13	96.97
Minimum age	15.43	15.87
Standard Deviation	11.76	11.43

Resurfacing Hip Arthroplasty

	Female	Male
Number	36	124
Percentage	22.50	77.50
Mean age	47.95	52.21
Maximum age	65.88	67.66
Minimum age	25.72	25.62
Standard Deviation	8.71	8.11

Age band distribution over 7 years



Previous operation	
None	33768
Internal fixation	813
Osteotomy	250
Internal fixation for SUFE	65
Arthrodesis	42
Core decompression	24
Arthroscopy/arthrotomy	22
Open reduction	17
Other	37

Diagnosis	
Osteoarthritis	30306
Acute fracture NOF	1243
Avascular necrosis	1153
Developmental dysplasia	1036
Rheumatoid arthritis	650
Old fracture NOF	497
Other inflammatory	381
Post acute dislocation	144
Tumour	150
Fracture acetabulum	80
Other	36

Approach	
Posterior	21496
Lateral	10114
Anterior	2097
Minimally invasive	156
Trochanteric osteotomy	82

The number of minimally invasive procedures registered in 2005 was 35 compared to 70 for 2004.

Bone graft	
Femoral autograft	95
Femoral allograft	17
Femoral synthetic	1
Acetabular autograft	185
Acetabular allograft	24
Acetabular synthetic	1

Cement		
Femur cemented	26423	(73%)
Antibiotic in cement	12905	(49%)
Acetabulum cemented	14406	(40%)
Antibiotic in cement	7284	(50%)

See abstract in appendix re infection and antibiotic cement.

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic 34286 (95%)

A cephalosporin was used in 96% of hip replacements.

Operating theatre

Conventional	25234
Laminar flow	10166
Space suits	5722

The percentage of surgery carried out in laminar flow theatres has increased from 24% in the 5 Year report to 29% and the use of space suits from 12% to 16%. This is despite the findings from the Registry that use of these does not reduce the incidence of early infection (See revision section).

ASA Class

This was introduced with the updated forms at the beginning of 2005 with the aim of better quantifying preoperative morbidity. There are 3144 /6311 registered primary hip procedures with the ASA class recorded.

Definition

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

ASA	No	%	Mean age
1	583	19	58.46
2	1825	58	66.73
3	706	22	72.14
4	30	1	72.37

The less than 50% compliance is disappointing.

ASA gradings Public vs Private Hospitals

	% Public	% Private
ASA1	12.3	25.9
ASA2	53.5	57.4
ASA3	27.1	16.1
ASA4	1.3	0.5

This table confirms that patients with higher ASA gradings ie greater morbidity, are more likely to have their surgery in a public hospital.

Operative time – skin to skin

Mean	83 minutes
Standard deviation	28 minutes
Minimum	24 minutes
Maximum	459 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the data is for 2005 only.

Consultant	5545
Advanced trainee supervised	291
Basic trainee	173
Advanced trainee unsupervised	79

Most of unsupervised were elective THRS & 37 were from one hospital.

Prosthesis usage

Conventional primary hips

Top 12 femoral components used in 2005

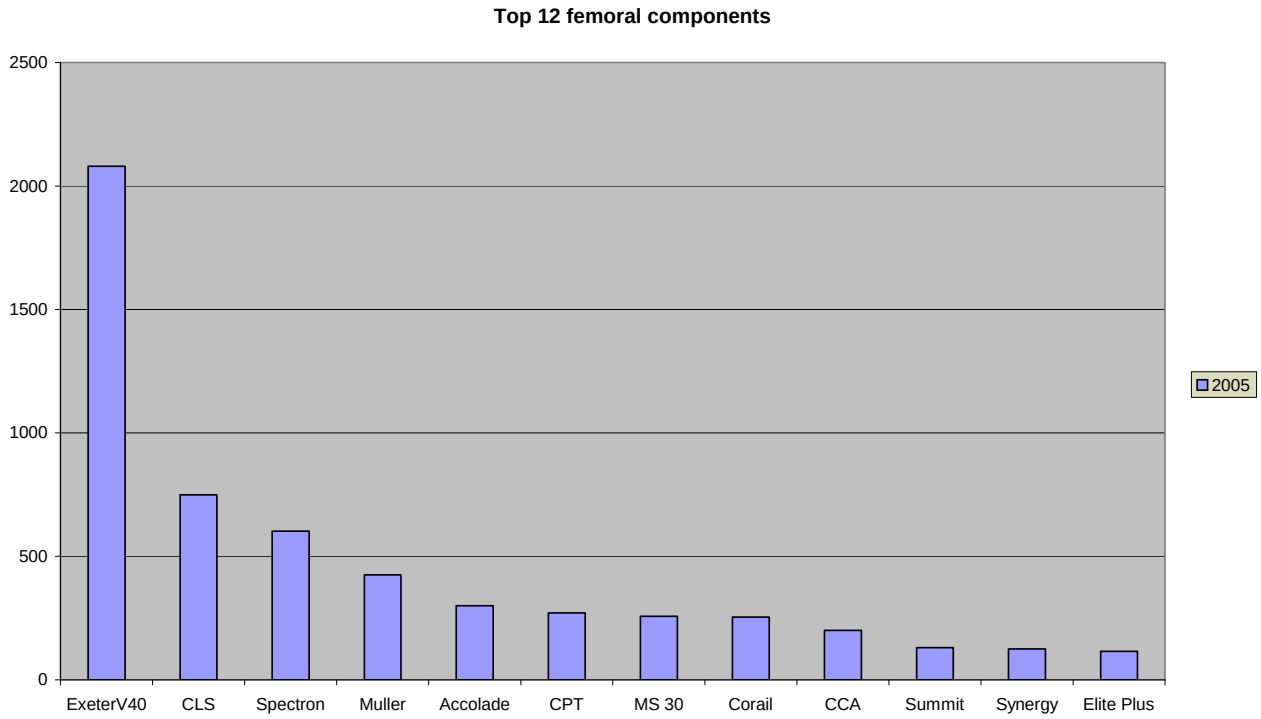
Exeter V40	2080
CLS	749
Spectron	602
Muller	425
Accolade	300
CPT	271
MS 30	257
Corail	254
CCA	200
Summit	130
Synergy	125
Elite Plus	115

Compared to 2004 Summit & Synergy have replaced Versys & ABG2

Resurfacing hips

	2004	2005
BHR	7	101
ASR	10	38
Durom	4	-
	21	139

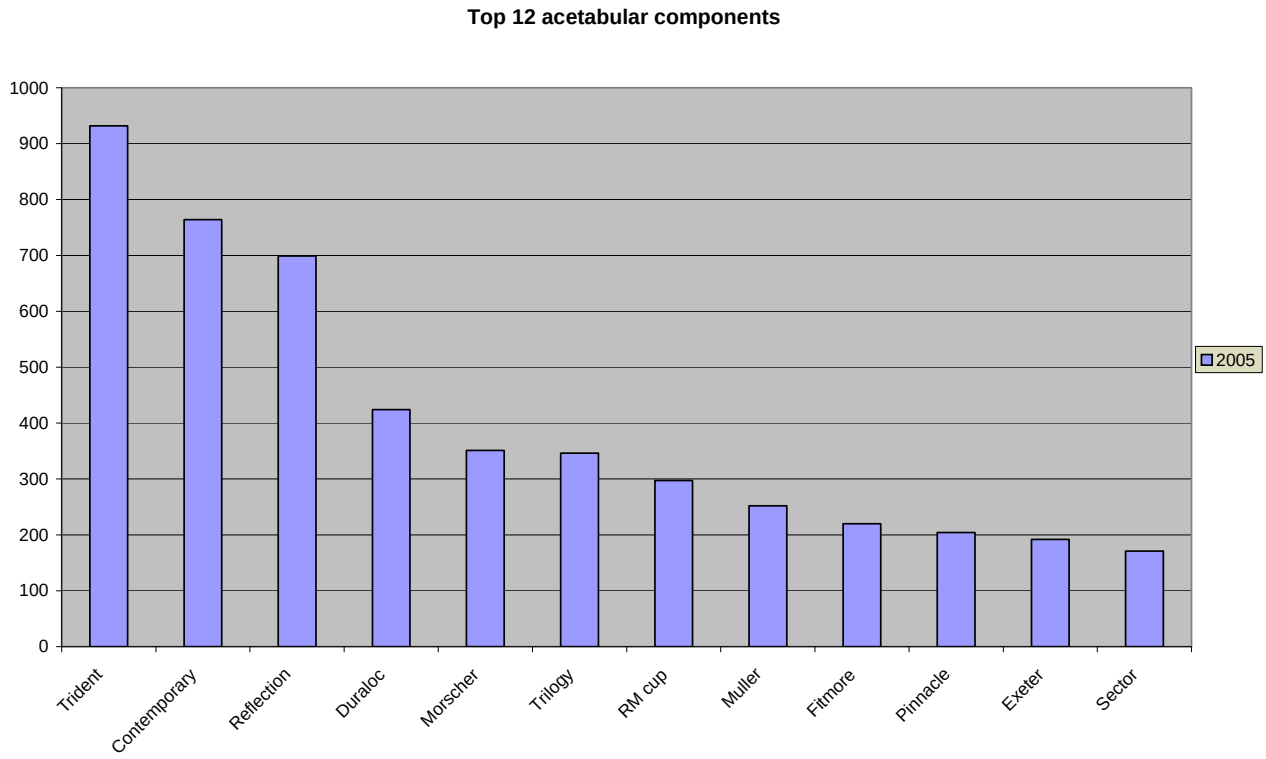
There are 160 resurfacing procedures registered to 16 surgeons. The BHR is the most popular resurfacing prosthesis accounting for 69% of the total.



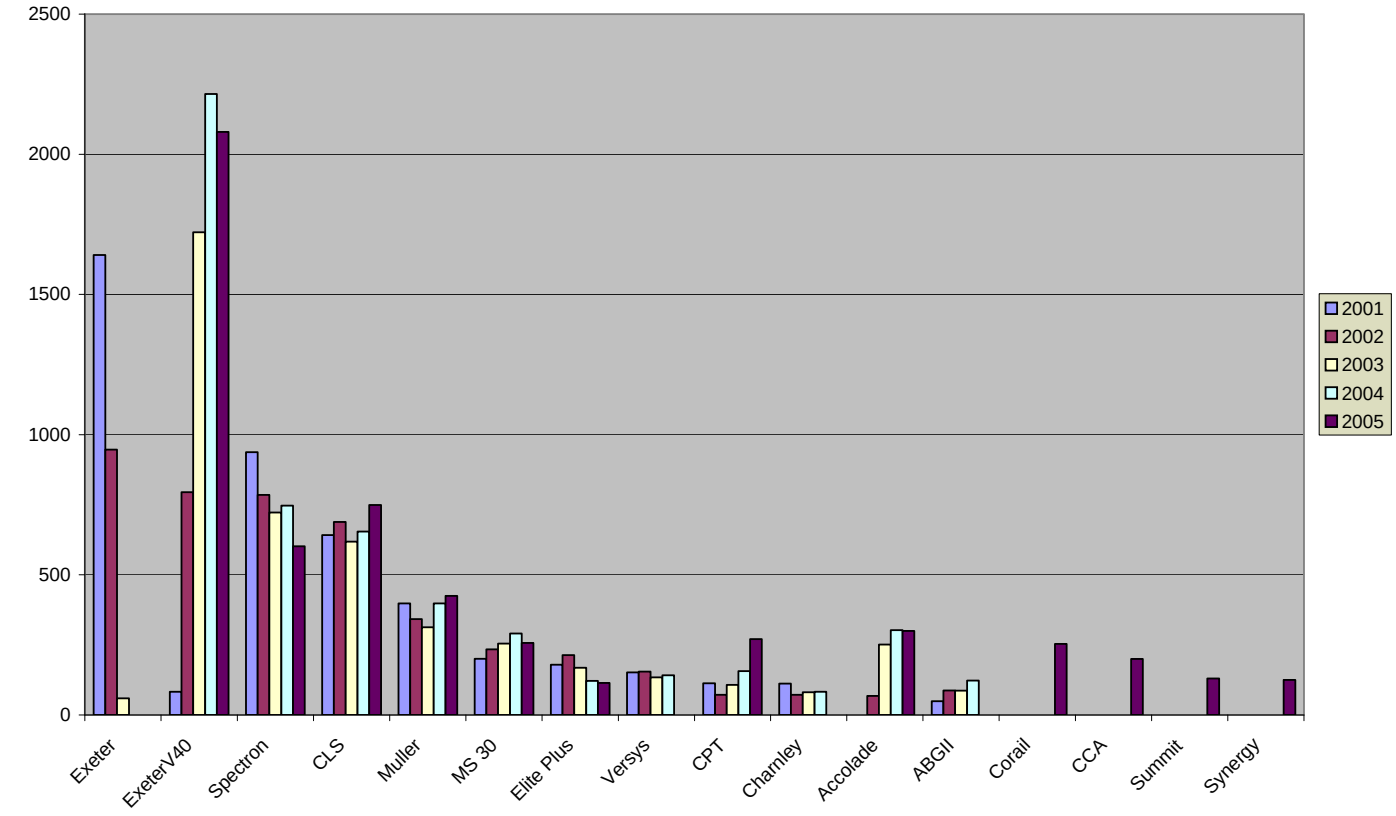
Top 12 acetabular components used in 2005

Trident	932
Contemporary	764
Reflection	699
Duraloc	424
Morscher	351
Trilogy	346
RM cup	297
Muller	252
Fitmore	220
Pinnacle S2	204
Exeter	192
Sector	171

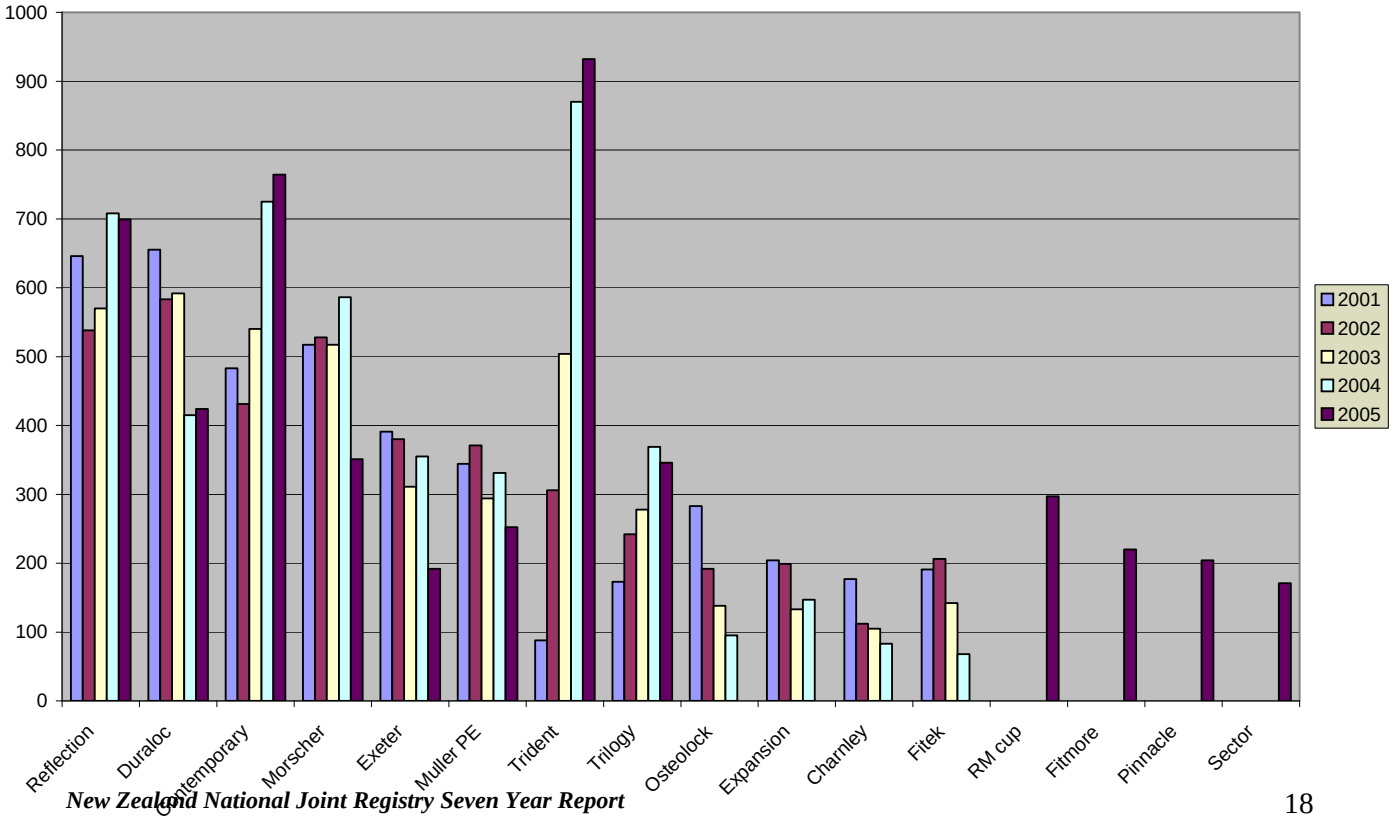
Compared to 2004 the RM cup has become popular at the expense of the Expansion cup



MOST USED FEMORAL COMPONENTS 5 YEARS 2001-2005



MOST USED ACETABULAR COMPONENTS 5 YEARS 2001-2005



Matching of the main femoral and acetabular components 1999-2005

Exeter/V40	Contemporary	3637
	Exeter	2356
	Trident	1388
	Osteolock	1106
	Duraloc	1067
	Morscher	959
	Trilogy	722
CLS	Morscher	1308
	Expansion	860
	Fitek	587
	Duraloc	571
	Fitmore	305
Spectron	Reflection	3525
	Duraloc	1001
	Morscher	204
Muller	Muller PE	1558
	Bevelled	610
Accolade	Trident	805
CPT	ZCA	404
MS 30	Morscher	650
	Muller	410
Corail	Duraloc	218
CCA	CCB	286
Summit	Pinnacle S2	156
Synergy	Reflection	295
Elite Plus	Elite Plus	361
	Charnley	332

Surgeon and hospital workload

Surgeons

In 2005, 172 surgeons performed 6311 total hip replacements, an average of 37 procedures per surgeon. This is the same average as 2004.

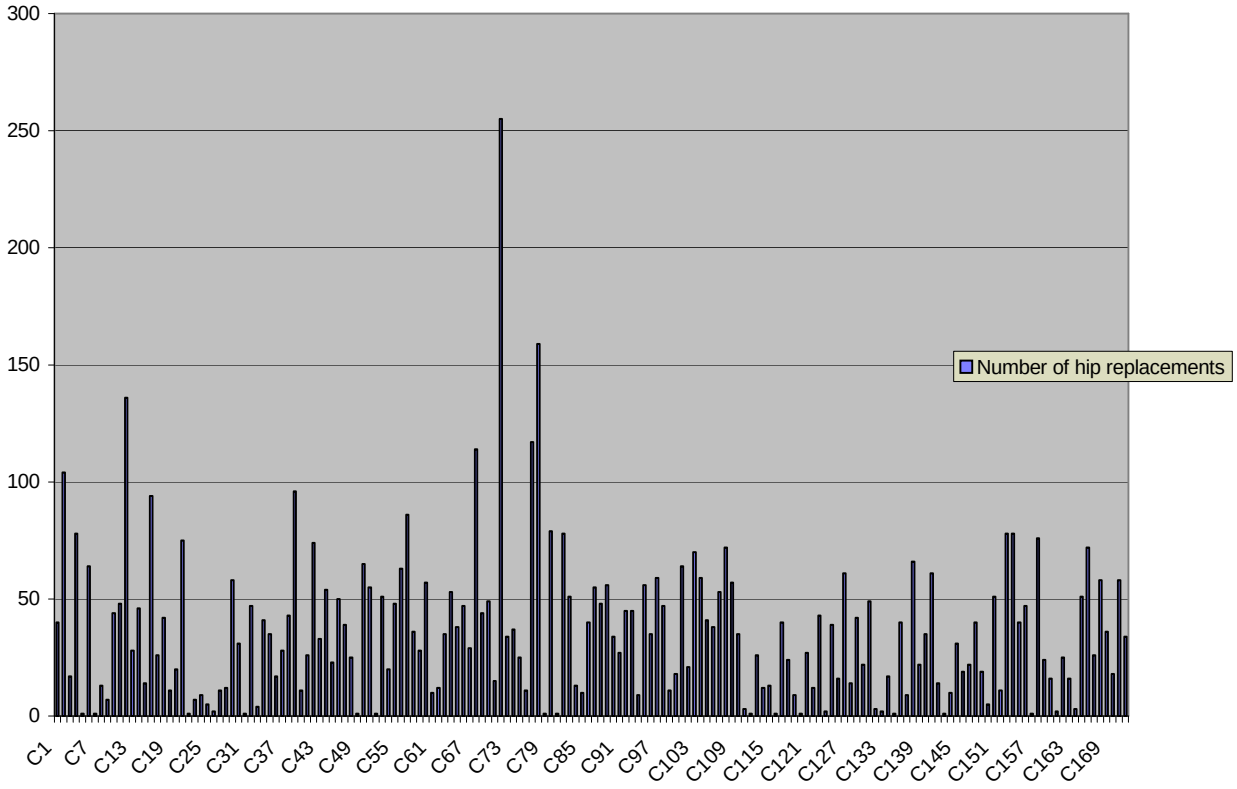
30 surgeons performed less than 10 procedures and 45 performed more than 50 procedures which is 11 more surgeons than last year.

Hospitals

In 2005 primary hip replacement was performed in 50 hospitals. 26 were public and 24 were private hospitals.

For 2005 the average number of total hip replacements per hospital was 126.

2005



Surgeons

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 are exchanged, removed, manipulated or added. It includes excision arthroplasty and amputation, but not soft tissue procedures. A two-stage procedure is registered as one revision.

Data analysis

For the seven-year period January 1999 – December 2005, there were 5487 revision hip procedures registered and includes 702 revisions of primary registered joints(see later) This is an additional 916 compared to last year's report.

The mean age for a revision hip replacement was 69.55, ranging from 18.47 – 97.72 years.

Revision hips

	Female	Male
Number	2731	2756
Percentage	49.80	50.20
Mean age	69.64	69.47
Maximum age	97.72	94.87
Minimum age	18.47	25.68

The ratio of revision hips to primary hips remains at 1:8

Reason for revision

Loosening acetabular comp.	2570
Loosening femoral comp.	1716
Dislocation	964
Pain	801
Deep infection	389
Fracture femur	300
Wear polyethylene	206
Osteolysis	136
Fracture femoral component	53
Fracture acetabular component	46
Other	51

There was often more than one reason listed on the data form and all were entered. Deep infection accounted for 7.0% of revisions, similar to last year.

Revision procedure

Change of acetabular comp.	2170
Change of all components	1754
Change of head	1531
Change of femoral comp.	1218
Change of liner	985

Revision approach

Posterior	3340
Lateral	1328
Anterior	256
Trochanteric osteotomy	223

Bone graft

Femoral allograft	450
Femoral autograft	74
Femoral synthetic	9
Acetabular allograft	416
Acetabular autograft	60
Acetabular synthetic	9

Cement

Femur cemented	1200
Antibiotic in cement	820
Acetabulum cemented	1412
Antibiotic in cement	990

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic 4654 (84%)

ASA Class

This was introduced at the beginning of 2005. There are now 464 / 915 revision hip procedures registered with the ASA class recorded.

ASA	No	%	Mean Age
1	45	10	58.73
2	248	53	68.01
3	156	34	74.51
4	15	3	76.67

There is a shift to higher ASA levels for revision hips compared to primary ones.

Operating theatre

Conventional	3759
Laminar flow	1598
Space suits	913

Operative time (skin to skin)

Mean	136 minutes
Minimum	26 minutes
Maximum	503 minutes
Standard deviation	62 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the data is for 2005 only.

Consultant	848
Advanced trainee supervised	43
Advanced trainee unsupervised	14
Basic trainee	4

Revision of Registered Primary Hip Arthroplasties

This section analyses data for revisions of primary hip procedures for the seven-year period.

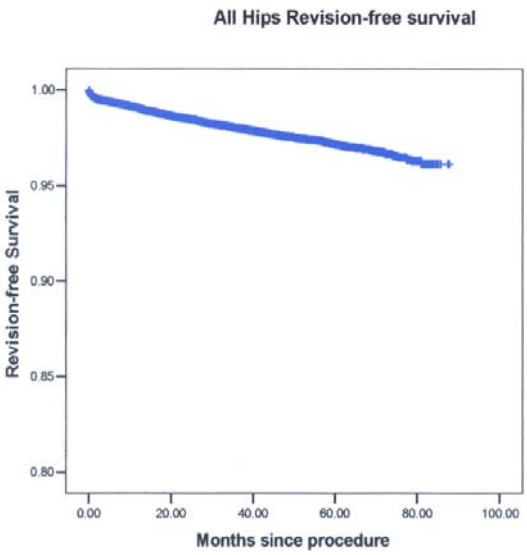
There were 702 revisions of the primary group of 35998 (1.95%) and 101 re-revisions, giving 803 revisions in total.
There has been one recorded revision of the 160 resurfacing arthroplasties.
The following analyses relate to the primary revision only.

Time to revision

Mean	606 days
Maximum	2469 days
Minimum	0 day
Standard deviation	597 days

Reason for revision

Dislocation	300
Loosening acetabular comp.	126
Deep infection	116
Loosening femoral component	85
Pain	68
Fracture femur	48
Other	35



Kaplan Meier survival analysis of all primary hips 1999-2005 with deceased patients censored at time of death. It demonstrates 99.7% revision free survival at one year 99.2% at two years, 98.8% at three years, 98.3% at four years, 97.9% at five years and 97.4% at six years. There are insufficient numbers for accurate 7 year survival analysis.

Analysis by time of the 4 main reasons for revision

Dislocation n = 300

< 6 months	141
6 months – 1 year	37
>1 – 2 years	63
>2 – 3 years	31
>3 – 4 years	17
>4 – 5 years	9
>5 – 6 years	1
>6 – 7 years	1

Dislocation was responsible for 43% of revisions and there has been a steady decrease over the last few years.

Loosening acetabular component n = 126

< 6 months	27
6 months – 1 year	10
>1 – 2 years	26
> 2 – 3 years	19
>3 – 4 years	18
> 4 – 5 years	13
> 5 – 6 years	10
> 6 – 7 years	3

Loosening femoral component n = 85

< 6 months	9
6 months – 1 year	9
>1 – 2 years	18
> 2 – 3 years	13
>3 – 4 years	11
> 4 – 5 years	12
> 5 – 6 years	10
> 6 – 7 years	3

Deep infection n = 116

< 6 months	25
6 months – 1 year	17
>1 – 2 years	30
> 2 – 3 years	22
>3 – 4 years	11
> 4 – 5 years	8
> 5 – 6 years	2
> 6 – 7 years	1

Deep infection was the reason for 16% of revisions. Over the 7 year period 0.32% of primary hips have

been revised because of deep infections and as with dislocation revision there has been a steady decrease.

Analysis of primary approach and subsequent dislocation

Posterior approach was compared to the combined group of anterior, lateral and trochanteric approaches. There were 209 revisions out of the total of 21496 posterior approaches (0.97%). For the other 12293 approaches there were 64 revisions (0.52%). Both of these figures are similar to last year's report. (See also patient reported dislocations)

Theatre type for primary procedures and deep infection

	Deep infection	Primary numbers	%
Conventional	81	24189	0.3
Conventional and space suits	4	1013	0.4
Laminar flow	17	5598	0.3
Laminar flow and space suits	14	4536	0.3

As noted in previous reports there would appear to be no advantage to using laminar flow theatres ± space suits to reduce the incidence of deep infection.

Individual Component Revision Percentages

Femoral	%	Acetabular	%
Exeter V40	0.9	Trilogy	0.6
Charnley	1.2	Pinnacle	0.6
Elite Plus	1.4	Muller PE	0.9
Muller	1.6	Fitek	1.1
Accolade	1.8	Trident	1.1
MS30	1.9	Charnley	1.5
Versys	1.9	Fitmore	1.5
CPT	2.0	Contemporary	1.6
Spectron	2.0	Reflection	1.6
Synergy	2.2	Bevelled	1.7
CLS	2.3	Expansion	1.9
ABG	2.5	Exeter	2.0
Exeter	2.7	Duraloc	2.1
CCA	2.9	Morscher	2.1
S Rom	3.1	Osteolock	3.4

These revision percentages have to be viewed with caution as often a component is revised not because it has failed but because it is incompatible with the replacement for the other failed component. The Osteolock cup and perhaps the CCA femur still need to be monitored.

Cemented components on the whole continue to do better than uncemented.

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS AND FIVE-YEARS POST SURGERY

Questionnaires at six months post surgery

At 6-months post surgery patients are sent the Oxford-12 questionnaire. There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability.
This year we have grouped the questionnaire responses based on the scoring system published by Field, Cronin and Singh (See appendix 2).

Category 1	12 – 17 (excellent)
Category 2	18 – 23 (very good)
Category 3	24 – 29 (good)
Category 4	30 – 35 (fair)
Category 5	36 – 41 (poor)
Category 6	> 41 (very poor)

For the 7- year period, and as at July 2006, there were 15414 primary hip questionnaire responses registered at six months post surgery.
The mean hip score was 19.27 (standard deviation 7.50, range 12 – 60)

Scoring	12 - 17	8154
Scoring	18 - 23	3765
Scoring	24 - 29	1881
Scoring	30 - 35	939
Scoring	36 - 41	422
Scoring	> 41	253

At 6- months post surgery, 77% had an excellent or very good score.

Questionnaires at five years post surgery

A random selection of patients who had a registered 6- month questionnaire, and who had not had revision surgery were sent a further questionnaire at 5 years post surgery with the aim of achieving 1000 returns per year.
This dataset represents sequential post surgery Oxford hip scores for individual patients.

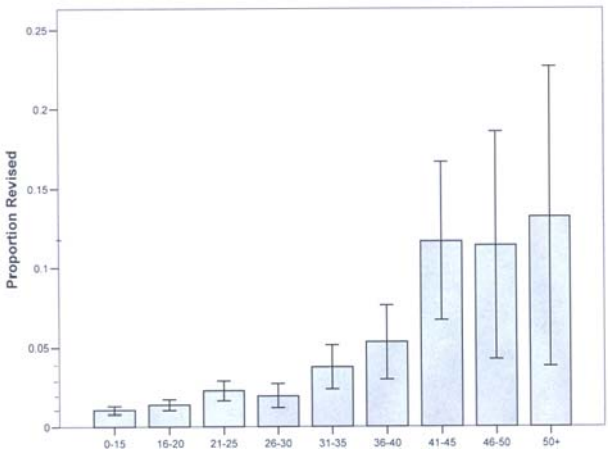
The number of patients with 6 month and five year scores was 1694.
At 6 months 81% of this cohort of patients achieved an excellent or very good score with a mean of 18.47.
At 5 years 85% of this cohort achieved an excellent or very good score with a mean of 17.47

The group of patients who had 6-month primary scores and subsequent revision scores were also analysed. The number with both these scores was 267.
At 6 months only 55 % of this group achieved an excellent or very good score. The mean was 24.65.
The revision scores for this group had a mean of 23.72 and only 57% achieved an excellent or very good score.

Relationship of Oxford Score to Early Revision

In view of the significantly higher six months mean for primary joints which have been revised between six months and seven years post surgery (23.72 versus 19.27) it was decided to investigate whether the six month Oxford score could be used as a predictor of revision risk. This was performed in two ways. Firstly by plotting the patient six month scores in groups of 5 against the proportion of hips revised for that same group it is readily seen that higher Oxford Scores increase the risk of revision. For example a patient with a score between 16 and 20 has a 1.5% risk of revision whereas a patient with a score between 41 and 45 has an 11.5% risk of revision within six and a half years.

Oxford Score versus Risk of Revision for Hips



Oxford Score Groups

Secondly by using logistic regression it demonstrated that for every one unit increase in the Oxford score there was a 7% increase in the risk of revision.

Thus the positive relationship between the Oxford score and risk of revision may be useful in determining which patients should have longer term follow-up.

Analysis of the individual questions at 6 months and 5 years post surgery

Analysis of the individual questions showed that the most common problems occurred with limping (Q10) putting on socks (Q4) and pain in the operated hip (Q1). These did not greatly change over the 5 year period.

Percentage scoring of 4 or 5 for each question out of the groups of 15415 primary hip responses at 6 months and 1694 at 5 years.

		% 6/12	% 5 Yrs
1	Moderate or severe pain from the operated hip	6.3	6.4
2	Only able to walk around the house or unable to walk before pain becomes severe	4.4	2.7
3	Extreme difficulty or impossible to get in and out of a car or public transport	2.0	1.9
4	Extreme difficulty or impossible to put on a pair of socks	9.0	5.8
5	Extreme difficulty or impossible to do the household shopping on your own	3.8	3.1
6	Extreme difficulty or impossible to wash and dry yourself	1.8	1.4
7	Pain interfering greatly or totally with your work	4.1	3.4
8	Very painful or unbearable to stand up from a chair after a meal	2.0	1.8
9	Sudden severe pain most or all of the time	1.3	1.4
10	Limping most or every day	13.3	9.7
11	Extreme difficulty or impossible to climb a flight of stairs	3.7	4.0
12	Pain from your hip ion bed most or every nights	5.0	2.5

Complication data from the questionnaires

Each questionnaire has a section to report hospitalisation for dislocation, deep infection, DVT, pulmonary embolism or any other reason.

Analysis of the 15415 questionnaires gave the following numbers of self reported dislocation, deep infection, deep vein thrombosis and pulmonary embolus for the seven-year period.

	Number	Registered revision
Dislocation	258	58
Infection	163	26
DVT	69	N/A
PE	21	N/A

Dislocation: The number of patient reported dislocations within the first 6 months(258)gives an incidence of 1.6% of which 58 (0.37%) have been revised. This figure is very similar to the Registry recorded dislocation revision rate in the first 6mths of 0.39% The revision to dislocation ratio is 1 to 4.45. Seventy three percent of the patient reported dislocations were from the posterior approach, (64% of hip arthroplasty is via the posterior approach).

Infection: the infection information received from the patients questionnaire does not distinguish between superficial and deep infection and It has to be assumed that the majority were superficial, as only 16% subsequently had a revision.

DVT &PE the recorded number of DVTs is obviously far too low and the same probably applies to the PE incidence of 0.13 % even although it is a significant event for most people.

Revision hip questionnaire responses

There were 3467 revision hip responses with only 31% of these achieving an excellent score. This group includes all revision hip procedures. The mean revision hip score was 24.16 (standard deviation 9.58, range 12 – 59)

KNEE ARTHROPLASTY

PRIMARY KNEE ARTHROPLASTY

The seven-year report analyses data for the period January 1999 – December 2005. There were 23565 primary knee procedures registered, an additional 5023 compared to last year's report. Included in the 23565 primary knees are 47 patello-femoral prostheses with 17 registered during 2005

1999	2429
2000	3013
2001	3060
2002	2894
2003	3048
2004	4098
2005	5023

There has been a 23% increase in 2005 compared to 2004 and although for 2005 the ratio of hips and knees was 55:44, overall it remains at 60:40

DATA ANALYSIS

Age and Sex Distribution

All Knee Arthroplasties

	Female	Male
Number	12324	11241
Percentage	52.30	47.70
Mean age	69.28	68.60
Maximum age	100.49	97.32
Minimum age	13.57	10.34
Standard dev.	10.08	9.42

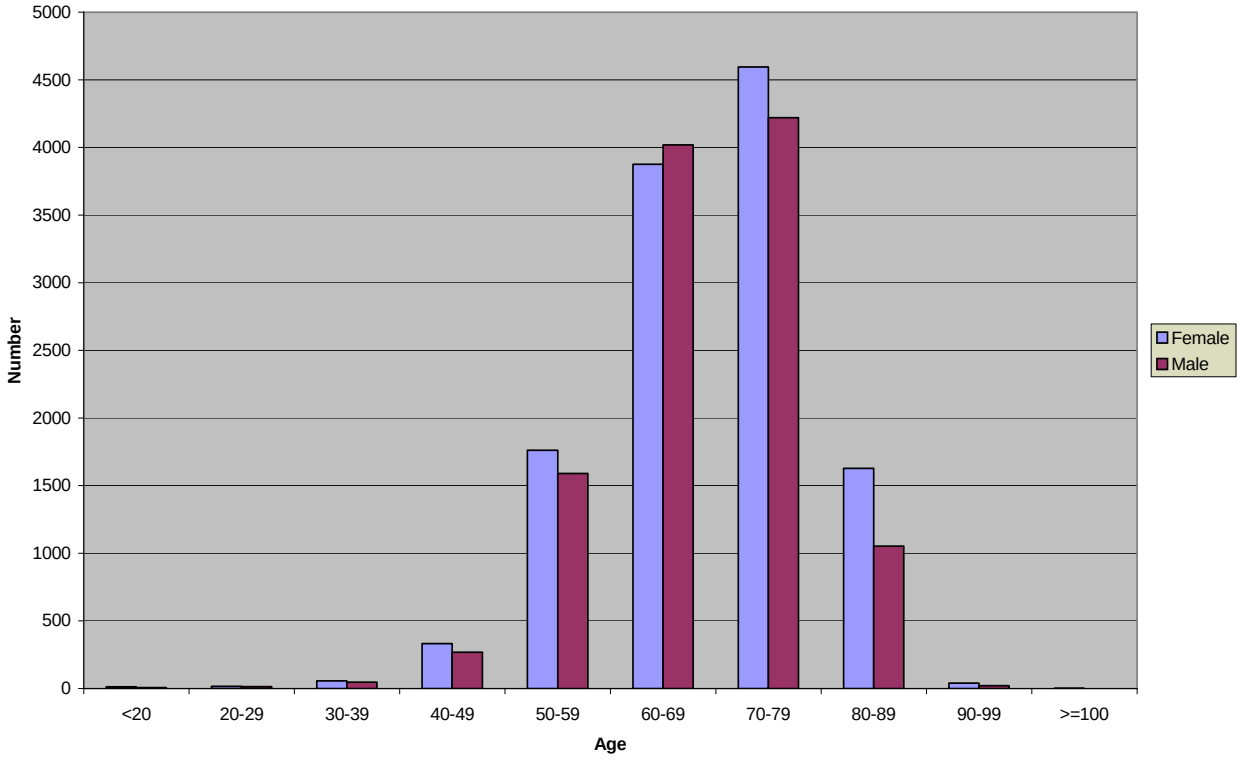
Conventional Knee Arthroplasty

	Female	Male
Number	12287	11231
Percentage	52.14	47.86
Mean age	69.29	68.60
Maximum age	100.49	97.32
Minimum age	13.57	10.34
Standard dev.	10.07	9.42

Patello-femoral Arthroplasty

	Female	Male
Number	37	10
Percentage	78.72	21.28
Mean age	65.15	65.12
Maximum age	85.78	78.62
Minimum age	36.51	53.20
Standard dev.	9.90	7.07

Age Band Distribution over 7 years



Previous operation	
None	19454
Menisectomy	2275
Osteotomy	543
Arthroscopy/debridement	425
Ligament reconstruction	222
Internal fixation for juxtarticular fracture	164
Patellectomy	104
Synovectomy	57
Removal of loose body	17
Other	38

Diagnosis	
Osteoarthritis	21541
Rheumatoid arthritis	872
Post fracture	281
Other inflammatory	253
Post ligament disruption/reconstruction	160
Avascular necrosis	88
Tumour	25
Other	33

Approach/Technique	
Medial parapatellar	20513
Variants of medial parapatellar	780
Lateral parapatellar	517
Image guided surgery	202
Minimally invasive surgery	26

Image guided surgery was added to the updated forms at the beginning of 2004 and accounts for 0.3% of total for 2005. It will be interesting to see how this percentage grows. M.I.S. has risen by just 19 in the last year.

Bone graft	
Femoral autograft	22
Femoral allograft	5
Femoral synthetic	1
Tibial autograft	19
Tibial allograft	6

Cement

Femur cemented	20564	87%
Antibiotic in cement	11899	58%
Tibia cemented	21640	92%
Antibiotic in cement	12305	57%

The use of antibiotic impregnated cement is gradually increasing, having risen from 46% in 5yr report. See also abstract in appendix re infection and antibiotic cement.

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic	22136	94%

A cephalosporin was used in 96% of knee arthroplasties.

Operating theatre

Conventional	15897
Laminar flow	7369
Space suits	4316

The percentage of surgery carried out in laminar flow theatres has increased from 24% in 5yr report to 32 % and the use of space suits doubled from 14 to 27%. This is despite the findings from the registry that use of these does not reduce the incidence of early infection. *(See revision section)*

ASA Class

This was introduced with the updated forms at the beginning of 2005 in order to assess patients co-morbidity.
There are 2517/5021 (50%) primary knee procedures with the ASA class recorded.

Definition

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

ASA	No	%	Mean Age
1	285	11.03	63.07
2	1566	62.2	68.01
3	650	25.8	71.04
4	16	0.6	75.81

ASA gradings Public vs Private Hospitals

ASA	% Public	% Private
1	6.5	17
2	62	62
3	31	20
4	1	0.5

As with the hip patients those with greater co-morbidities tend to have their surgery in the public hospitals.

Operative time (skin to skin)

Mean	85 minutes
Standard deviation	26 minutes
Minimum	25 minutes
Maximum	420 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the following data is for 2005 only.

Consultant	4431
Advanced trainee supervised	246
Advanced trainee unsupervised	29
Basic trainee	121

Patellar resurfacing

7504 (32%) of the registered procedures were recorded with the patella resurfaced and 16061 (68%) were not resurfaced. These figures are similar to last year's report but see B Tietjens abstract in appendix.

Prosthesis usage

Conventional primary knees

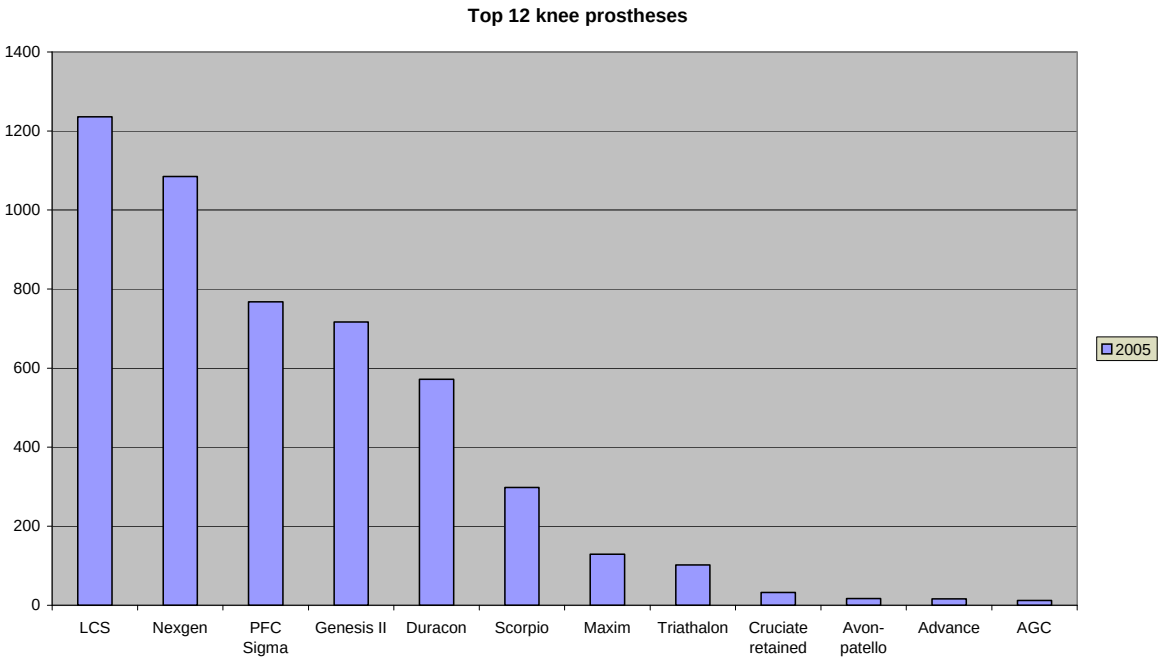
Top 12 knee prostheses used in 2005

LCS	1236
Nexgen	1085
PFC Sigma	768
Genesis II	717
Duracon	572
Scorpio	298
Maxim	129
Triathalon	102
Cruciate retained	32
Avon-patello	17
Advance	16
AGC	12

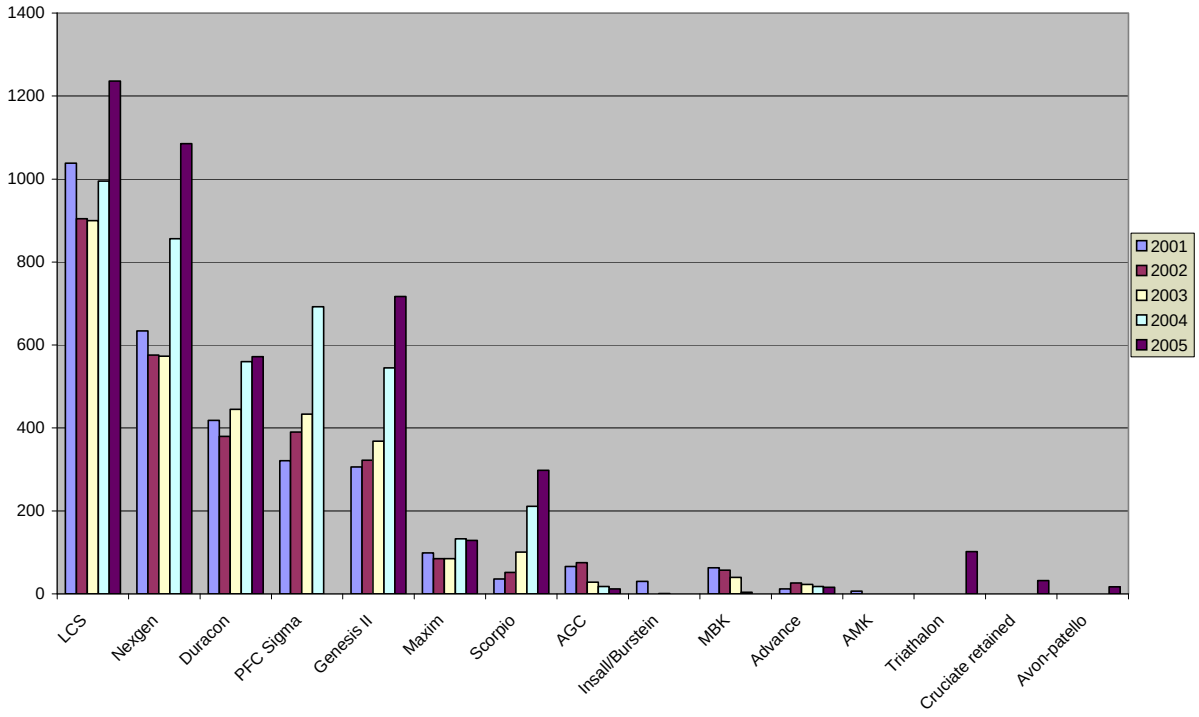
Patello-femoral

Avon-patello	45
Mod 3	1
Themis	1

There are 47 patello-femoral procedures registered to 23 surgeons. Avon- patello is the most common prosthesis at 96% of the total.



MOST USED KNEE PROSTHESES 5 YEAR PERIOD 2001-2005



Outside the “big 5” the Scorpio continues its upward march and the Triathalon, Cruciate retained and Avon patello make their first appearance in the enlarged graph.

Surgeon and hospital workload

Surgeons

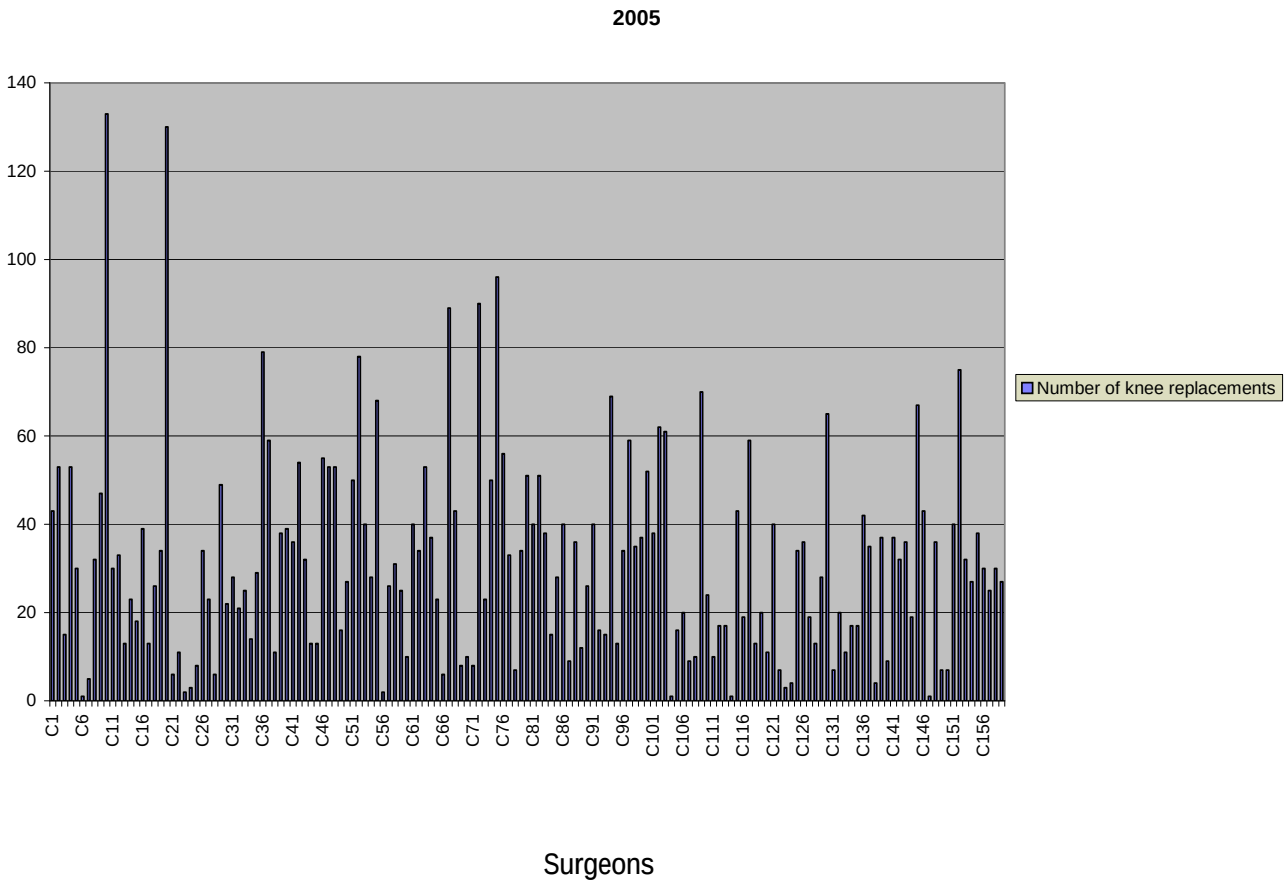
In 2005, 159 surgeons performed 5023 total knee replacements, an average of 32 procedures per surgeon. This is an increase of 23% over last year and is consistent with the increase in knee registrations

25 surgeons performed less than 10 procedures and 38 performed more than 40 procedures, 9 more surgeons that last year.

Hospitals

In 2005 primary knee replacement was performed in 49 hospitals. 25 were public and 24 were private hospitals.

For 2005 the average number of total knee replacements per hospital was 103.



REVISION KNEE ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced knee joint during which one or more of the components are exchanged, removed, manipulated or added. It includes arthrodesis or amputation, but not soft tissue procedures. A two or more staged procedure is registered as one revision.

Data analysis

For the seven-year period January 1999 – December 2005, 2149 revision knee procedures had been registered. This is an additional 413 compared to last year's report.

The average age for a female with a revision knee replacement was 70.67 and a male was 70.09 years.

Revision knees

	Female	Male
Number	1035	1114
Percentage	48.16	51.84
Mean age	70.67	70.09
Maximum age	95.79	98.39
Minimum age	20.66	15.49
Standard dev.	10.27	9.75

The ratio of revision knees to primary knees is 1:12

Reason for revision

Pain	690
Loosening tibial component	664
Loosening femoral component	466
Deep infection	274
Wear tibial	210
Loosening patellar	115
Implant fracture	109
Instability	94
Bearing dislocation	40
Fracture tibia	39
Progression of disease	32
Stiffness	26
Fracture femur	24
Dislocation	23
Osteolysis	18
Malalignment	14
Other	46

Often more than one reason for revision listed and all entered. Deep infection accounted for 12.8% and pain was at least one of the reasons for revision in 32 %

Revision approach

Medial	1882
Lateral	59
Other	59
Image guided	8
Minimally invasive	4

Bone graft

Femoral allograft	32
Femoral autograft	18
Femoral synthetic	2
Tibial allograft	23
Tibial autograft	21
Tibial synthetic	2

Cement

Femur cemented	1276	
Antibiotic in cement	931	(73%)
Tibia cemented	1396	
Antibiotic in cement	1011	(72%)
Patella cemented	594	
Antibiotic in cement	381	(64%)

Systemic antibiotic prophylaxis

Patient procedures receiving at least one systemic antibiotic	1811	(84%)

ASA Class

This was introduced at the beginning of 2005. There are now 232 / 413 revision knee procedures registered with the ASA class recorded.

ASA	No	%	Mean Age
1	20	9	58.60
2	133	57	70.71
3	74	32	73.22
4	5	2	79.20

As would be expected a shift to higher ASA classes when compared to primary procedures.

Operating theatre

Conventional	1636
Laminar flow	478
Space suits	334

Operative time (skin to skin)

Mean	121 minutes
Minimum	17 minutes
Maximum	446 minutes
Standard deviation	59 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the data is for 2005 only.

Consultant	399
Advanced trainee supervised	6
Advanced trainee unsupervised	2
Basic trainee	1

Revision of Registered Primary Knee Arthroplasties

This section analyses data for revisions of primary knee procedures for the seven-year period.

There were 416 revisions of the primary group of 23565 (1.77%) and 41 re-revisions, giving 457 revisions in total.
Included in this group are two patello-femoral prostheses, both revised to conventional primary knee replacements.
The following data relates to first revisions only.

Time to revision

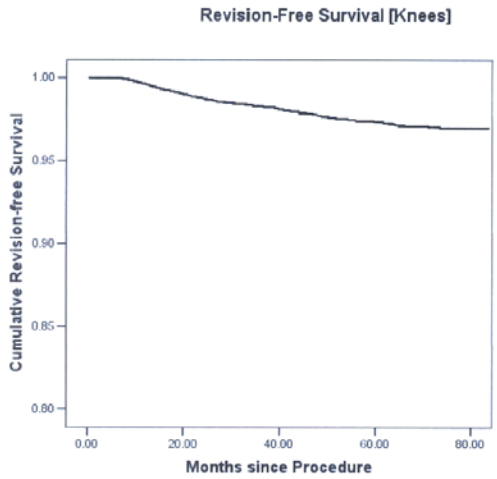
Mean	696 days
Maximum	2324 days
Minimum	1 day
Standard deviation	509 days

Reason for revision

Pain	145
Deep infection	102
Patella loosening or addition	97
Loosening tibial component	86
Loosening femoral component	48
Instability	36
Stiffness	13
Dislocation component	13
Malalignment	9
Wear component	7
Fracture femur	6
Fracture tibia	5
Implant breakage tibial	5
Other	17

Deep infection responsible for 24.5 % of revisions and 0.4% of primary knees have been revised due to deep infection. Pain was at least partly responsible for revision in 35%

Survival Curve



Kaplan Meier survival analysis of all primary knees 1999-2005 with deceased patients censored at time of death. It demonstrates 99.7% revision free survival at one year 98.8% at two years, 98.3% at three years, 97.8% at four years, 97.4% at five years and 97.0% at six years. There are insufficient numbers for accurate 7 year survival analysis.

Analysis by time of the 4 main reasons for revision

Pain n = 145

< 6 months	9
6 months – 1 year	27
>1 – 2 years	55
>2 – 3 years	24
>3 – 4 years	17
>4 – 5 years	11
>5 – 6 years	2
>6 – 7 years	0

Deep infection n = 102

< 6 months	17
6 months – 1 year	26
>1 – 2 years	29
>2 – 3 years	12
>3 – 4 years	12
>4 – 5 years	4
>5 – 6 years	1
>6 – 7 years	1

Loosening tibial component n = 86

< 6 months	4
6 months – 1 year	10
>1 – 2 years	16
>2 – 3 years	24
>3 – 4 years	14
>4 – 5 years	11
>5 – 6 years	6
>6 – 7 years	1

Loosening femoral component n = 48

< 6 months	0
6 months – 1 year	7
>1 – 2 years	11
>2 – 3 years	7
>3 – 4 years	9
>4 – 5 years	9
>5 – 6 years	5
>6 – 7 years	0

Original knee prostheses revised

	No	%
Maxim	4	0.6
Advance	2	0.9
Duracon	35	1.1
PFC Sigma	38	1.2
AGC	5	1.4
Nexgen	76	1.6
Genesis II	41	1.6
Scorpio	13	1.8
LCS	164	2.2
MBK	7	3.1
Avon-patello	2	4.4
Insall/Burstein	26	10.4
Femoral module	1	
OGS	1	
AMK	1	

The stand out is the I.B knee but fortunately none are currently being implanted. The MBK up from1.9% last year & A-P protheses need to be monitored.

Subsequent Patellar resurfacing

As noted previously, 68%(16061) of the 23565 primary knees registered were not resurfaced and 32% (7504) were resurfaced. In the group that was not resurfaced 65 (0.4%) had the patella later resurfaced as the only revision procedure and a further 29 had the patella resurfaced as part of other component revision. *(See also B Tietjens abstract in appendix).*

Theatre type for primary procedures and deep infection

	Deep infection	Primary numbers	%
Conventional	70	15099	0.4
Conventional and space suits	-	780	0.0
Laminar flow	13	3919	0.3
Laminar flow and space suits	18	3428	0.5

On the basis of the above there would appear to be no advantage to using Laminer flow theatres $\pm$ space suits to reduce the incidence of deep infection.

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS AND FIVE-YEARS POST SURGERY

Questionnaires at six-months post surgery

At six-month post surgery patients are sent the Oxford-12 questionnaire. There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability.
This year we have grouped the questionnaire responses into six categories, based on the scoring system published by Field Cronin and Singh (See appendix 2)

Category 1 12 - 17 (excellent)
Category 2 18 - 23 (very good)
Category 3 24 – 29 (good)
Category 4 30 – 35 (fair)
Category 5 36 – 41 (poor)
Category 6 > 41 (very poor)

For the seven-year period and as at July 2006, there were 11367 primary knee questionnaire responses registered at six-months post surgery.
The mean knee score was 23.06 (standard deviation 8.38, range 12 – 60)

Scoring	12 – 17	3431
Scoring	18 – 23	3446
Scoring	24 – 29	2171
Scoring	30 – 35	1222
Scoring	36 – 41	686
Scoring	> 41	411

At six-months post surgery, 61% had an excellent or very good score.

Questionnaires at five years post surgery

A random selection of patients who had a registered six-month questionnaire and who had not had revision surgery have been sent a further questionnaire at five -years post surgery. The aim is to register a minimum of 1000 5 year scores per year

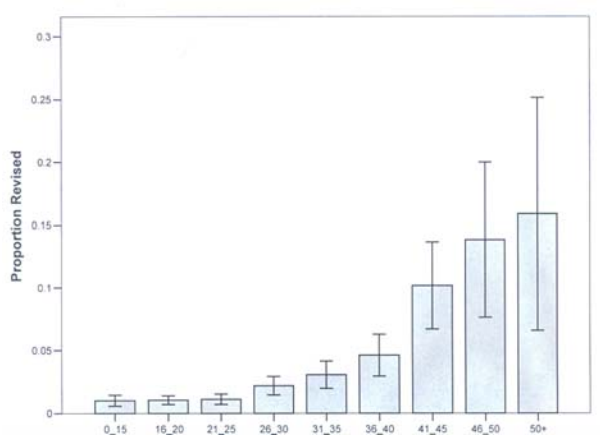
The number of patients with six-month and five year scores was 1736.
At six- months post surgery, 61% of these patients achieved an excellent or very good score and had a mean of 22.73.
At five-years post surgery, 69% of these same patients achieved an excellent or very good score and had a mean of 21.24.
The group of patients who had six -month primary scores and subsequent 6 month revision scores were also analysed. The number with both these scores was 186. At six- months post surgery, only 29% of this group achieved an excellent or very good score with a mean of 30.88.
The revision scores for this group had a mean of 29.89 and 30% achieved an excellent or very good score.

Relationship of Oxford Score to Early Revision

In view of the significantly higher six months mean for primary joints which have been revised between six months and seven years post surgery (23.72 versus 19.27) it was decided to investigate whether the six month Oxford score could be used as a predictor of revision risk.

This was performed in two ways. Firstly by plotting the patient six month scores in groups of 5 against the proportion of knees revised for that same group it is readily seen that higher Oxford scores increase the risk of revision. For example a patient with a score between 16 and 20 has a 1.0% risk of revision whereas a patient with a score between 46 and 50 has an 14.0% risk of revision within six and a half years.

Oxford Score versus Risk of Revision for Knees



Oxford Score Groups

Secondly by using logistic regression it was demonstrated that for every one unit increase in the Oxford Score there was a 9% increase in the risk of revision.

Thus the positive relationship between the Oxford Score and risk of revision may be useful in determining which patients should have longer term follow-up.

Analysis of the individual questions at six-months and 5 years post surgery

Analysis of the individual questions showed that the most common problems occurred with kneeling (Q4), pain in the operated knee (Q1) and limping (Q10). These did not greatly change over the 5 year period.

Percentage scoring 4 or 5 for each question out of the group of 11367 primary knee responses at 6 months and 1736 at 5 years.

		6 m %	5 yr %
1	Moderate or severe pain from the operated knee	13.6	10.9
2	Only able to walk around the house or unable to walk before pain becomes severe	6.0	4.8
3	Extreme difficulty or impossible to get in and out of a car or public transport	5.0	5.6
4	Extreme difficulty or impossible to kneel down and get up afterwards	43.9	46.0
5	Extreme difficulty or impossible to do the	4.5	7.0

	household shopping on your own		
6	Extreme difficulty or impossible to wash and dry yourself	1.4	2.5
7	Pain interfering greatly or totally with your work	6.0	5.5
8	Very painful or unbearable to stand up from a chair after a meal	4.0	3.1
9	Most of the time or always feeling that the knee might suddenly "give way"	2.4	2.4
10	Limping most or every day	12.3	10.7
11	Extreme difficulty or impossible to climb a flight of stairs	8.2	9.3
12	Pain from your knee in bed most or every nights	9.8	5.0

Complication data from the questionnaires

Each questionnaire has a section to report hospitalisation for dislocation, infection, DVT, pulmonary embolism or any other reason. Analysis of the 11367 questionnaires gave the following numbers of self-reported dislocation, infection, DVT and pulmonary embolus for the seven-year period.

	Number	Registered revision
Infection	303	20
Dislocation	73	5
Manipulation	120	N/A
DVT	20	N/A
PE	12	N/A

Infection: as with the hip questionnaires there is no differentiation between superficial and deep infection. Three patients advised that they had had knee washouts and 20 are recorded as having had revisions for deep infection within 6 months of the primary procedure.

Dislocation:73 patients reported dislocation but from the low revision number it is assumed that most patients are reporting a feeling of instability.

MUA: the reported number gives an incidence of 1% which is the same as the last report.

PE: the reported incidence is 0.11% the same as last year & similar to the hip incidence but probably low.

Revision knee questionnaire responses

There were 1301 revision knee responses with only 41% achieving an excellent or very good score. This group includes all revision knee responses. The mean revision knee score was 27.62 (standard deviation 10.13, range 12 – 58).

UNICOMPARTMENTAL KNEE ARTHROPLASTY

PRIMARY UNICOMPARTMENTAL ARTHROPLASTY

The six-year report analyses data for the period January 2000 – December 2005. There were 3122 unicompartmental knee procedures registered, an additional 557 compared to last year's report.

2000	340
2001	430
2002	533
2003	628
2004	634
2005	557

Overall a 12% decrease on 2005 compared to 2004 and UCAs accounted for 12% of all primary knee arthroplasties (15% 2004, 17% 2003)

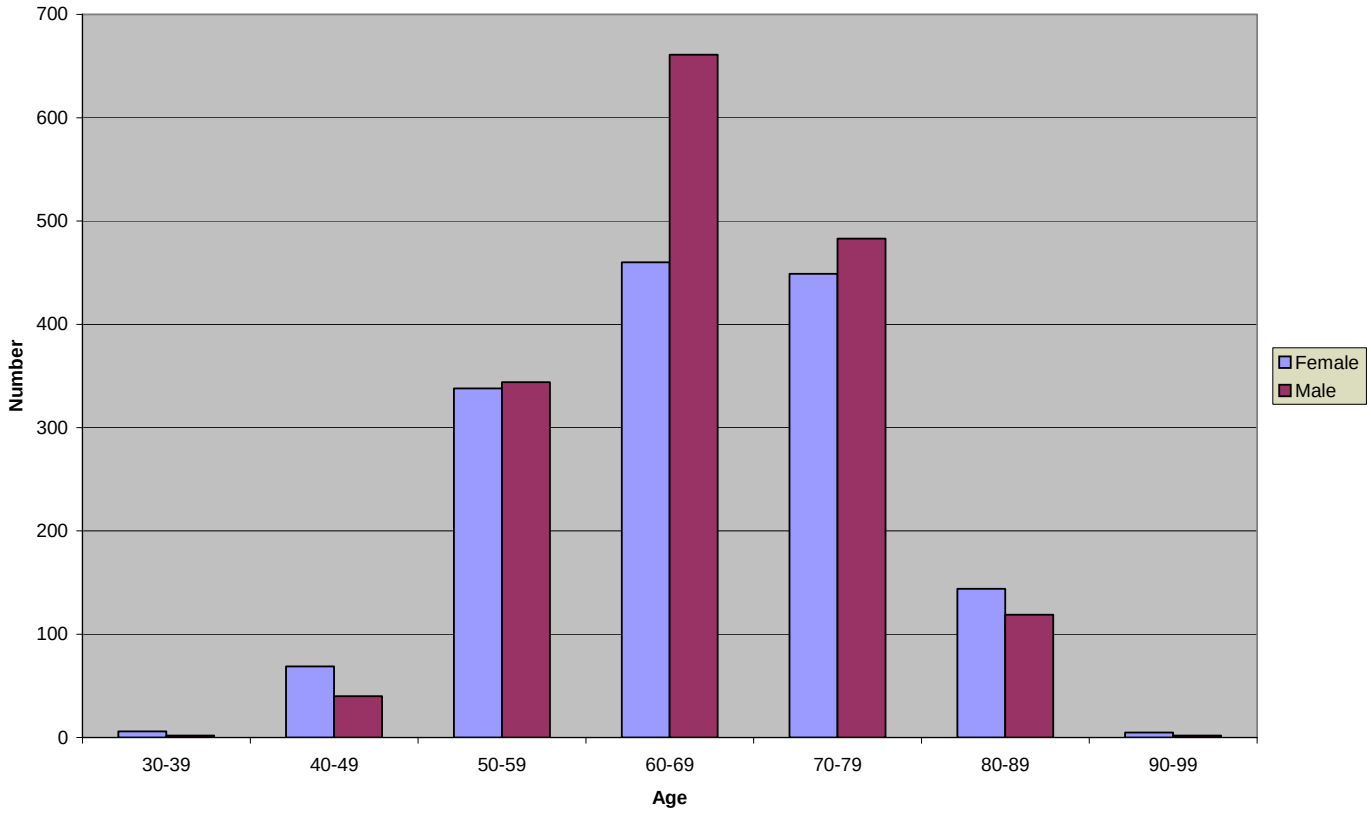
DATA ANALYSIS

Age and Sex Distribution

The average age for a female with a unicompartmental knee arthroplasty is 66.79 and for a male is 66.68 similar to last year's report.

	Female	Male
Number	1471	1651
Percentage	47.11	52.89
Mean age	66.79	66.68
Maximum age	94.71	93.42
Minimum age	35.19	35.24
Standard dev.	10.24	8.99

Age band distribution over 6 years



Previous operation

None	2471
Menisectomy	452
Arthroscopy/debridement	154
Ligament reconstruction	10
Patellectomy	9
Internal fixation	7
Osteotomy	7
Arthrotomy	2
Removal of loose body	1
Synovectomy	1

Diagnosis

Osteoarthritis	3004
Avascular necrosis	30
Other inflammatory	13
Post ligament disruption	13
Post fracture	9
Rheumatoid arthritis	7
Other	3

Approach/Technique

Medial	2652
Minimally invasive surgery	429
Other	121
Lateral	74
Image guided surgery	2

Image guided surgery was added to the updated forms at the beginning of 2005 MIS has increased by 63% in the last year and was used for 30% of UKA's in 2005.

Cement

Femur cemented	2993	96%
Antibiotic in cement	1635	55%
Tibia cemented	2997	96%
Antibiotic in cement	1634	55%

See abstract re infection and antibiotic in cement in appendix.

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic	3005	96%

Operating theatre

Conventional	2533
Laminar flow	534
Space suits	515

ASA Class

This was introduced with the updated forms at the beginning of 2005.
There are 316/557 (57%) unicompartmental knee procedures with the ASA class recorded.

Definition

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	No	%	Mean Age
1	77	24	62.43
2	185	59	66.19
3	53	17	70.04
4	1	0.3	77.00

As would be expected a higher percentage of ASA 1 and 2 (83%) compared to TKA (73%).

Operative time	(skin to skin)
Mean	83 minutes
Standard deviation	24 minutes
Minimum	23 minutes
Maximum	195 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the following data is for 2005 only.

Consultant	2940
Advanced trainee supervised	17
Basic trainee	5
Advanced trainee unsupervised	4

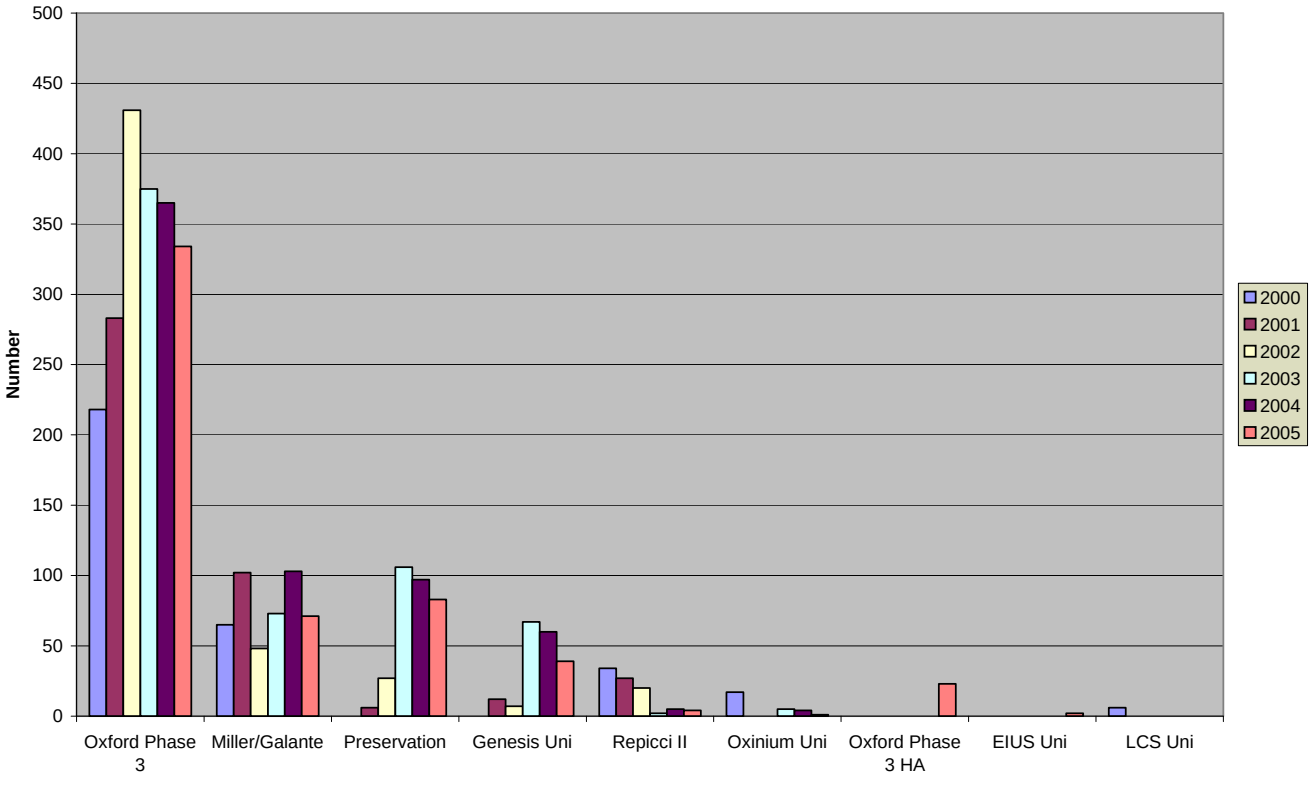
Prosthesis usage

Unicompartmental knee prostheses used in 2005

Oxford Phase 3	334
Preservation	83
Miller/Galante	71
Genesis Uni	39
Oxford Phase 3 HA	23
Repicci	4
EIUS Uni	2
Oxinium Uni	1

The Oxford Phase 3HA and the EIUS Uni have made first appearances and no LCS unis implanted in 2005

MOST USED UNICOMPARTMENTAL KNEE PROSTHESES 2000 – 2005



Surgeon and hospital workload

Surgeons

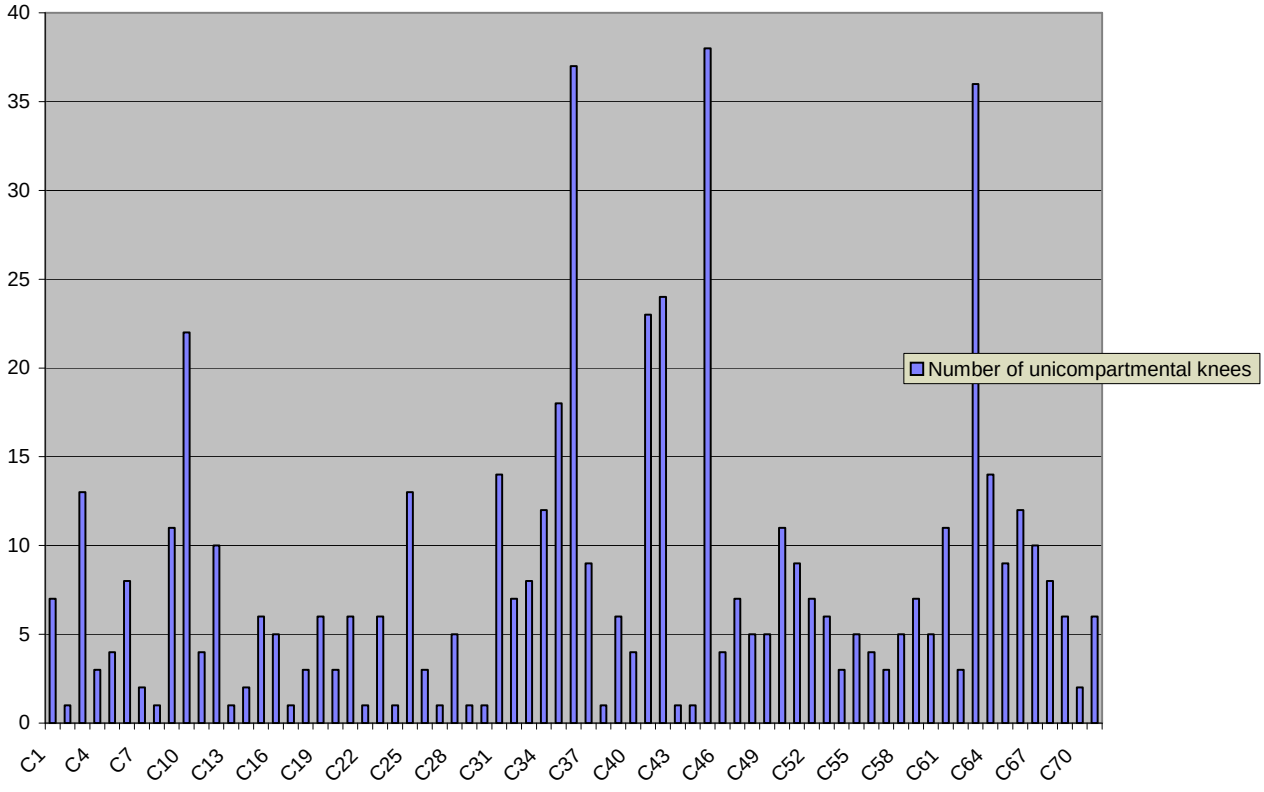
In 2005, 71 surgeons performed 557 unicompartmental knee replacements, an average of 8 procedures per surgeon.
27 surgeons performed less than 5 procedures and 7 performed more than 15 procedures.

The gradual decline in the number of surgeons doing UKAs continues as does those doing < 5 per year.

Hospitals

In 2005 unicompartmental knee replacement was performed in 40 hospitals. 18 were public and 22 were private.
For 2005 the average number of unicompartmental knee replacements per hospital was 14.

2005



Surgeons

REVISION OF REGISTERED UNICOMPARTMENTAL KNEE ARTHROPLASTY

This section analyses the data for revision of unicompartmental knee arthroplasty over the six-year period.

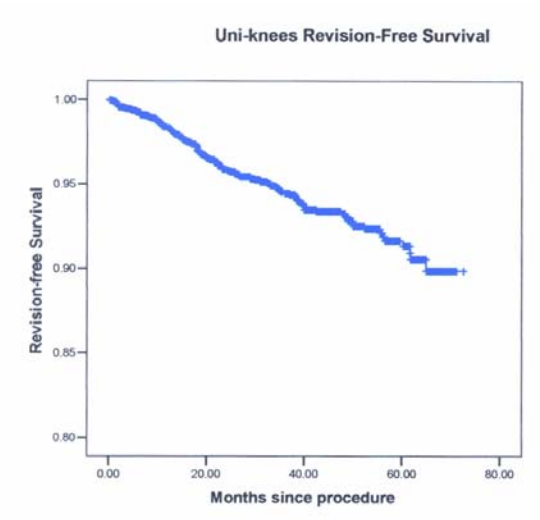
There were 149 revisions of the 3122 registered unicompartmental knees (4.77%) and 12 re-revisions, giving a total of 161 revisions.
121 of the 149 (81%) were revised to total knee replacements.

Time to revision	
Mean	643 days
Maximum	1980 days
Minimum	10 days
Standard deviation	465 days

Reason for revision	
Pain	73
Loosening tibial component	41
Loosening femoral component	23
Bearing dislocation	11
Progression of disease	11
Deep infection	9
Fracture tibia	8
Wear tibial	6
Other	7

As with TKA pain at least in part is a major reason for revision and deep infection is responsible for 6.0% of revisions. Overall 0.25% of knees have been revised because of deep infection. These are significantly lower figures compared to TKA.

Survival Curve



Kaplan Meier survival analysis of all unicompartmental knees 2000-2005 with deceased patients censored at time of death. It demonstrates 98.3% revision free survival at one year 95.9% at two years, 94.5% at three years, 93.3% at four years, 91.7% at five years. There are insufficient numbers for accurate 6 year survival analysis.

Analysis by time of the 3 main reasons for revision

Pain n = 73

< 6 months	5
6 months – 1 year	14
> 1 – 2 years	29
> 2 – 3 years	13
>3 – 4 years	4
> 4 – 5 years	6
>5 – 6 years	2

Loosening tibial component n = 41

< 6 months	5
6 months – 1 year	7
> 1 – 2 years	20
> 2 – 3 years	4
>3 – 4 years	4
> 4 – 5 years	-
>5 – 6 years	1

Loosening femoral component n = 23

< 6 months	-
6 months – 1 year	6
> 1 – 2 years	10
> 2 – 3 years	2
>3 – 4 years	4
> 4 – 5 years	1
>5 – 6 years	-

Original unicompartmental prostheses revised

		%
Repicci II	5	1.8
Oxinium Uni	2	2.0
Preservation	11	3.4
Oxford Phase 3	94	4.7
Miller/Galante	22	4.8
Genesis Uni	13	6.4
LCS Uni	2	33.0

Over the last 2 years the revision percentage has declined for the Preservation and Repicci II but increased for Oxford Phase 3, and Genesis Uni; no LCS unis were implanted during 2004 – 2005.

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS POST SURGERY

At six-months post surgery patients are sent the Oxford-12 questionnaire. There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability.

This year we have grouped the questionnaire responses into six categories of Field et al (See appendix 2)

Category 1	12 – 17	(excellent)
Category 2	18 – 23	(very good)
Category 3	24 – 29	(good)
Category 4	30 – 35	(fair)
Category 5	36 – 41	(poor)
Category 6	> 41	(very poor)

For the six-year period and as at July 2006, there were 2228 unicompartmental knee questionnaire responses registered at six-months post surgery. (71% response)

The mean unicompartmental knee score was 21.49 (standard deviation 7.82, range 12 – 57)

Scoring	12 - 17	879
Scoring	18 - 23	623
Scoring	24 - 29	388
Scoring	30 - 35	192
Scoring	36 - 41	93
Scoring	> 41	53

At six-months post surgery, 67% had an excellent or very good score.

Analysis of the individual questions at 6 months

Analysis of the individual questions at six months showed that as with TKA the most common problems were: kneeling, (Q4), pain in the operated knee (Q1) and limping (Q10).

Overall the percentage of patients scoring 4 and 5 for each question is smaller when compared to TKA.

Percentage scoring 4 or 5 for each question (n = 2228)

1	Moderate or severe pain from the operated knee	12.8%
2	Only able to walk around the house or unable to walk before pain becomes severe	4.3%
3	Extreme difficulty or impossible to get in and out of a car or public transport	2.2%
4	Extreme difficulty or impossible to kneel down and get up afterwards	34.6%
5	Extreme difficulty or impossible to do the household shopping on your own	1.9%
6	Extreme difficulty or impossible to wash and dry yourself	0.4%
7	Pain interfering greatly or totally with your work	3.8%
8	Very painful or unbearable to stand up from a chair after a meal	4.0%
9	Most of the time or always feeling that the knee might suddenly “give way"	1.8%
10	Limping most or every day	10.4%
11	Extreme difficulty or impossible to climb a flight of stairs	4.1%
12	Pain from your knee in bed most or every nights	8.7%

Complication data from the questionnaires

Each questionnaire has a section to report hospitalisation for dislocation, infection, DVT, pulmonary embolism or any other reason.

Analysis of the 2228 questionnaires gave the following numbers of self-reported complications for the six-year period.

	Number	Registered revision
Infection	37	5
Dislocation	22	10
Manipulation	8	N/A
Haematoma	6	N/A
DVT	4	N/A
PE	3	N/A

Dislocation: of the 22 patient reported dislocations 12 were Oxford, 4 M.G., 4 Preservation and 2 Genesis 10 are recorded as having been revised.

Manipulation: 8 patients have reported MUA (0.4%) which is lower than the reported 1.0% for TKA’s.

P.E. : No further PE’s reported by patients during 2005 giving an incidence of 0.13% (in 6 year report

incidence erroneously reported as 0.12% but should have been 0.16%)

Infection: includes superficial and deep and the majority of the 37 reported would have had superficial as only 5 recorded as revised for deep infection.

Revision unicompartmental questionnaire responses

There were 17 responses from the 28 unicompartmental procedures that were revised to unicompartmental components. The questionnaire responses for these revision procedures had a mean of 24.4 (range 15 – 37)

ANKLE ARTHROPLASTY

PRIMARY ANKLE ARTHROPLASTY

The six- year report analyses data for the period January 2000 – December 2005. There were 216 primary ankle procedures registered, an additional 70 compared to last year's report.

2000	17
2001	28
2002	28
2003	26
2004	47
2005	70

There has been a 49% increase in the number of primary ankle registrations compared to 2004 when there were 47 registered.

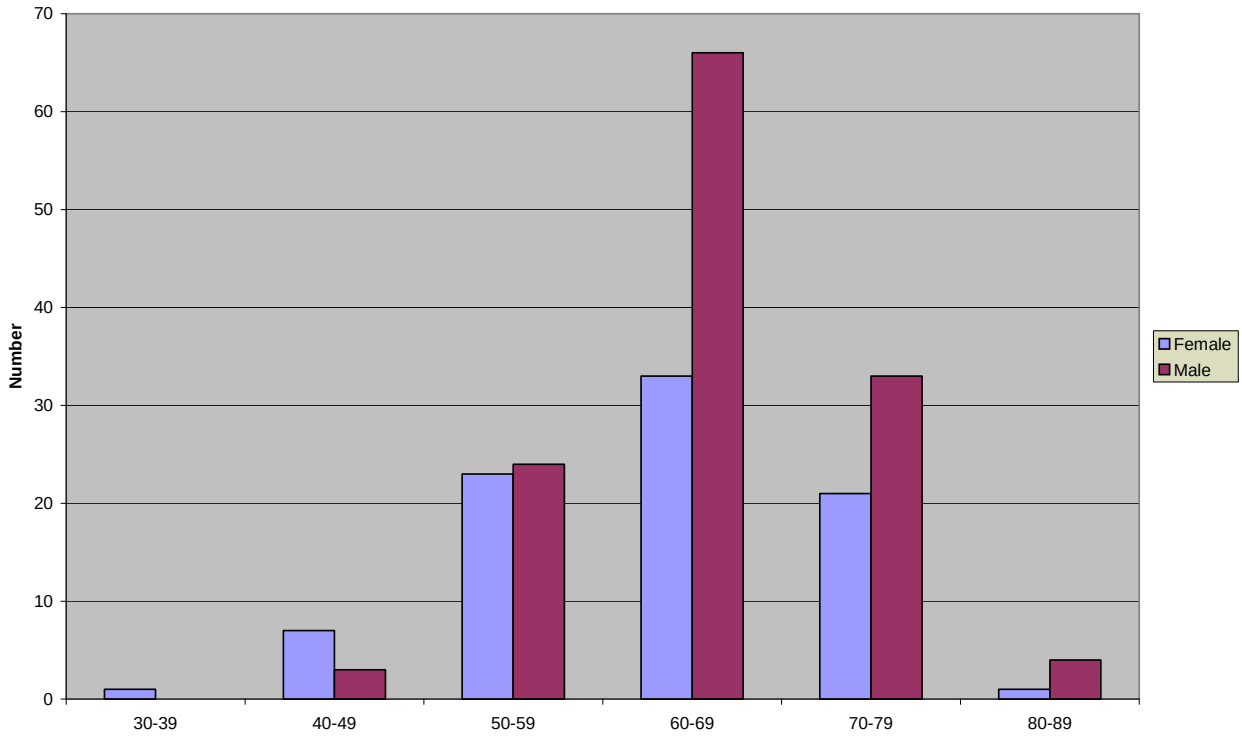
DATA ANALYSIS

Age and Sex Distribution

	Female	Male
Number	86	130
Percentage	39.81	60.19
Mean age	62.96	65.62
Maximum age	81.80	83.70
Minimum age	32.51	41.10
Standard dev.	9.50	7.98

The average age for a female with a primary ankle replacement is 62.96 and for a male is 65.62, similar to last year's report.

Age band distribution over 6 years



Previous operation

None	168
Internal fixation for juxtarticular fracture	24
Arthroscopy/debridement	8
Arthrodesis	7
Osteotomy	5
Reconstruction/repair ligaments	2
Other	1

Diagnosis

Osteoarthritis	149
Post trauma	42
Rheumatoid arthritis	26
Other inflammatory	1
Other	3

Approach

Anterior	174
Anterolateral	24
Other	6

Bone graft

Tibia autograft	19
Talus autograft	4

Cement

Tibia cemented	10
Antibiotic in cement	3
Talus cemented	6
Antibiotic in cement	3

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic 201 (96%)

Operating theatre

Conventional	160
Laminar flow	55
Space suits	22

ASA Class

This was introduced with the updated forms at the beginning of 2005. There are 35/70 (50%) primary ankle 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	No	%	Mean Age
1	7	20	57.57
2	22	63	62.91
3	5	14	68.00
4	1	3	67.00

63% of the procedures were ASA class 2

Operative time (skin to skin)

Mean	140 minutes
Standard deviation	39 minutes
Minimum	50 minutes
Maximum	255 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the following data is for 2005 only.

Consultant	70
Advanced Trainee	0

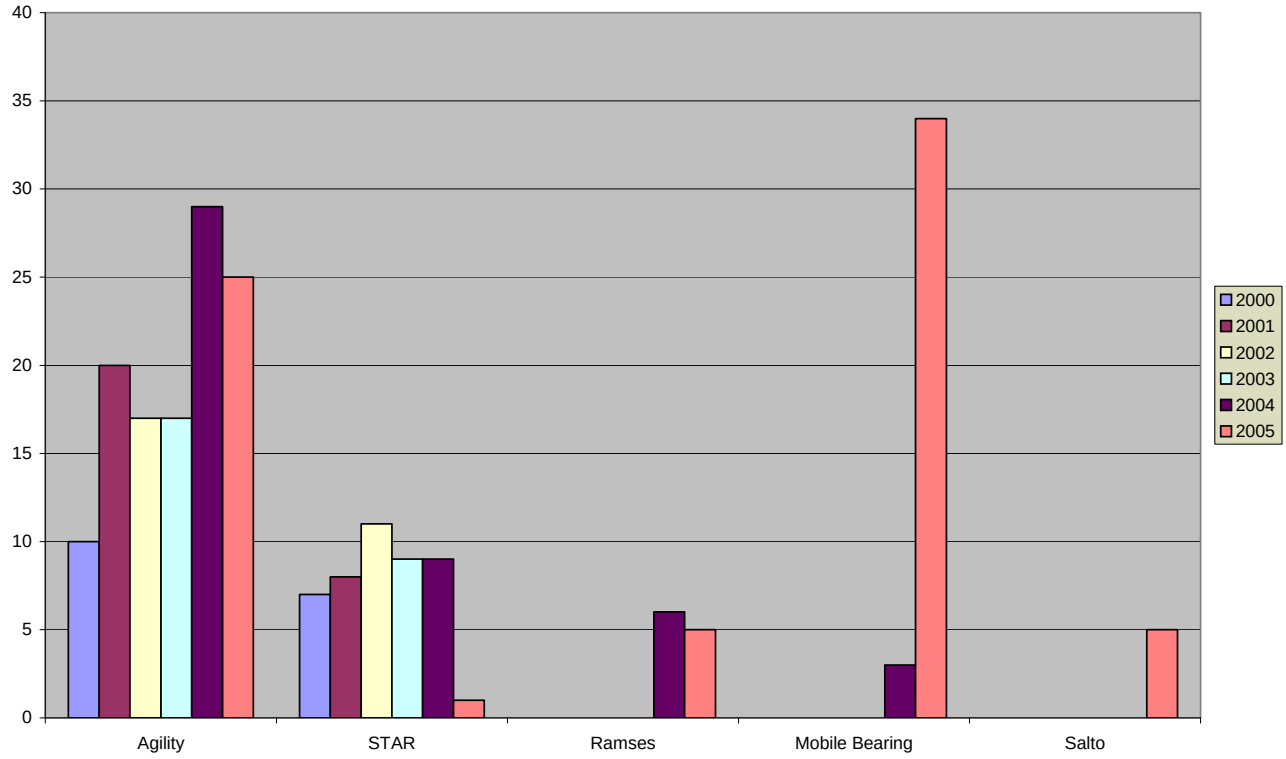
Prosthesis usage

Ankle prostheses used in 2005

Mobile Bearing	34
Agility	25
Ramses	5
Salto	5
STAR	1

The mobile bearing prosthesis (3rd generation) "took off" in 2005 and represented 50% of all prostheses. The Salto appears for the first time and the Star has all but disappeared

MOST USED ANKLE PROSTHESES 2000 – 2005



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Surgeon and hospital workload

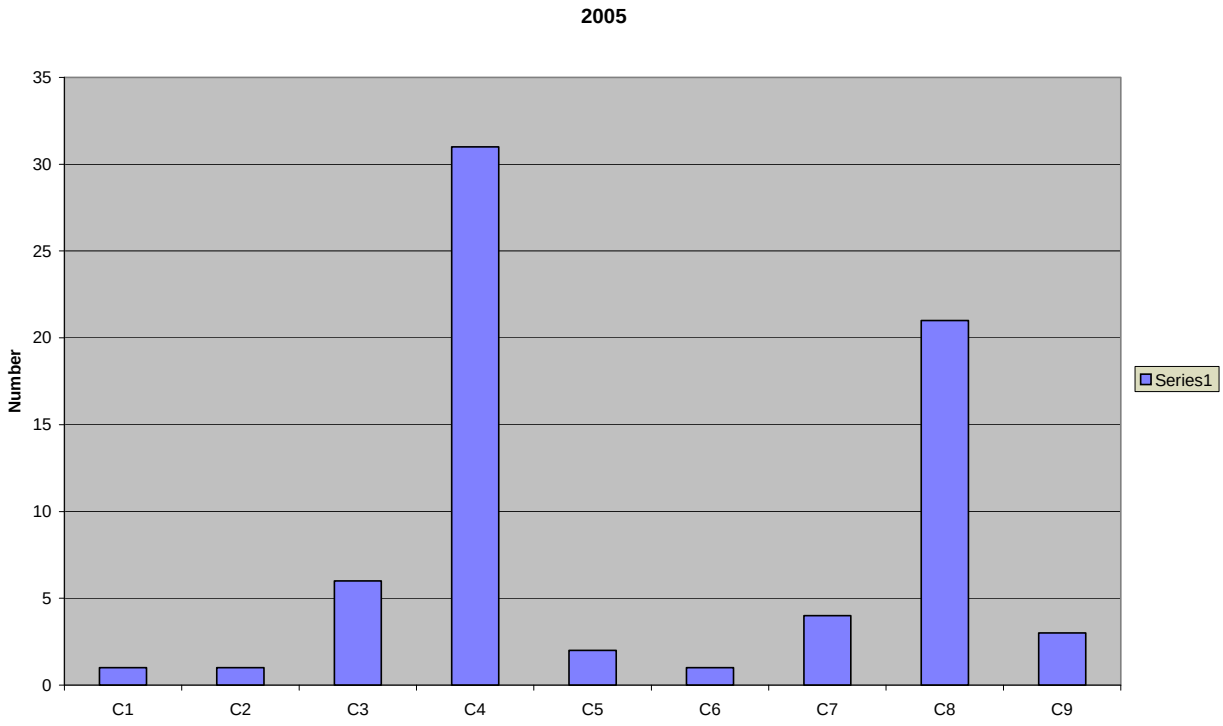
Surgeons

In 2005, 9 surgeons performed 70 primary ankle procedures, an average of 8 procedures per surgeon. 2 surgeons performed more than 20 procedures.

The number of surgeons performing TARs has significantly reduced indicating recognition that TAR is a very demanding procedure.

Hospitals

In 2005 primary ankle replacement was performed in 15 hospitals. 8 were public and 7 were private.
For 2005 the average number of primary ankle replacements per hospital was 5



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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. It includes arthrodesis or amputation, but not soft tissue procedures. A two or more staged procedure is registered as one revision.

Data analysis

For the six-year period January 2000– December 2005, there were 12 revision ankle procedures registered. This is an additional 4 compared to last year's report.
The average age for a female with a revision ankle replacement was 41.67 and a male was 58.33 years.

	Female	Male
Number	5	7
Percentage	41.67	58.33
Mean	59.52	68.40
Maximum age	78.98	73.06
Minimum age	42.15	60.25
Standard dev.	15.13	4.68

Reason for revision

Pain	5
Loosening talar component	4
Dislocation	2
Loosening tibial	1
Other	4

Revision approach

Anterior	8
Anterolateral	2

Bone graft

Tibial autograft	1
Talar autograft	1

Cement

Talus cemented	3
Antibiotic in cement	2
Tibia cemented	1
Antibiotic in cement	1

Systemic antibiotic prophylaxis

Patient procedures receiving at least one systemic antibiotic 9 (75%)

ASA Class

This was introduced at the beginning of 2005. There are now 3 out of 12 revision ankle procedures with the ASA class recorded.

ASA 1	1	Age	42
ASA 2	2	Mean age	72

Operating theatre

Conventional	7
Laminar flow	5

Operative time (skin to skin)

Mean	130 minutes
Minimum	75 minutes
Maximum	190 minutes
Standard deviation	39 minutes

Surgeon grade

Consultant	4

Revision of Registered Primary Ankle Arthroplasties

This section analyses data for revisions of primary ankle procedures for the six-year period.

There were 6 revisions of the primary group of 216 (2.78%).

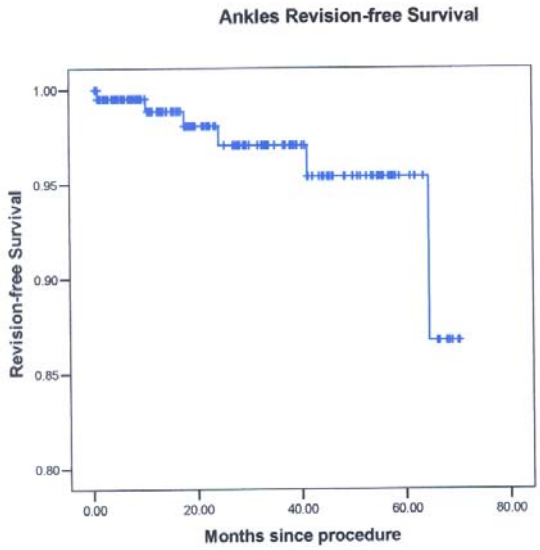
Time to revision

Mean	809 days
Maximum	1966 days
Minimum	32 days
Standard deviation	702 days

Reason for revision

Loosening talar component	4
Pain	2
Migration of tibial component	1

Survival Curve



Kaplan Meier survival analysis of all primary ankles 2000-2005 with deceased patients censored at time of death. It demonstrates 98.9% revision free survival at one year 98.1% at two years, 97.0% at three years, 95.4% at four years, 95.47% at five years. There are insufficient numbers for accurate 6 year survival analysis.

Analysis by time of the 3 main reasons for revision

Loosening talar component n = 4

< 6 months	1
>2 – 3 years	1
>3 – 4 years	1
>4 – 5 years	1

Pain n = 2

6 months – 1 year	1
>1 – 2 years	1

Migration of tibial component n = 1

>1 – 2 years	1

Original ankle prostheses revised

Agility	3 (2.5%)
STAR	3 (6.7%)

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS POST SURGERY

At six-months post surgery patients are sent a questionnaire. This is modelled on the Oxford-12, but is not validated.

There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability.

This year we have grouped the questionnaire responses into the six categories; of Field et al (See appendix 2).

Category 1	12 – 17	(excellent)
Category 2	18 – 23	(very good)
Category 3	24 – 29	(good)
Category 4	30 – 35	(fair)
Category 5	36 – 41	(poor)
Category 6	>41	(very poor)

For the six-year period and as at July 2006, there were 168 primary ankle questionnaire responses registered at six-months post surgery.

The mean primary ankle score was 27.16 (standard deviation 10.25, range 12 – 58)

Scoring	12 - 17	34
Scoring	18 - 23	38
Scoring	24 - 29	36
Scoring	30 - 35	21
Scoring	36 - 41	21
Scoring	> 41	18

At six- months post surgery, 43% had an excellent or good score.

Analysis of the individual questions at 6 months

Analysis of the individual questions showed that there were problems with pain (Q1), walking on uneven ground (Q3), having to use an orthotic (Q4), pain with work (Q5), limping (Q6), pain with recreational activities (Q9) and swelling of the foot (Q10).

Percentage scoring 4 or 5 for each question (n = 168)

1	Moderate or severe pain from the operated ankle	25.6%
2	Only able to walk around the house or unable to walk before the pain becomes severe	8.3%
3	Extreme difficulty or impossible to walk on uneven ground	17.3%

4	Most of the time or always have to use an orthotic	26.8%
5	Pain greatly or totally interferes with usual work	20.8%
6	Limping most or every day	31.5%
7	Extreme difficulty or impossible to climb a flight of stairs	7.7%
8	Pain from your ankle in bed most or every nights	7.1%
9	Pain from your ankle greatly or totally interferes with usual recreational activities	28.0%
10	Have swelling of your foot most or all of the time	33.9%
11	Very painful or unbearable to stand up from a chair after a meal	6.5%
12	Sudden severe pain from your ankle most or every day	7.1%

Complication data from the questionnaires

Each question has a section to report hospitalisation for dislocation, infection, DVT, Pulmonary embolism or any other reason.

Analysis of the 168 questionnaires gave the following numbers of self-reported dislocation and infection for the six-year period.

	Number	Registered revision
Infection	6	2 (1 A/K amputation)
Dislocation	4	1 (ankle fusion)

Revision ankle questionnaire responses

There were 6 revision ankle responses with only 2 achieving an excellent or very good score. This group includes all revision ankle responses. The mean revision ankle score was 31 (standard deviation 15.36, range 12 – 49). There was no complication data reported.

SHOULDER ARTHROPLASTY

PRIMARY SHOULDER ARTHROPLASTY

The six-year report analyses data for the period January 2000 – December 2005. There were 1275 primary shoulder procedures registered, an additional 293 compared to last year's report.

2000	122
2001	162
2002	193
2003	225
2004	280
2005	293

DATA ANALYSIS

Age and Sex Distribution

The average age for a female with a shoulder replacement is 71.84 and for a male is 67.04, similar to last year's report

	Female	Male
Number	855	420
Percentage	67.06	32.94
Mean age	71.84	67.04
Maximum age	97.71	90.48
Minimum age	15.63	27.81
Standard dev.	10.21	10.68

Of the 1275 shoulder registrations, 658 (52%) were identified as hemiarthroplasties. The remaining 617 (48%) were total shoulder arthroplasties.

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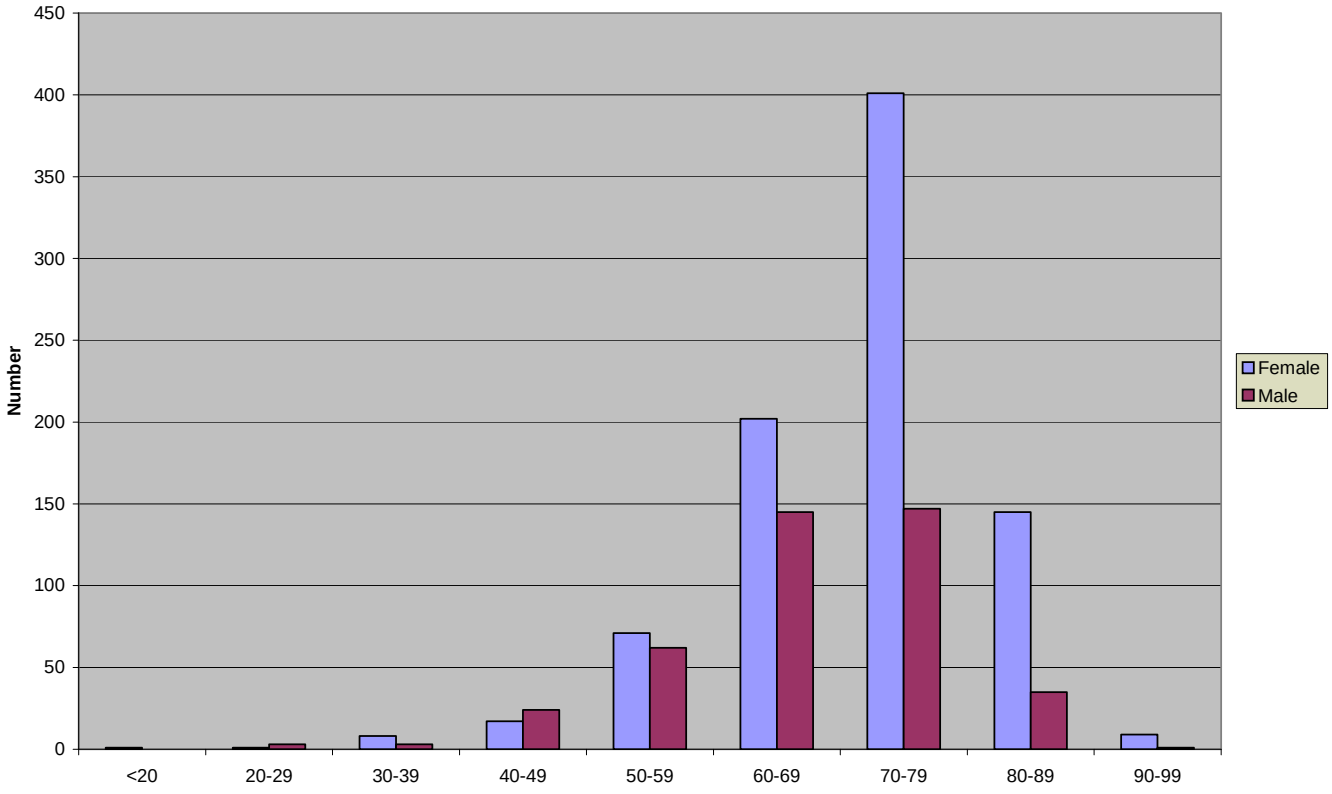
Age band distribution over 6 years



Previous operation

None	1068
Internal fixation for juxtarticular fracture	36
Rotator cuff repair	34
Previous stabilisation	25
Acromioplasty	19
Arthroscopy/debridement	15
Other	13

Diagnosis

Osteoarthritis	660
Rheumatoid arthritis	164
Acute fracture prox. humerus	159
Post old trauma	113
Cuff arthropathy	113
Avascular necrosis	54
Other inflammatory	21
Post recurrent dislocation	9
Tumour	8
Post dysplasia	1
Other	5

Approach

Deltopectoral	1157
Deltoid split	16
Anterior	15
Posterior	3
Mckenzie	2

Bone graft

Humeral autograft	38
Humeral allograft	5
Humeral synthetic	2
Glenoid autograft	7
Glenoid allograft	1

Cement

Humerus cemented	672
Antibiotic in cement	346
Glenoid cemented	413
Antibiotic in cement	222

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic 1183 (93%)

Operating theatre

Conventional	976
Laminar flow	279
Space suits	76

ASA Class

This was introduced with the updated forms at the beginning of 2005. There are 148/293 (51%) shoulder procedures with the ASA class recorded.

Definitions

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

ASA	No	%	Mean Age
1	15	10	67.2
2	79	53	70.67
3	53	36	71.91
4	1	0.6	81.00

53% of the procedures were ASA class 2 and the high percentage of ASA 3 reflects the higher proportion of RA patients.

Operative time (skin to skin) for hemiarthroplasty

Mean	106 minutes
Standard deviation	35 minutes
Minimum	30 minutes
Maximum	360 minutes

Operative time (skin to skin) for total shoulder arthroplasty

Mean	137 minutes
Standard deviation	34 minutes
Minimum	53 minutes
Maximum	270 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the following data is for 2005 only.

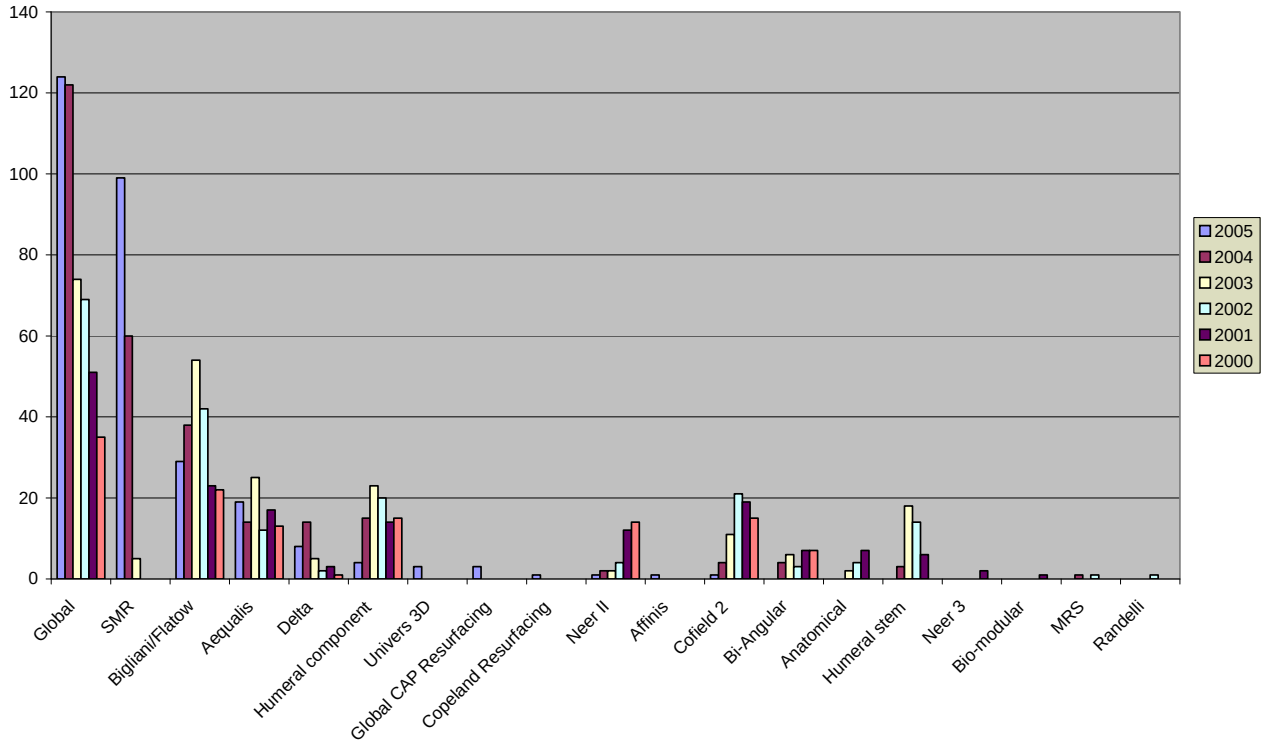
Consultant	279
Advanced trainee supervised	10
Basic trainee	1

Prosthesis usage

Shoulder prostheses used in 2005

Global	124
SMR	99
Bigliani/Flatow	29
Aequalis	19
Delta	8
Humeral component	4
Univers 3D	3
Global CAP Resurfacing	3
Copeland Resurfacing	1
Neer II	1
Affinis	1
Cofield 2	1

MOST USED SHOULDER PROSTHESES 2000 - 2005



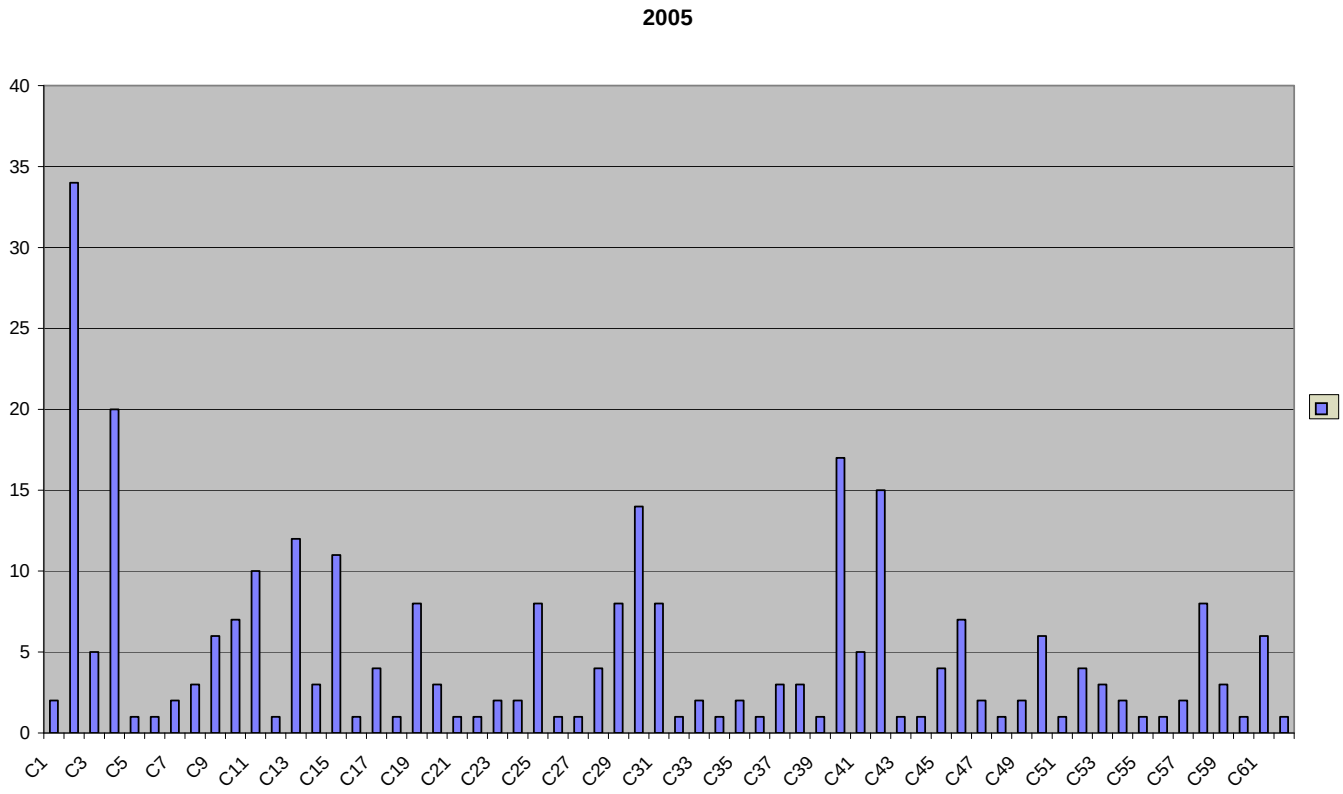
Surgeon and hospital workload

Surgeons

In 2005, 62 surgeons performed 293 shoulder procedures, an average of 5 procedures per surgeon. 1 surgeon performed more than 30 procedures. In the previous four years the number of surgeons was in the low 50's so the 62 registered for 2006 represents quite an increase.

Hospitals

In 2005, shoulder replacement was preformed in 44 hospitals. 25 were public and 19 were private. For 2005 the average number of shoulder replacements per hospital was 7.



REVISION SHOULDER ARTHROPLASTY

Revision is defined by the Registry as a new operation in a previously replaced shoulder joint during which one or more of the components are exchanged, removed, manipulated or added. It includes arthrodesis or amputation, but not soft tissue procedures. A two or more staged procedure is registered as one revision.

For the six-year period January 2000 – December 2005, there were 80 revision shoulder procedures registered. This is an additional 23 compared to last year's report.

Data analysis

Age and Sex Distribution

The average age for a female with a revision shoulder was 68.73 and a male was 66.49 years.

	Female	Male
Number	50	30
Percentage	62.5	37.5
Mean	68.73	66.49
Maximum age	87.22	80.36
Minimum age	33.89	40.94
Standard dev.	12.07	10.98

Reason for revision

Pain	24
Loosening glenoid	22
Dislocation/instability anterior	14
Wear glenoid	8
Subacromial cuff impingement	6
Deep infection	5
Instability posterior	4
Fracture humerus	4
Subacromial tuberosity	2
Loosening humeral	2
Other	10

Revision approach

Deltopectoral	73
Deltoid splitting	2

Bone graft

Humeral allograft	4
Humeral autograft	3
Humeral synthetic	1
Glenoid allograft	3
Glenoid autograft	1

Cement

Humerus cemented	35
Antibiotic in cement	26
Glenoid cemented	19
Antibiotic in cement	13

Systemic antibiotic prophylaxis

Patient procedures receiving at least one systemic antibiotic 67 (84%)

ASA Class

This was introduced at the beginning of 2005. There are now 12 out of 23 revision shoulder procedures with the ASA class recorded.

ASA 1	3	Mean age	54
ASA 2	9	Mean age	63

Operating theatre

Conventional	62
Laminar flow	18
Space suits	2

Operative time (skin to skin)

Mean	163 minutes
Standard deviation	72 minutes
Minimum	30 minutes
Maximum	387 minutes

Surgeon grade

Consultant	23

Revision of Registered Primary Arthroplasties

This section analyses data for revisions of primary shoulder procedures for the six-year period.

There were 26 revisions of the primary group of 1275 (2.04%).

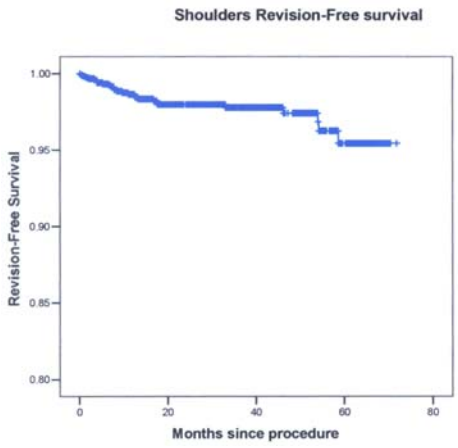
Time to revision

Mean	487 days
Maximum	1788 days
Minimum	7 days
Standard deviation	340 days

Reason for revision

Pain	12
Dislocation/instability anterior	6
Loosening glenoid	1
Instability posterior	1
Subacromial cuff impingement	1
Fracture humerus	1
Deep infection	1
Other	7

Survival Curve



Kaplan Meier survival analysis of all primary shoulders 2000-2005 with deceased patients censored at time of death. It demonstrates 98.7% revision free survival at one year 98.0% at two years, 97.8% at three years, 97.4% at four years, 95.5% at five years. There are insufficient numbers for accurate 6 year survival analysis.

Analysis by time for the 2 main reasons for revision

Pain n = 12

< 6 months	1
6 months – 1 year	5
>1 – 2 years	2
>2 – 3 years	1
> 3 – 4 years	-
>4 – 5 years	3

Dislocation n = 6

< 6 months	4
6 months – 1 year	1
>1 – 2 years	1

Original shoulder prostheses revised

	Numbers	%
Global	12	2.5
Bigliani/Flatow	5	2.4
SMR	4	2.5
Bi-angular	2	7.4
Aequalis	2	2
Osteonics humeral	1	1

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS POST SURGERY

At six-months post surgery patients are sent the Oxford-12 questionnaire. There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability. This year we have grouped the questionnaire responses into six categories of Field et al (See appendix 2).

Category 1	12 – 17	(excellent)
Category 2	18 – 23	(very good)
Category 3	24 – 29	(good)
Category 4	30 –35	(fair)
Category 5	36 – 41	(poor)
Category 6	>41	(very poor)

For the six-year period and as at July 2006, there were 896 shoulder questionnaire responses registered at six-months post surgery (70%).
The mean shoulder score was 24.72 (standard deviation 9.9, range 12 – 56)

Scoring	12 - 17	256
Scoring	18 - 23	228
Scoring	24 - 29	154
Scoring	30 - 35	117
Scoring	36 - 41	74
Scoring	> 41	67

At six-months post surgery, 54% had an excellent or very good score.

Analysis of the individual questions at 6 months

Analysis of the individual questions at six months showed that there were problems with pain (Q1 and Q2), brushing hair (Q7) and hanging clothes in a wardrobe (Q9).

Percentage scoring 4 or 5 for each question (n = 896)

1	The worst pain from the shoulder is severe or unbearable	18.0%
2	Usually have moderate or severe pain from the operated shoulder	23.1%
3	Extreme difficulty or impossible to get in and out of a car or public transport	3.5%
4	Extreme difficulty or	4.5%

	impossible to use a knife and fork at the same time	
5	Extreme difficulty or impossible to do the household shopping on your own	8.4%
6	Extreme difficulty or impossible to carry a tray containing a plate of food across a room	8.5%
7	Extreme difficulty or impossible to brush or comb hair with the operated arm	20.2%
8	Extreme difficulty or impossible to dress yourself because of your operated shoulder	8.1%
9	Extreme difficulty or impossible to hang clothes in a wardrobe using operated arm	18.1%
10	Extreme difficulty or impossible to wash and dry under both arms	9.9%
11	Pain from operated shoulder greatly or totally interfering with usual work	14.6%
12	Pain from shoulder in bed most or every nights	15.2%

Complication data from the questionnaires

Each questionnaire has a section to report hospitalisation for dislocation, infection, DVT, pulmonary embolism or any other reason. Analysis of the 896 questionnaires gave the following numbers of self-reported dislocation and infection for the six-year period.

	Number	Registered revision
Dislocation	9	5
Infection	5	1

Revision shoulder questionnaire responses

There were 53 revision shoulder responses with only 26% achieving an excellent or very good score. This group includes all revision shoulder responses. The mean revision shoulder score was 32.62 (standard deviation 11.67, range 13 – 57).

ELBOW ARTHROPLASTY

PRIMARY ELBOW ARTHROPLASTY

The six-year report analyses data for the period January 2000 – December 2005. There were 160 primary elbow procedures registered, an additional 30 compared to last year's report.

2000	18
2001	29
2002	32
2003	23
2004	28
2005	30

The number of TER has remained static compared to most other arthroplasties.

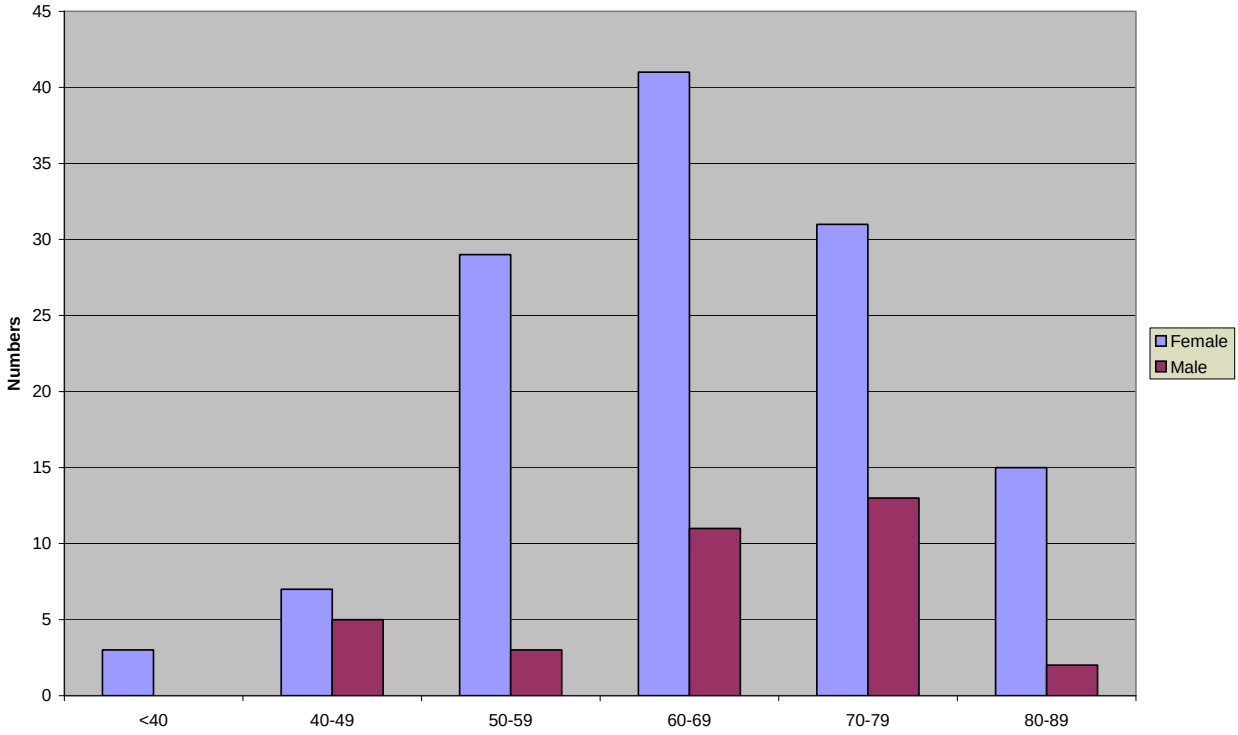
DATA ANALYSIS

Age & Sex Distribution

The average age for a female with a primary elbow replacement is 65.50 and for a male is 66.26 similar to last year's report.

	Female	Male
Number	126	34
Percentage	78.75	21.25
Mean age	65.50	66.26
Maximum age	86.68	83.84
Minimum age	36.38	41.62
Standard dev.	11.65	10.60

Age band distribution over 6 years



Previous operation

None	134
Internal fixation for juxtarticular fracture	6
Synovectomy	5
Ligament reconstruction	1
Interposition arthroplasty	1
Debridement	1
Osteotomy	1
Other	5

Diagnosis

Rheumatoid arthritis	100
Post fracture	36
Osteoarthritis	13
Other inflammatory	3
Post dislocation	3
Tumour	2
Post ligament disruption	1
Other	2

RA and fracture account for 85% of presurgery diagnoses

Approach

Posterior	97
Medial	33
Lateral	13

Bone graft

Humeral allograft	15
Humeral autograft	2
Ulnar autograft	2

Cement

Humerus cemented	140
Antibiotic in cement	70
Ulna cemented	143
Antibiotic in cement	67
Radius cemented	3
Antibiotic in cement	3

Systemic antibiotic prophylaxis

Patient number receiving at least one systemic antibiotic 150 (94%)

Operating theatre

Conventional	139
Laminar flow	21
Space suits	5

ASA Class

This was introduced with the updated forms at the beginning of 2005. There are 12/30 (40%) elbow 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	No	%	Mean Age
1	1	8	52.00
2	5	42	62.40
3	6	50	65.83

50% of the procedures were ASA class 3 patients which reflects the preponderance of RA patients.

Operative time (skin to skin)

Mean	131 minutes
Standard deviation	30 minutes
Minimum	56 minutes
Maximum	220 minutes

Surgeon grade

The updated forms introduced in 2005 have separated advanced trainee into supervised and unsupervised. Therefore the following data is for 2005 only.

Consultant	30
Trainee	0

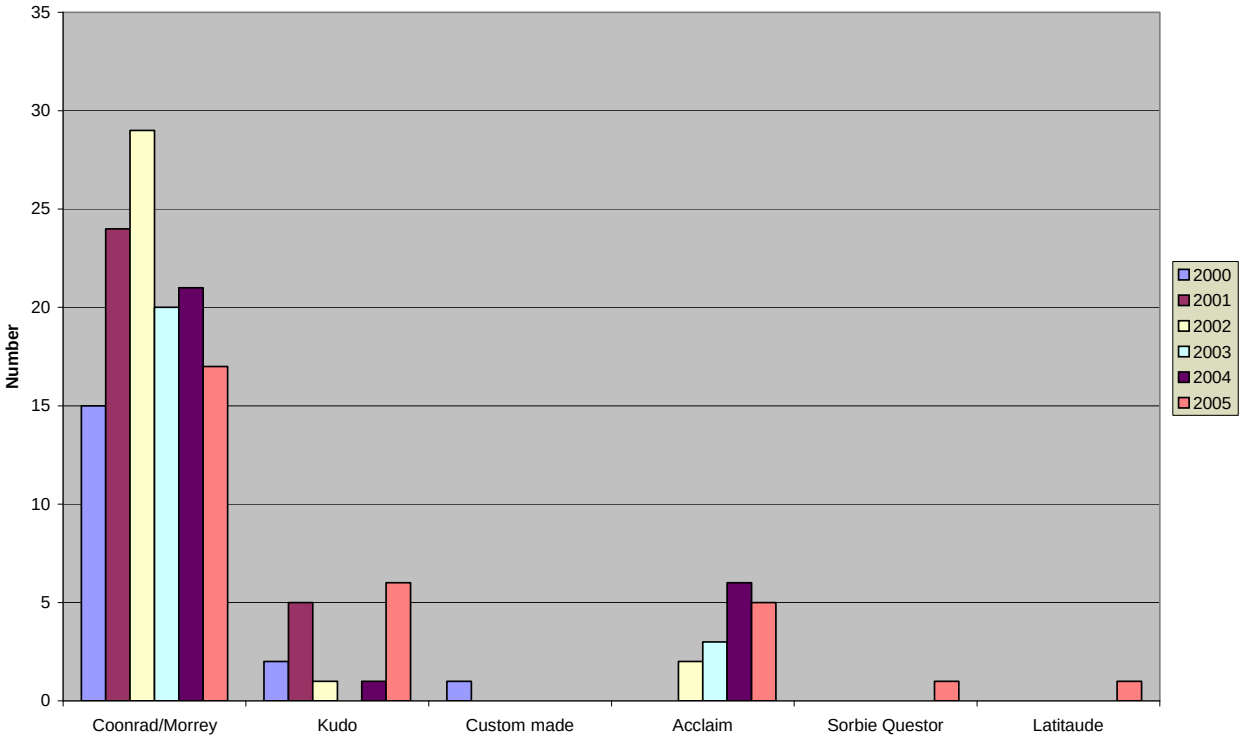
Prosthesis usage

Elbow prostheses used in 2005

Coonrad/Morrey	17
Kudo	6
Acclaim	5
Sorbie Questor	1
Latitude	1

The C.M. still the most popular but the Sorbie Questor and Latitude make their first appearance.

MOST PROSTHESES USED ELBOWS 5 YEARS 2000 – 2005



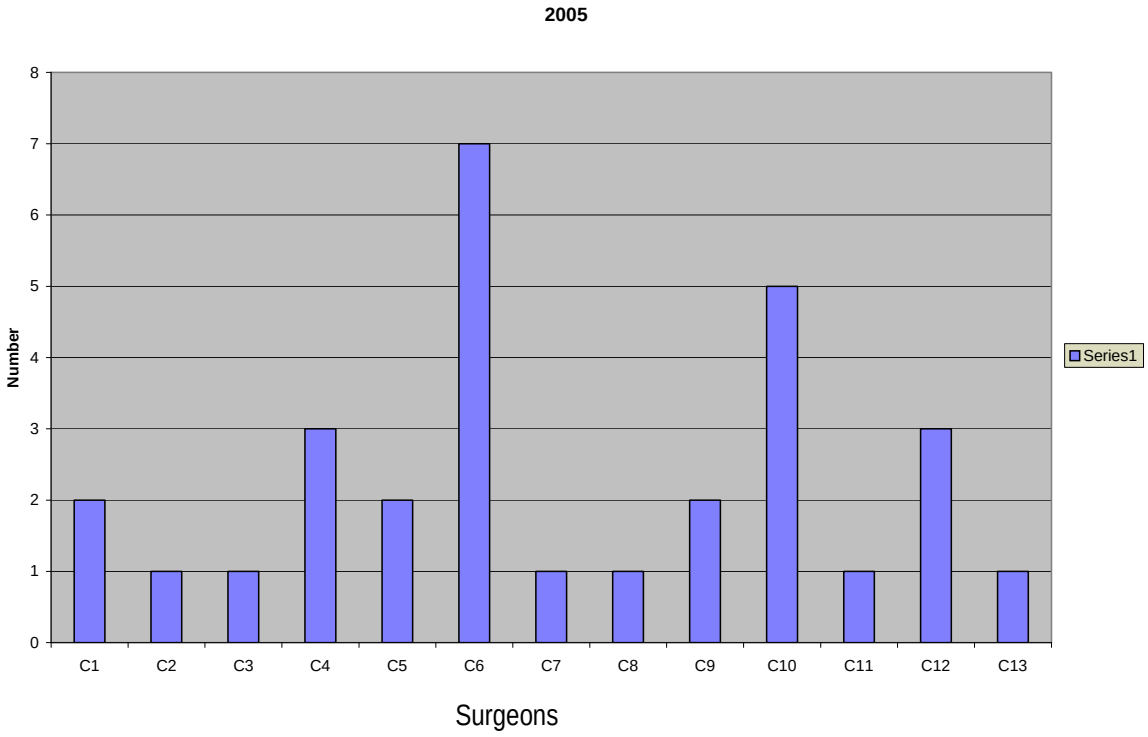
Surgeon and hospital workload

Surgeons

In 2005, 13 surgeons performed 30 primary elbow procedures, an average of 2 procedures per surgeon. 1 surgeon performed 7 primary elbow procedures.

Hospitals

In 2005, primary elbow replacement was performed in 11 hospitals. 5 were public and 6 were private. For 2005 the average number of primary elbow replacements per hospital was 3.



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. It includes arthrodesis or amputation, but not soft tissue procedures. A two or more staged procedure is registered as one revision.

Data analysis

For the six-year period January 2000 – December 2005, there were 26 revision elbow procedures registered. This is an additional 6 compared to last year's report.
The average age for a female with a revision elbow replacement was 64.39 and a male was 69.04

	Female	Male
Number	20	6
Percentage	76.92	23.08
Mean	64.39	69.04
Maximim age	88.95	80.37
Minimum age	48.16	50.73
Standard dev.	10.71	10.26

Reason for revision

Loosening ulnar component	11
Loosening humeral component	8
Deep infection	7
Fracture humerus	5
Pain	3
Loosening radial head	2
Fracture ulna	1
Other	2

Deep infection accounted for 27% of revisions which is by far the highest percentage among the different arthroplasties. It is a reflection of the compromised immune status and defence mechanisms in RA as well as the superficial position of the joint with infection able to enter via the olecranon bursa.

Approach

Posterior	16
Medial	7
Lateral	1

Bone graft

Humeral allograft	3
Humeral synthetic	1

Cement

Humerus cemented	21
Antibiotic in cement	1
Ulna cemented	17
Antibiotic in cement	10

Systemic antibiotic prophylaxis

Patient procedures receiving at least one systemic antibiotic 20 (77%)

ASA Class

This was introduced at the beginning of 2005. There are now 5/6 (83%) revision elbow procedures with the ASA class recorded.

ASA 2	2	Mean age	61.00
ASA 3	3	Mean age	78.67

Operating theatre

Conventional	20
Laminar flow	6

Operative time (skin to skin)

Mean	161 minutes
Minimum	75 minutes
Maximum	300 minutes
Standard deviation	54 minutes

Surgeon grade

Consultant	5
Basic trainee	1

Revision of Registered Primary Elbow Arthroplasties

This section analyses data for revisions of primary elbow procedures for the six-year period.

There were 6 revisions of the primary group of 160 (3.75%).

Time to revision

Mean	590 days
Maximum	868 days
Minimum	62 days
Standard deviation	345 days

Kaplan Meier survival analysis. There are insufficient numbers of elbow arthroplasties for an accurate Kaplan Meier survival analysis.

Reason for revision

Loosening ulnar component n = 2

>2 – 3 years	2

Deep infection n = 2

>1 – 2 years	1
>2 – 3 years	1

Fracture humerus n = 1

>6 months – 1 year	1

Dislocation n = 1

< 6 months	1

Original prostheses revised

Coonrad/ Morrey	3 (2.4%)
Kudo	2 (13.3%)
Acclaim	1 (6.3%)

PATIENT BASED QUESTIONNAIRE OUTCOMES AT SIX-MONTHS POST SURGERY

At six-months post surgery patients are sent a questionnaire. This is modelled on the Oxford-12, but is not validated.

There are 12 questions, scoring from 1 to 5. A score of 12 is the best, indicating normal function. A score of 60 is the worst, indicating the most severe disability.

This year we have grouped the questionnaire responses into the six categories of Field et al (See appendix 2)

Category 1	12 – 17 (excellent)
Category 2	18 – 23 (very good)
Category 3	24 – 29 (good)
Category 4	30 – 35 (fair)
Category 5	36 – 41 (poor)
Category 6	>41 (very poor)

For the six-year period and as at July 2006, there were 120 primary elbow responses registered at six-months post surgery (75%).

The mean primary elbow score was 22.26 (standard deviation 10.15, range 12 – 52)

Scoring 12 – 17	56
Scoring 18 – 23	23
Scoring 24 – 29	12
Scoring 30 – 35	13
Scoring 36 – 41	6
Scoring > 41	10

At six-months post surgery, 66% had an excellent or very good score.

Analysis of the individual questions at 6 months

Analysis of the individual questions showed at six months that there were problems with carrying the household shopping (Q5), pain with work or recreational activities (Q11), carrying a tray of food (Q6) and washing and drying under both arms (Q10).

Percentage scoring 4 or 5 for each question (n = 120)

1	The worst pain from the elbow is severe or unbearable	10%
2	Extreme difficulty or impossible to dress yourself because of your operated elbow	5.8%
3	Extreme difficulty or impossible to lift a teacup safely with your operated arm	5%
4	Extreme difficulty or impossible to get your hand to your mouth	5%
5	Extreme difficulty or impossible to carry the household shopping with your operated arm	17.5%
6	Extreme difficulty or impossible to carry a tray containing a plate of food across a room	13.3%
7	Extreme difficulty or impossible to brush or comb hair with the affected arm	11.7%
8	Usually have moderate or severe pain from the operated elbow	12.5%
9	Extreme difficulty or impossible to hang clothes in a wardrobe using operated arm	10%
10	Extreme difficulty or impossible to wash and dry under both arms	13.3%
11	Pain from operated elbow greatly or totally interfering with usual work or hobbies	15%
12	Pain from elbow in bed most or every nights	8.3%

It has to be acknowledged that it is difficult for Rheumatoid patients to separate out the function restrictions caused by the elbow from the effects of the disease affecting other upper limb joints.

Complication data from the questionnaires

Each questionnaire has a section to report hospitalisation for dislocation, infection, DVT, pulmonary embolism or any other reason.

Analysis of the 120 questionnaires gave 1 self reported infection that was not revised and 1 stress fracture of the humerus three weeks post surgery.

Revision elbow questionnaire responses

There were 16 revision elbow responses with 37.5% achieving an excellent or very good score. This group includes all revision elbow responses. The mean revision elbow score was 25.75 (standard deviation 8.7, range 12 – 38). There was no complication data reported.

APPENDIX I

REGISTRY RELATED CONFERENCE ABSTRACTS

RP9

PERIPROSTHETIC FRACTURES FOLLOWING TOTAL HIP ARTHROPLASTY IN NEW ZEALAND

YOUNG S, Pandit S, Munro J, Pitto R
Middlemore Hospital, Auckland

Management of periprosthetic fractures following total hip arthroplasty (THA) represents a difficult clinical problem, requiring expertise in both trauma and revision surgery. Estimates of the prevalence of postoperative fracture range from 0.1 % to 2.1 %, and with rising numbers of patients in the population living with hip prostheses in situ there is evidence that their frequency is increasing.

In this study, 233 patients (234 hips) undergoing revision THA for femoral fracture were identified from the New Zealand National Registry, and clinical outcomes were measured using Oxford Hip Scores (OHS) completed six months post operatively. A control group of 234 patients undergoing elective revision THA was selected and matched for age, sex, and time since index operation. In addition, 54 periprosthetic fractures in 50 patients treated at a single institution were reviewed to determine the relative frequency of fracture types, complication rates, and clinical outcomes.

Comparative analysis of the registry patients showed clinical outcomes were significantly worse following revision THA for fractured femur than in controls (mean OHS 28.6 vs 23.6, p=0.006), though this difference was not apparent in patients under the age of 65 years (mean OHS 26.1 vs 23.8, p =0.6). A higher mortality rate was found among fracture patients (17.1 % versus 10.7 %, p=0.05), and a statistically significant higher number of periprosthetic fracture patients died within 6 months of their surgery in comparison to controls (7.3% versus 0.9%, p=0.003). A higher rate of re-revision was observed in the fracture group (7.7% versus 2.6%, p=0.02).

The 54 fractures at a single institution were classified using the Vancouver system, the majority of which were type B1 (20) or type B2 (10). Fractures occurred an average of 7.3 years following primary arthroplasty and 4.3 years following revisions. The mean time to union for all fracture types was 4.6 months. The average Harris hip score was 73.1 and OHS 30.3 for all fracture types, at a mean follow up of 3.3 years. Of the 15 patients treated with revision surgery, the most common complication was dislocation (27%).

To our knowledge this study represents the largest series of periprosthetic fractures in THA with functional outcome data yet reported. Management of patients with periprosthetic fractures requires recognition of the challenging nature of these injuries, their associated poor prognosis, and high complication rate.

RP10

NERVE PALSY FOLLOWING TOTAL HIP AND KNEE ARTHROPLASTY IN NEW ZEALAND 1999-2003. DEBENHAM MJ & Van Dalen J.

Dept of Orthopaedics, Wanganui Hospital, Wanganui, New Zealand

Nerve palsy is a relatively rare but potentially disabling complication of arthroplasty. Numerous factors have been implicated in its origin. Our aim is to identify the demographics of nerve palsy following hip and knee arthroplasty in New Zealand.

A postal survey of all orthopaedic surgeons identifiable as practicing in New Zealand between January 1999 and December 2003 is underway. The number of surgeons performing hip & knee arthroplasty and how many they perform annually is being collected. Details of palsies sustained by their patients in the limb of surgery & elsewhere in the body along with the degree of recovery over 2 years are being collected. Surgical approach and anaesthetic type employed in the cases is being collected.

The New Zealand National Joint Registry data shows 42727 hip and knee replacements were performed during this time. 23387 primary and 3608 revision hip arthroplasties along with 15732 primary and 1408 revision knee arthroplasties. The rate of neurologic injury will be calculated along with degree & timing of recovery out to 2 years. Association with approach and anaesthetic type will be examined.

We aim to detail the recent New Zealand experience with nerve palsy following hip & knee arthroplasty.

References:

1. http://www.cdhb.govt.nz/NJR/figures.htm

RP11

DOES ANTIBIOTIC LOADED BONE CEMENT DECREASE THE RISK OF DEEP INFECTION IN CEMENTED PRIMARY HIP JOINT REPLACEMENT?

WICKHAM A.M. Hawkes Bay Health, Hastings.

Hawkes Bay Health, Hastings

Antibiotic bone cement is proven to reduce infection in revision arthroplasty; however its prophylactic use in primary hip arthroplasty is still debated. This study aims to investigate whether antibiotic loaded bone cement reduces the risk of deep infection, and therefore revision, for primary cemented total hip joint replacements.

Data was obtained for all primary cemented hip joint replacements recorded on the New Zealand Joint Registry between 1999 and 2005. Only the 4 most commonly cemented prosthesis were included (Exeter, Spectron, Muller, MS 30). Patients with incomplete data were excluded. Those patients that went on to have a revision, and the reason for the revisions, were identified. A Cox regression analysis was used to determine the effect antibiotic loaded bone cement had on revision rate. Hazard ratios are presented with controlling for gender, age, prosthesis, operating theatre, systemic antibiotic, use of space suits, the reason for the operation and the duration of the procedure.

23,137 primary cemented hip joint replacements were identified, 6,503 were excluded. Of the 16,634 remaining THJR 270 were revised, 52 for deep infection and 58 for aseptic loosening. Plain cement was used in 57% of cases and antibiotic loaded cement was used in 43%. The risk of revision for deep infection was significantly reduced for total hip joint replacements that used antibiotic loaded cement (0.43(95%Cl 0.21, 0.86) p=0.01 7). The risk of revision for aseptic loosening was less for those hips that received antibiotic loaded bone cement however this was not significant (0.73 (95% Cl 0.42, 1.28) p=0.097). No difference in revision rates were observed when all reasons for revision were compared (fracture, pain, loosening and deep infection). This study represents current data on a large group of patients. A significant proportion of prosthetic hips are implanted without antibiotic bone cement. Prophylactic use of antibiotic bone cement is effective. The New Zealand Joint registry is not currently recording unrevised deep prosthetic infections. We provide suggestions for future practices.

HP21

THE NEW ZEALAND JOINT REGISTRY: ANALYSIS OF THE OXFORD 12 HIP AND KNEE SCORES 6 MONTH AND 5 YEAR DATA

ROTHWELL A, Hobbs T Christchurch

Introduction:

The NZ Joint Registry was established in 1998, and became fully national in early 1999. Since its inception, patient feedback has been collected using the Oxford 12 questionnaire for the hip and the knee, to which were added questions relating to dislocation, infection, and any other complication that had not required revision. From 2000, similar questionnaires were generated for ankle, shoulder and elbow.

Methods:

Initially a questionnaire was sent to every patient 6 months following a primary or revised hip and knee joint replacement, but from July 2002, they were randomized to achieve a 1,000 annual responses each for primary hips and knees. Five year follow-up questionnaires have been collected since 2005. Oxford 12 scores range from 12 (best) to 60 (worst), and the grading system of Field, Cronin and Singh was adopted in 2006. Cumulative mean scores are generated for individual surgeons which can be compared to regional and national scores.

Results:

The mean hip score at 6 months for 15,414 primary hips was 19.3 (SD 7.50) with 81 % classified as excellent or very good and for 11,369 primary knees was 23.1 (SD 8.38) with 60% excellent or very good. For the 1694 hips with 6 months and 5 year scores, the mean had improved from 18.5 to 17.5 with 85% now excellent or very good and for 1,663 knees 22.8 to 21.3 with 69% excellent or very good. For 267 primary hips undergoing revision within 5 years, the mean 6 months score was 24.7, with 55% excellent or very good, and following revision was 23.7; for 185 knees, the mean score was 31 with 29% excellent or very good, and following revision was 30.

Conclusions:

The NZJR is the only national registry to collect patient feedback which provides important audit information. The benefits achieved within 6 months of surgery are maintained at 5 years, but it is noteworthy that those undergoing revision within that period have a higher 6 months mean score. This is being further analysed as an analysis of the 6 months score versus primary ankle revision demonstrated that with an Oxford score >29, there was a 35% chance of revision within 5 years, whereas with a score less than 29, a 5% change of revision.

KS12

SECONDARY PATELLAR RESURFACING. OUTCOME DATA FROM THE NEW ZEALAND NATIONAL JOINT REGISTRY TIETJENS B R

Eastwood Orthopaedic Clinic, Auckland

Patellar resurfacing in TKA remains controversial. Selective non-resurfacing of the patella is popular in NZ and Australia. Patients with an unresurfaced patella may undergo secondary resurfacing usually to relieve pain

The aim of this study was to see if outcome scores were improved in patients who undergo secondary patellar resurfacing following primary TKA

The 6 year report of the N Z National Joint Registry includes 18507 primary TKA registered between January 1999 and December 2004. In 12430(67%) the patella was not resurfaced initially. Of this group 83 have undergone secondary patellar resurfacing

The NZ Registry collects outcome data from randomly selected patients 6mths post surgery using

the Oxford-12 questionnaire. (A score of 12 is best and 60 the worst)
Of the 83 patients who underwent secondary patellar resurfacing, outcome data was available for 45 patients both 6mths post primary TKA and 6mths post secondary patellar resurfacing

The mean outcome score for primary TKA patients was 23.09 There was no significant difference between those with unresurfaced patellae(23.19) and resurfaced patellae(22.88)

In the group who underwent secondary patellar resurfacing the outcome score following primary TKA was only fair(mean32.84 range 14-50). Following secondary patellar resurfacing the mean outcome score was not improved(mean32.42 range l 5-48) In 24 patients(53%) the outcome score was unchanged or worse. In 19 patients(47%) the outcome score improved but in only 10 (22%) was the improvement greater than 6 points. 12 patients(26%) were rated excellent or good following secondary patellar resurfacing but in 9 of these 12 the outcome score was unchanged or worse following the second procedure

Secondary patellar resurfacing led to disappointing outcomes in the majority of patients. Persistent pain following TKA may be difficult to manage. Patients with an unresurfaced patella must be advised that secondary patellar resurfacing may not relieve their symptoms. Careful patient evaluation must be undertaken before considering secondary patellar resurfacing in TKA

KS11

PATELLAR RESURFACING IN TKA. THE NEW ZEALAND NATIONAL JOINT REGISTRY

TIETJENS B R

Eastwood Orthopaedic Clinic, Auckland

Patellar resurfacing in Total Knee Arthroplasty remains controversial. Selective non-resurfacing of the patella is popular in New Zealand and Australia. The aim of this study was to analyse relevant 6 year data from the NZ Joint Registry to look at regional variations in patellar resurfacing and differences related to prosthesis selection and surgeon experience

From January 1999 to December2004, 18507 primary TKA were registered. In 12430(67%)the patella was not resurfaced and in 6077(33%) the patella was resurfaced. Resurfacing rates were compared between 17regions in NZ. Resurfacing rates were compared for the 5 most commonly used prostheses. Rates were compared among the 10 Surgeons with the highest workload and for the 10 Surgeons with the lowest workload(excluding those performing less than 10 TKA per year)

There were large regional variations from West Coast(0% resurfacing)to Taranaki(85% resurfacing) Patellar resurfacing was preferred in the Auckland region(60%) which accounts for more than 30% of all primary TKA in NZ. In the next 4 regions(by TKA numbers) resurfacing was less common(meanl2% range 6%-29%)

There were variations for different prostheses from LCS(1 0% resurfacing) to Duracon(57% resurfacing)

Among the 10 Surgeons with the highest workload there was a small preference for non-resurfacing(43%) but there were large variations within the group from 0% to 100%. 3 Surgeons were committed to non - resurfacing$_t$3 Surgeons were committed to resurfacing and 4 Surgeons preferred selective non-resurfacing. The 10 Surgeons with the lowest workload showed a strong preference for non-resurfacing(8 of 10 Surgeons)

Large variations in patellar resurfacing rates in NZ confirm a lack of consensus. Patellofemoral complications in the past may have discouraged les experienced surgeons from resurfacing the patella.

More outcome data is needed to demonstrate the advantages and disadvantages of patellar resurfacing with contemporary prostheses

KS30

MEASURING KNEE ARTHROPLASTY OUTCOMES: EXPERIENCE USING THE OXFORD KNEE SCORE FOR CLINICAL USE AND SURGICAL AUDIT

ROWDEN N.J. Henry S.A.

Harrison J.A. Hurstville Knee

Clinic, Sydney, N.S.W.

Although there are many outcome instruments available to assess knee arthroplasty they are infrequently used for routine surgical audit.

This study aims to highlight the advantages and difficulties in using the Oxford Knee Score (OKS) for auditing arthroplasty outcomes and benchmarking results with other centres.

The Hurstville Knee Clinic (HKC) has used the OKS since 1998 and has prospective data on more than 1,000 patients undergoing unicompartmental (UKA) or total knee arthroplasty (TKA). Pre-operative data including patient demographics and the OKS modified scoring system (0-48) were collected and stored in a Microsoft Access database.

Post-operatively the OKS was assessed at 6 months, 1 year and thereafter every 2 years.
The OKS is a patient derived questionnaire which generates an overall score assessing knee pain and function and allows useful comparison with other groups of patients.

The OKS proved to be simple to use with a high rate of completion and patient acceptance. It provided a measure of outcome that is practical, reliable and sensitive to change.

Collective and individual scores when matched for age and sex provided an educational tool giving patients an insight into the potential and realistic benefits of knee surgery.

In addition scores can be compared with scores from other centres.

An analysis of our 6 month scores for UKA and TKA were compared with the New Zealand Orthopaedic

Association National Joint Register

(NZ NJR).

6 month Post Operative Oxford Knee Scores

UKA 39.5	(GRU) 426	HKC 38.3	(All) 1,825	NZ
TKA 37.8	(RBK) 108	HKC 36.9	(All) 10,283	NZ

Further breakdown of these scores into excellent (42-48), good (34-41), fair (24-33) and poor (0-23) allows an analysis of low scores (below 33). This analysis of scores can be used as a surgical audit to identify patients with a clinical failure or significant co-morbidities.

	Excellent	Good	Fair	Poor					
UKA	49.8	33.1	11.0	5.9	UKA (NZ)	43.9	33.4	16.3	6.4
TKA	42.5	34.0	15.0	7.5	TKA (NZ)	36.1	34.9	20.5	8.5

The use of the OKS provides the surgeon with a practical tool to measure and monitor outcomes in knee arthroplasty both within a practice and for comparison with other centres.

WHAT THE NATIONAL JOINT REGISTRY MEANS TO ME

The New Zealand National Joint Registry (NZNJR) has become an extremely valuable tool for Orthopaedic Surgeons performing joint replacement within New Zealand.

There are three main areas where the Joint Registry has been helpful in my practice.

1. Clinical Audit
   Every six months the NZNJR sends a six month audit to all participating Orthopaedic Surgeons. This allows the Orthopaedic Surgeon to compare the six month Oxford Scores with the rest of New Zealand and enables the surgeon to see whether his scores are comparable to his colleagues, and address any issues that may arise.
   This audit also allows comparison with other overseas registries.

2. Clinical Studies with Large Patient Numbers
   The NZNJR offers a data base of a large number of total joint replacements which has the potential to provide powerful and robust statistical analysis. This will be illustrated with a study on bilateral total joint replacement performed in New Zealand over a five year period.

3. Providing Survival Analysis Data
   The NZNJR also has the ability to provide surgeons with survival analysis data on patients they are studying. The NZNJR is 98% accurate ad as a result the survival data is also extremely accurate. This will be demonstrated with a study looking at the long term outcome of total knee replacement.

Gary Hooper
Christchurch
New Zealand

REVIEW OF TOTAL ANKLE ARTHROPLASTY IN NEW ZEALAND

Hosman A, Mason R, Rothwell A, Hobbs T

Abstract

The aim of this study was to document and evaluate the early results of a nationwide series of total ankle replacements performed with use of second and third-generation implants. The records of total ankle replacements, performed between February 2000 and November 2005, were retrieved from the New Zealand National Joint Registry and retrospectively reviewed at a mean of 28 months after the primary procedure. At 6 months post surgery, patient scores were generated from questionnaires. Comparisons between patient scores and categorical variables were made using ANOVA. Regression analyses using Cox proportional-hazards modeling were performed to determine predictors of failure. Kaplan-Meier survivorship curve was used to describe the rate of prosthetic survival. Two hundred and two total ankle replacements were performed in 183 patients. Fourteen prostheses failed (7% of total). Patient scores turned out to be a good predictor of subsequent failure. The cumulative five-year failure-free rate was 65% at sixty months, for patients with a patient score higher than 29 points and 95% for those who had a patient score lower or equal to 29 points. Each one-point increase of the patient score (i.e. poorer outcome) corresponded with a 5 relative increase in the risk of failure ($p<0.05$). In addition, longer operative time for the primary procedure was found in the group of total ankle replacements that subsequently failed ($p<0.05$). We noted a satisfactory early survival rate in New Zealand. Longer operative time and higher patient scores were found to have an adverse effect on prosthesis survival.

APPENDIX II

Reference

The Oxford Hip Scores for Primary and Revision Hip Replacement. Field RE, Cronin MD, Singh PJ, J Bone and Joint Surg 2004 87B - 5, 618-622

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

NATIONAL JOINT REGISTER
Primary Replacement Hip

Free Phone 0800-274-989 Total Hip Arthroplasty θ Resurfacing Arthroplasty θ 07.04.2005

Date: .....

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Consultant: ……
[If different from patient label]
Hospital: .....

Town/City

……

Tick Appropriate Boxes

PREVIOUS OPERATION ON INDEX JOINT

θ None
θ Internal fixation for juxtarticular fracture θ
θ Osteotomy
θ Arthrodesis
Other: .....
……

DIAGNOSIS

θ Osteoarthritis
θ Rheumatoid arthritis
θ Other inflammatory
θ Acute fracture NOF
θ Developmental dysplasia/dislocation
θ Old fracture NOF
θ Post acute dislocation
θ Avascular necrosis
θ Tumour
θ Other: Name: .....

APPROACH θ Image guided surgery θ Minimally invasive surgery
θ Anterior θ Posterior θ Lateral θ Trochanteric osteotomy

FEMUR

Please do not fold bar-coded label

ACETABULUM

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - FEMUR

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - ACETABULUM

θ Allograft
θ Autograft θ Synthetic

FEMORAL HEAD

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Femur θ Acetabulum θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS
Name: ..... ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant θ Adv Trainee Supervised Year…… θ Adv Trainee Unsupervised θ Basic Trainee

NB If bilateral procedure two completed forms are required

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

NATIONAL JOINT REGISTER
Primary Replacement Knee
Free Phone 0800-274-989 θ Total Knee Arthroplasty θ Unicompartmental θ Patellofemoral 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Hospital: .....

Town/City:……

Tick Appropriate Boxes

PREVIOUS OPERATION ON INDEX JOINT

θ None
θ Internal fixation for juxtarticular fracture
θ Ligament reconstruction
θ Menisectomy
θ Synovectomy
θ Osteotomy
θ Other: Name: .....
……

DIAGNOSIS

θ Osteoarthritis
θ Rheumatoid arthritis
θ Other inflammatory
θ Tumour
θ Post fracture
θ Post ligament disruption/reconstruction
θ Avascular necrosis
θ Other: Name: .....

APPROACH θ Image guided surgery θ Minimally invasive surgery
θ Medial parapatellar θ Lateral parapatellar θ Other

FEMUR

Please do not fold bar-coded label

TIBIA

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - FEMUR

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - TIBIA

θ Allograft
θ Autograft θ Synthetic

PATELLA

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Femur θ Tibia θ Patella θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name …….. ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant
θ Adv Trainee Unsupervised
θ Adv Trainee Supervised Year……
θ Basic Trainee

***NB** *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Primary Replacement Shoulder
Free Phone 0800-274-989 θ Total shoulder arthroplasty θ Hemiarthroplasty 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Patient Name:
Address:

d.o.b. **NHI:**
Attach Patient Label

Side:..... **

Hospital: .....

Town/ City ……

Tick Appropriate Boxes

PREVIOUS OPERATION ON INDEX JOINT

θ None
θ Internal fixation for juxtarticular fracture
θ Previous stabilisation
θ Osteotomy
θ Arthrodesis
θ Other: Name: .....

DIAGNOSIS

θ Rheumatoid arthritis
θ Osteoarthritis
θ Other inflammatory
θ Acute fracture proximal humerus
θ Post recurrent dislocation
θ Avascular necrosis
θ Post dysplasia
θ Post old trauma
θ Other: Name: .....

APPROACH

θ Deltopectoral θ Other : specify

HUMERUS

Please do not fold bar-coded label

GLENOID

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - HUMERUS

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - GLENOID

θ Allograft
θ Autograft θ Synthetic

HUMERAL HEAD

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK ALL LABELS ON REVERSE SIDE

CEMENT

θ Humerus θ Glenoid θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name: …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

***NB* *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Primary Replacement Ankle

Free Phone 0800-274-989 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Hospital: .....

Town/City ……

Tick Appropriate Boxes

PREVIOUS OPERATION ON INDEX JOINT

θ None
θ Internal fixation for juxtarticular fracture
θ Arthrodesis
θ Other: Name: ……
θ Osteotomy

DIAGNOSIS

θ Osteoarthritis
θ Rheumatoid arthritis
θ Other inflammatory
θ Post trauma
θ Avascular necrosis talus
θ Other: Name: .....

APPROACH

θ Anterior θ Anterio-lateral θ Other

TIBIA

Please do not fold bar-coded label

TALUS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - TIBIA

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - TALUS

θ Allograft
θ Autograft θ Synthetic

AUGMENTS

Please do not fold bar-coded label

FUSION DISTAL TFJ

STICK ALL LABELS ON REVERSE SIDE

CEMENT

θ Tibia θ Talus θ Antibiotic Brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name: …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant θ Adv Trainee Unsupervised θ Adv Trainee Supervised Year……. θ Basic Trainee

***NB* *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Primary Replacement Elbow

Free Phone 0800-274-989 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Hospital: .....

Town/City: ……

Tick Appropriate Boxes

PREVIOUS OPERATION ON INDEX JOINT

θ None
θ Internal fixation for juxtarticular fracture
θ Ligament reconstruction
θ Interposition arthroplasty
θ Debridement
θ Synovectomy ± removal radial head
θ Osteotomy
θ Other: Name: .....

DIAGNOSIS

θ Rheumatoid arthritis
θ Osteoarthritis
θ Other inflammatory
θ Post dislocation
θ Post fracture
θ Post ligament disruption
θ Other: Name: .....

APPROACH

θ Medial θ Lateral θ Posterior

HUMERUS

Please do not fold bar-coded label

ULNA

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - HUMERUS

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - ULNA

θ Allograft
θ Autograft θ Synthetic

RADIAL HEAD

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Humerus θ Ulna θ Radius θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant
θ Adv Trainee Unsupervised
θ Adv Trainee Supervised Year……
θ Basic Trainee

***NB* *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Revision Hip Joint

Free Phone 0800-274-989 07.04.2005

Date: .....

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Consultant: ……
[If different from patient label]

Hospital: .....

Town/City: ……

Tick Appropriate Boxes

REASON FOR REVISION

- θ Loosening acetabular component
- θ Loosening femoral component
- θ Dislocation
- θ Pain
- θ Previous hemiarthroplasty
- θ Deep infection
- θ Fracture femur
- θ Removal of components
- θ Other: Name: ……

Date Index Operation: ……

If re-revision - Date previous revision: ……..

REVISION

- θ Change of femoral component
- θ Change of acetabular component
- θ Change of head
- θ Change of liner
- θ Change of all components

APPROACH θ Image guided surgery θ Minimally invasive surgery
θ Anterior θ Posterior θ Lateral θ Trochanteric osteotomy

FEMUR

Please do not fold bar-coded label

ACETABULUM

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - FEMUR

θ Allograft θ Synthetic
θ Autograft

BONE GRAFT - ACETABULUM

θ Allograft θ Synthetic
θ Autograft

FEMORAL HEAD

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Femur θ Acetabulum θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name ……. ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

***NB* *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Revision Knee Joint

Free Phone 0800-274-989 07.04.2005

Date: .....

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Consultant: ……
[If different from patient label]

Hospital: .....

Town/City: ……

Tick Appropriate Boxes

REASON FOR REVISION

- θ Loosening femoral component
- θ Loosening tibial component
- θ Loosening patellar component
- θ Pain
- θ Previous unicompartmental
- θ Deep infection
- θ Fracture femur
- θ Fracture tibia
- θ Other details: ……..

Date Index Operation: ……

If re-revision - Date previous revision: ……..

REVISION

- θ Change of femoral component
- θ Change of tibial component
- θ Change of patellar component
- θ Addition of patellar component
- θ Change of tibial polyethylene only
- θ Change of all components
- θ Removal of components
- θ Other

APPROACH θ Image guided surgery θ Minimally invasive surgery θ Medial parapatellar θ Lateral parapatellar θ Other

FEMUR

Please do not fold bar-coded label

TIBIA

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT – FEMUR

θ Allograft θ Autograft θ Synthetic

BONE GRAFT – TIBIA

θ Allograft θ Autograft θ Synthetic

PATELLA

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Femur θ Tibia θ Patella θ Antibiotic brand: .....……

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant θ Adv Trainee Unsupervised θ Adv Trainee Supervised Year…….. θ Basic Trainee

***NB** *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Revision Shoulder

Free Phone 0800-274-989 07.04.2005

Date: .....

Side:..... **

Tick Appropriate Boxes

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Consultant: ……
[If different from patient label]
Hospital: .....
Town/City: ……

REASON FOR REVISION

- θ Loosening glenoid component
- θ Loosening humeral component
- θ Loosening both compartments
- θ Dislocation/instability anterior
- θ Instability posterior
- θ Subacromial tuberosity impingement
- θ Subachromial cuff impingement/tear
- θ Fracture humerus
- θ Deep infection
- θ Pain
- θ Other: Name: ……

Date Index Operation: ……

If re-revision - Date previous revision: ……

REVISION

- θ Change of head only
- θ Change of humeral component
- θ Change of glenoid component
- θ Change of liner (glenoid non cemented)
- θ Change of all components
- θ Remove glenoid
- θ Remove humerus
- θ Removal of components
- θ Other Specify: ……

APPROACH

θ Deltopectoral θ Other: specify

HUMERUS

Please do not fold bar-coded labels

GLENOID

Please do not fold bar-coded labels

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - HUMERUS

θ Allograft θ Synthetic
θ Autograft

BONE GRAFT - GLENOID

θ Allograft θ Synthetic
θ Autograft

HUMERAL HEAD

Please do not fold bar-coded labels

AUGMENTS

Please do not fold bar-coded labels

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Humerus θ Glenoid θ Antibiotic brand: .....

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name ..... ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Adv Trainee Unsupervised
θ Consultant θ Adv Trainee Supervised Year…… θ Basic Trainee

***NB** *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Revision Ankle Joint

Free Phone 0800-274-989 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Side:..... **

Patient Name:
Address:

d.o.b. **NHI:**

Attach Patient Label

Hospital: .....

Town/City: ……..

Tick Appropriate Boxes

REASON FOR REVISION

- θ Loosening talar component
- θ Loosening tibial component
- θ Dislocation
- θ Pain
- θ Deep infection
- θ Fracture talus
- θ Fracture tibia
- θ Dislocations
- θ Other details: ……

Date Index Operation: …….. If re-revision - Date previous revision: ……..

REVISION

- θ Change of talar component
- θ Change of tibial component
- θ Change of polyethylene only
- θ Change of all components
- θ Removal of components
- θ Other Name: ……..

APPROACH

θ Anterior θ Anterio-lateral θ Posterior

TIBIA

Please do not fold bar-coded label

TALUS

Please do not fold bar-coded label

STICK ALL LABELS ON REVERSE SIDE

BONE GRAFT - TIBIA

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - TALUS

θ Allograft
θ Autograft θ Synthetic

AUGUMENTS

Please do not fold bar-coded label

FUSION DISTAL TFJ

Yes θ No θ

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Talus θ Tibia θ Antibiotic brand: ……

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Consultant θ Adv Trainee Unsupervised
θ Adv Trainee Supervised Year…… θ Basic Trainee

***NB** *If bilateral procedure two completed forms are required*

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

NATIONAL JOINT REGISTER
Revision Elbow Joint

Free Phone 0800-274-989 07.04.2005

Date: .....

Consultant: ……
[If different from patient label]

Side:..... **

Patient Name:
Addr ess:

d.o.b. **NHI:**

Attach Patient Label

Hospital: .....

Town/City: ……

Tick Appropriate Boxes

REASON FOR REVISION

- θ Loosening humeral component
- θ Loosening ulnar component
- θ Loosening radial head component
- θ Pain
- θ Deep infection
- θ Fracture humerus
- θ Fracture ulna
- θ Dislocations
- θ Other Name: ……

Date Index Operation: …… If re-revision - Date previous revision: ……

REVISION

- θ Change of humeral component
- θ Change of ulnar component
- θ Change of radial head component
- θ Change of all components
- θ Removal of components
- θ Other Name: ……

APPROACH

θ Medial θ Lateral θ Posterior

HUMERUS

Please do not fold bar-coded label

ULNA

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

BONE GRAFT - HUMERUS

θ Allograft
θ Autograft θ Synthetic

BONE GRAFT - ULNA

θ Allograft
θ Autograft θ Synthetic

RADIAL HEAD

Please do not fold bar-coded label

AUGMENTS

Please do not fold bar-coded label

STICK EXTRA LABELS ON REVERSE SIDE

CEMENT

θ Humerus θ Ulna θ Radius θ Antibiotic brand: ……

θ SYSTEMIC ANTIBIOTIC PROPHYLAXIS

Name …… ASA Class: 1 2 3 4 (please circle one)

OPERATING THEATRE

θ Conventional θ Laminar flow or similar θ Space suits

SKIN TO SKIN TIME *mins* Start skin ..... Finish skin .....

PRIMARY OPERATING SURGEON

θ Adv Trainee Unsupervised

θ Consultant θ Adv Trainee Supervised Year…… θ Basic Trainee

***NB** *If bilateral procedure two completed forms are required*

TOTAL HIP REPLACEMENT - QUESTIONNAIRE

Patient Name: …… Date of Birth: ……..

Patient Address: …… Operating Surgeon: ……..

…… Date of Surgery: ……..

We would like you to score yourself on the following 12 questions. Each question is scored from 1 to 5, from least to most difficulty or severity: 1 being the least difficult/severe and 5 being the most difficult/severe. Please circle the number which best describes yourself OVER THE LAST 4 WEEKS

Please circle the SIDE on which you had your surgery performed Left Right

1. How would you describe the pain you usually have from your operated on hip?
   1 None
   2 Very mild
   3 Mild
   4 Moderate
   5 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)
   1. No pain up to 30 minutes
   2 16 to 30 minutes
   3 5 to 15 minutes
   4 Around the house only
   5 Unable to walk because of 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?
   1 No trouble at all
   2 Very little trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

4. Have you been able to put on a pair of socks, stockings or tights?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

5. Could you do the household shopping on your own?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on hip?
   1 No trouble at all
   2 Very little trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

7 How much has pain from your operated on hip interfered with your usual work (including housework)?
   1 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 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?
   1 Not at all painful
   2 Slightly painful
   3 Moderately painful
   4 Very painful
   5 Unbearable

9. Have you had any sudden, severe pain - 'shooting', 'stabbing' or 'spasms' - from the affected operated on hip?
   1 Rarely/never
   2 Sometimes or just at first
   3 Often, not just at first
   4 Most of the time
   5 All of the time

10. Have you been limping when walking, because of your operated on hip?
   1 No days
   2 Only 1 or 2 days
   3 Some days
   4 Most days
   5 Every day

11. Have you been able to climb a flight of stairs?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

12 Have you been troubled by pain from your operated on hip in bed at night?
   1 No nights
   2 Only 1 or 2 nights
   3 Some nights
   4 Most nights
   5 Every night

Additional Information

Have you at any time been hospitalised because:

	Yes	No	Approx Date
The artificial joint dislocated?	°	°	……..
The joint became infected?	°	°	……..

or for any other reason related

to the artificial joint ……..

Hospital admitted to: ……..

π I wish to receive a progress report on the study. . 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.

TOTAL KNEE REPLACEMENT - QUESTIONNAIRE

Patient Name: …… Date of Birth: ……..

Patient Address: …… Operating Surgeon: ……..

…… …… Date of Surgery: ……..

We would like you to score yourself on the following 12 questions. Each question is scored from 1 to 5, from least to most difficulty or severity: 1 being the least difficult/severe and 5 being the most difficult/severe. Please circle the number which best describes yourself OVER THE LAST 4 WEEKS

Please circle the SIDE on which you had your surgery performed Left Right

1. How would you describe the pain you usually have from your operated on knee?
   1 None
   2 Very mild
   3 Mild
   4 Moderate
   5 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)
   1. No pain up to 30 minutes
   2 16 to 30 minutes
   3 5 to 15 minutes
   4 Around the house only
   5 Unable to walk because of 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?
   1 No trouble at all
   2 Very little trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

4. Could you kneel down and get up again afterwards on your operated knee?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

5. Could you do the household shopping on your own?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

6. Have you had any trouble with washing and drying yourself (all over) because of your operated on knee?
   1 No trouble at all
   2 Very little trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

7 How much has pain from your operated on knee interfered with your usual work (including housework)?
   1 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 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?
   1 Not at all painful
   2 Slightly painful
   3 Moderately painful
   4 Very painful
   5 Unbearable

9 Have you felt that your operated on knee might suddenly "give way" or let you down?
   1 Rarely/never
   2 Sometimes or just at first
   3 Often, not just at first
   4 Most of the time
   5 All of the time

10 Have you been limping when walking, because of your operated on knee?
   1 No days
   2 Only 1 or 2 days
   3 Some days
   4 Most days
   5 Every day

11 Could you walk down a flight of stairs?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

12 Have you been troubled by pain from your operated on knee in bed at night?
   1 No nights
   2 Only 1 or 2 nights
   3 Some nights
   4 Most nights
   5 Every night

Additional Information

Have you at any time been hospitalised because:

	Yes	No	Approx Date
The artificial joint dislocated?	°	°	……..
The joint became infected?	°	°	……..

or for any other reason related to the artificial joint ……..

Hospital admitted to: ……..

π I wish to receive a progress report on the study. 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.

TOTAL SHOULDER REPLACEMENT - QUESTIONNAIRE

Patient Name: …… Date of Birth: ……..

Patient Address: …… Operating Surgeon: ……..

…… Date of Surgery: ……..

We would like you to score yourself on the following 12 questions. Each question is scored from 1 to 5, from least to most difficulty or severity: 1 being the least difficult/severe and 5 being the most difficult/severe. Please circle the number which best describes yourself OVER THE LAST 4 WEEKS Which is your dominant arm? Left Right

Please circle the SIDE on which you had your surgery performed Left Right

1. How would you describe the *worst* pain you have had from your operated on shoulder?
   1 None
   2 Mild
   3 Moderate
   4 Severe
   5 Unbearable

2. How would you describe the pain you *usually* have from your operated on shoulder?
   1 None
   2 Very mild
   3 Mild
   4 Moderate
   5 Severe

3. Have you had any trouble getting in and out of a car or using public transport because of your operated on shoulder?
   1. No trouble at all
   2 A little bit of trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

4. Have you been able to use a knife and fork at the same time?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

5. Could you do the household shopping on your own?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

6. Could you carry a tray containing a plate of food across a room?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

7 Could you brush/comb your hair with the operated on arm?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, Impossible

8. Have you had any trouble dressing yourself because of your operated on shoulder?
   1. No trouble at all
   2 A little bit of trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

9. Could you hang your clothes up in a wardrobe – using the operated on arm?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

10 Have you been able to wash and dry yourself under both arms?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

11 How much has pain from your operated on shoulder interfered with your usual work hobbies or recreational activities (including housework)?.
   1 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 Totally

12 Have you been troubled by pain from your operated on shoulder in bed at night?
   1 No nights
   2 Only 1 or 2 nights
   3 Some nights
   4 Most nights
   5 Every night

Additional Information

Have you at any time been hospitalised because:

	Yes	No	Approx Date
The artificial joint dislocated?	°	°	……..
The joint became infected?	°	°	……..

or for any other reason related to the artificial joint ……..

Hospital admitted to: ……..

π I wish to receive a progress report on the study. . 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.

TOTAL ANKLE REPLACEMENT - QUESTIONNAIRE

Patient Name: …… Date of Birth: ……..

Patient Address: …… Operating Surgeon: ……..

…… Date of Surgery: ……

We would like you to score yourself on the following 12 questions. Each question is scored from 1 to 5, from least to most difficulty or severity: 1 being the least difficult/severe and 5 being the most difficult/severe. Please circle the number which best describes yourself OVER THE LAST 4 WEEKS

Please circle the SIDE on which you had your surgery performed Left Right

1. How would you describe the pain you usually have from your operated on ankle?
   1 None
   2 Very mild
   3 Mild
   4 Moderate
   5 Severe

2. For how long have you been able to walk before the pain from your operated on ankle becomes severe?
   1. No pain up to 30 minutes
   2 16 to 30 minutes
   3 5 to 15 minutes
   4 Around the house only
   5 Unable to walk at all because of severe pain.

3. Have you been able to walk on uneven ground?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 Extreme difficulty
   5 No impossible.

4. Have you had to use an orthotic (shoe insert), heel lift, or special shoes.
   1 Never
   2 Occasionally
   3 Often
   4 Most of the time
   5 Always

5. How much has pain from your ankle interfered with your usual work (including housework and hobbies)?
   1 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 Totally

6. Have you been limping when walking because of your operated on ankle?
   1 No days
   2 Only one or two days
   3 Some days
   4 Most days
   5 Every day

7 Have you been able to climb a flight of stairs.
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 Impossible

8. Have you been troubled by pain from your operated on ankle in bed at night?
   1 No nights
   2 Only one or two nights
   3 Some nights
   4 Most nights
   5 Every night

9. How much has pain from your operated on ankle interfered with your usual recreational activities?
   1 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 Totally

12 Have you had swelling of your foot
   1 None at all
   2 Occasionally
   3 Often
   4 Most of the time
   5 All the time

13 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 ankle.
   1 Not at all painful
   2 Slightly painful
   3 Moderately painful
   4 Very painful
   5 Unbearable

12 Have you had any sudden severe pain – shooting, stabbing or spasms from your operated on ankle?
   1 No days
   2 Only 1 or 2 days
   3 Some days
   4 Most days
   5 Every day

Additional Information

Have you at any time been hospitalised because:

	Yes	No	Approx Date
The artificial joint dislocated?	°	°	……
The joint became infected?	°	°	……

or for any other reason related to the artificial joint ……..

Hospital admitted to: ……..

π I wish to receive a progress report on the study. 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.

TOTAL ELBOW REPLACEMENT - QUESTIONNAIRE

Patient Name: …… Date of Birth: ……..

Patient Address: …… Operating Surgeon: ……..

…… Date of Surgery: ……..

We would like you to score yourself on the following 12 questions. Each question is scored from 1 to 5, from least to most difficulty or severity: 1 being the least difficult/severe and 5 being the most difficult/severe. Please circle the number which best describes yourself OVER THE LAST 4 WEEKS Which is your dominant arm? Left Right

Please circle the SIDE on which you had your surgery performed Left Right

1. How would you describe the ***worst*** pain you have had from your operated on elbow?
   1 None
   2 Mild
   3 Moderate
   6 Severe
   7 Unbearable

2. Have you had any trouble dressing yourself because of your operated on elbow?
   1. No trouble at all
   2 A little bit of trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

3. Can you lift a teacup safely with your operated on arm?
   1. No trouble at all
   2 A little bit of trouble
   3 Moderate trouble
   4 Extreme difficulty
   5 Impossible to do

4. Have you been able to get your hand to your mouth?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

5. Could you carry the household shopping with your operated on arm?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

6. Could you carry a tray containing a plate of food across a room?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

7 Could you brush/comb your hair with the affected arm?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, Impossible

8. How would you describe the pain you ***usually*** have from your operated on elbow?
   1 None
   2 Very mild
   3 Mild
   4 Moderate
   5 Severe

9. Could you hang your clothes up in a wardrobe – using the operated on arm?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

14 Have you been able to wash and dry yourself under both arms?
   1 Yes, easily
   2 With little difficulty
   3 With moderate difficulty
   4 With extreme difficulty
   5 No, impossible

15 How much has pain from your operated on elbow interfered with your usual work hobbies or recreational activities (including hobbies and housework)?.
   2 Not at all
   2 A little bit
   3 Moderately
   4 Greatly
   5 Totally

12 Have you been troubled by pain from your operated on elbow in bed at night?
   1 No nights
   2 Only 1 or 2 nights
   3 Some nights
   4 Most nights
   5 Every night

Additional Information

Have you at any time been hospitalised because:

	Yes	No	Approx Date
The artificial joint dislocated?	°	°	……..
The joint became infected?	°	°	……..

or for any other reason related to the artificial joint ……..

Hospital admitted to: ……..Hospital admitted to: ……..

I wish to receive a progress report on the study. . 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.