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Preface

The present 2004 annual report of the Danish Hip Arthroplasty Registry (DHR) reviews the 47,258 total hip arthroplasties and the 8,289 revision hip arthroplasties performed during 1995-2003. The Steering Group hopes that this report will be instrumental in assisting ongoing work aimed at furthering the quality of treatment both locally and nationally.

Before examining the results presented in the report, it is recommended to read the first pages, including the below guideline for interpretation of the survival analyses.

The past year has seen a welcome development in the form of a steady rise in DHR activities at several levels. The participating departments have hence been more active in contacting the DHR to obtain the Registry's guidance on specific problems or to obtain data on departmental activities. The DHR has also initiated a number of research projects and some of this research has now been disseminated in the form of scientific papers, presentations and posters. The research potential of the DHR will continue to expand because the follow-up period is continually growing, as is the aggregate number of operations performed, and we therefore have reason to believe that the positive developments within research will continue and be further buttressed.

DHR activities are currently expanding owing to the initiation of a nation-wide registration of pelvic osteotomies (Ganz surgery). Close orchestration between the DHR and the shoulder arthroplasty database, which is currently being launched, is also expected.

The hip data base is being continuously updated and the registration charts are being extended concurrently with the advent of new treatment possibilities.

The DHR is dependent on cooperation with the reporting departments, and this cooperation generally works well as evidenced, among others, by the accumulation of valid data in the data base. Data were submitted in electronic format by 16 and in tabular format by 29 of the 45 departments reporting to the DHR in 2003. The present IT platform is not up-to-date and will have to be replaced within a relatively short period. If the requisite economic means can be raised, the Steering Committee intends to move the DHR data to an internet-based contents management system (KMS) during 2005-2006. Most of the departments will already know the KMS, among others from the National Indicator Project. The system implies that data will have to be entered by the departments themselves and not by the DHR Secretariat and some departments will therefore have to change their DHR data collection routines. The Steering Committee is conscious of this challenge, and the DHR will do its best to assist the departments so that this transition phase is accomplished as well as possible. The implementation of a new data entry procedure will be preceded by a meticulous information campaign and will be undertaken gradually to ensure continuity of data registration.

As in previous years, this report will be sent to all participating wards, hospital owners, the Danish National Board of Health, the Association of Danish Counties and the Danish Orthopaedic Society. Participating departments will also receive a local report allowing them to compare their own performance with the national performance. The results will also be presented at the autumn meeting of the Danish Society of Hip and Knee Arthroplasty which will furthermore provide a forum for a general discussion of DHR activities.

Work is currently ongoing to complete the DHR web-site, which will be available at www.dhr.dk within a few months. The web-site will contain information about DHR activities and the annual

report can be accessed from this site. The significant amount of work it took to design the website was generously provided by clinical assistant Mrs. Alma B. Pedersen.

Organisation

The DHR was founded on 1 January 1995 with the main purpose of monitoring the quality of all total hip arthroplasties in Denmark.

The DHR Steering Committee counts the following members:

Ulf Lucht, MD, Consultant, The Aarhus Hospital (Head of the DHR)
Poul Torben Nielsen, Consultant, Aalborg Hospital
Jens Repten, Head of Clinics, The [Rigshospitalet]
Per Kjærsgaard-Andersen, Consultant, Vejle Hospital (representative of the Danish Society of Hip and Knee Arthroplasties)
Professor Søren Overgaard, MD, Consultant, Odense University Hospital (representative of the Danish Orthopaedic Society)
Søren Paaske Johnsen, PhD, Head of Research, Aarhus University Hospital (representative of The Centre of Competence North)
Poul Barthels, Hospital Medical Director, Aarhus County (representative of the County of Aarhus).

The DHR secretariat is located at Aarhus Hospital, Department E of Orthopaedic Surgery. The administrative services of the secretariat are performed by Mrs. Anne Hjelm, secretary, and Mr. Ulf Lucht, Consultant. The DHR is affiliated to the Centre of Clinical Databases, Department of Clinical Epidemiology, the Aarhus University Hospital (The Centre of Competence North).

The daily activities of the DHR are financed by the hospital owners' collective funds for nationwide clinical quality databases. The amounts appropriated for 2004 is DKK 500,000.

Data

Data validity, *i.e.* the completeness and the quality of the data gathered, must be considered when reading the report and interpreting its data.

Completeness of patient registration

Completeness of patient registration is defined as:

Number of individuals registered in the database having had the operation in question
Total number of individuals having had the operation in question registered at a hospital

Completeness hence answers the question: To which extent does the fraction of patients registered with a given operation at a hospital match DHR data?

The DHR aims to include all total hip arthroplasties and revisions to ensure that the database yields an accurate picture of the quality of treatment in Denmark, but no recent detailed analyses have been performed to ascertain to which extent this is so. However, a recently published study by AB Petersen et al. compared patient registration in the Danish National Patient Registry (LPR) with the DHR for the period 1995-2000 (2). The study reported as follows concerning the completeness of the patient registration:

- Completeness was generally high. Thus, 94% of all patients registered in the LPR were also registered in the DHR.
- The completeness was lower for revisions (81%) than for primary operations (94%).
- Completeness seemed not to be associated with patient age or sex.
- Completeness was lower at university hospital departments (91%) than at other departments (95%). Completeness was also lower at departments where surgical activity levels were relatively low, *i.e.* <500 operations during 1995-2000 (87%), than at departments where activity was at a medium (500-799 operations) (92%) or high level (>800 operations) (96%).

It is well-known that the LPR is not a perfect reference database because of the occasional erroneous coding of diagnoses during the course of a clinical workday. The above statements concerning completeness should therefore be regarded as indicative of the real completeness.

It has previously been difficult to procure up-to-date LPR data for assessment of completeness in connection with the publication of the annual report. This problem has, however, been solved for the present year and as from next year it will be possible to present an assessment of the completeness obtained during the preceding year.

Completeness of variable

The validity of the database hinges not only on the completeness of patient registration, but also on the completeness of data registration for the individual patients. As appears from the descriptive tables below, the completeness for all variables listed in the registering form A border on 100%. This high degree of completeness has been obtained owing to combination of meticulousness of data registration at the individual wards and the follow-up undertaken by the DHR, which constitutes one of the main strengths of the DHR. As will be known, the registering form B, which features ambulatory control, is an optional registration facility which translates into a significantly lower degree of completeness for information in this stable. If non-registration is random, even a relatively low degree of completeness will not necessarily prevent data from reflecting the quality of the data. However, if particular groups of patients, *e.g.* patients who either have a particularly good or bad prognosis, are less inclined to be registered, we will be facing a systematic source of error in data registration (selection bias) and interpretation of the data will be hampered. It is often difficult in practice to decide to which extent lacking completeness is random or due to selection bias, a difficulty that also applies to Table B. In general, data about completeness of variable should therefore be interpreted with caution.

Quality of registered data

In practice appreciation of the quality of the registered data, *i.e.* the extent to which they reflect reality, requires sample validation of the registered procedures. Such validation was undertaken for a selection of variables in a study of 700 random procedures performed by AB Pedersen et al. (2). The validation included a standardised review of all journals, including reassessment of the radiographs. In doubtful cases the final decision on data classification was taken at a consensus meeting between three experienced hip surgeons.

The following general trends were observed concerning the quality of the registered data:

- In general, the diagnosis indicating primary operation was confirmed in 84% of the patient samples.
- The positive predictive value was relatively high (>80%) for all diagnoses except recent proximal femoral fracture, where only 30% of the diagnoses were confirmed.

- The registered postoperative complications were confirmed upon review in 67% of the cases. For postoperative complications, the sensitivity was 90%, the specificity 34%.

In conclusion, the registration of patients and variables in the DHR enjoyed a high level of completeness during the period 1995-2000. Furthermore, the quality of the data registered for a selection of variables seemed to have been high, but caution should be exercised when interpreting the data concerning specific diagnoses and the prevalence of postoperative complications.

Guideline for interpretation of survival analyses

Like previous years, the annual report contains a number of tables and graphs showing prosthesis survival.

Tables

The tabular form is used for analyses of multiple categories of patients, *e.g.* analysis of prosthesis survival for different categories of prosthesis combinations and for analysis of individual departmental performance levels. The tables state the time periods for which data are available within a particular category (*e.g.* the prosthesis combination Charnley Ogee – Bi-metric without collar was used during the entire period 1995-2003, whereas the combination Charnley Ogee – C-stem has only been used from 2001-2003), the number of operations registered within that particular category and the absolute implant survival rates after 3, 5 and 8 years. A 100% survival rate is, by definition, the starting point when the follow-up period begins, which is immediately after the operation. In order to obtain an impression of the statistical precision of prosthesis survival, we have also given 95% confidence intervals (CI). These intervals indicate the extent to which random variation explains the registered survival and they are tied closely to the number of operations included in the analysis. A broad confidence interval indicates a considerable amount of uncertainty about the actual prosthesis survival, whereas a narrow interval indicates that prosthesis survival is less open to random variation. Please note that the confidence intervals cannot always be used to determine if there is a statistically significant difference between two or more prosthesis combinations.

Absence of absolute prosthesis survival values for a specific category indicates that the required minimum follow-up period of either 3, 5 or 8 years has not yet elapsed for any of the operations in question.

Unlike previous reports, this annual report does not offer adjustment for age and gender distributions over time. This decision has been taken in light of the relatively modest effect of such adjustments on the interpretation of the results.

Graphs and figures:

The graphical presentation analyses patient materials either in their aggregate or as separate, smaller categories. In the Kaplan-Meier curves, the X axis gives the time in years, the Y axis the prosthesis survival rates. This may cause the inattentive reader to overestimate differences in prosthesis survival rates.

In order to better illustrate the statistical precision of the analyses, 95% CIs are listed around the curve in graphs showing singular survival curves. In graphs featuring more than a single curve,

Cox regression analysis has been used to compare different categories; thus, calculated hazard ratios and their 95% CIs can be interpreted as measures of the relative risk. Hazard ratios thus compare revision incidences between two different patient groups. When the hazard ratio is 1.00, there is no difference in revision incidence between the two patient groups. However, a hazard ratio <1 indicates that a given patient group enjoys a lower revision incidence than its reference group.

If the quoted 95% CI for hazard ratio does not reach 1.00, we may conclude that revision incidence for the patient group in question differs from that of the reference group and that it is likely that this difference cannot be explained by random variation. In other words, we are facing a statistically significant difference. However, if the 95% CI does reach 1.00, we cannot determine whether the revision incidences of the two groups differ.

Example: In an analysis of all patients with primary hip arthroplasty in whom first revision was the end point, the hazard ratio was 0.49 (95% CI: 0.35-0.69) when patients above the age of 74 years were compared with patients below 50 years of age. The incidence of first revisions was thus, relatively speaking, 51% lower among the former. The relatively narrow CI and the fact that we did not reach a hazard ratio of 1.00 indicates that the difference between these two patient groups has been established with a fair amount of precision and is unlikely to be attributable to random variation.

The report also features a graphical presentation by department of prosthesis survival in patients with primary arthrosis. The end point in these analyses is the first revision. This figure should be seen as a supplement to the table in question and it illustrates the fraction of patients with intact primary prostheses after 8 years of follow-up. A visual impression of how the individual hospitals compare at a national level can be obtained from analysis of the figure, which shows the corresponding 95% CIs for national comparison. These CIs are given as a function of the number of patients registered at the individual hospitals. Hospitals falling outside the 95% CI range thus have patients where prosthesis implant performance differs statistically significantly from the performance in the rest of Denmark.

Hybrid B prostheses (cemented cup and uncemented prosthesis) have not been included in the analyses due to the relatively low number of such registered cases and their limited follow-up time. The statistical precision of the estimates of the survival of these prostheses is therefore poor.

Results

Incidence: During 2003 the DHR registered a total of 5,970 primary operations and 1,023 revisions. The number of operations was hence slightly lower than in 2002, but there has been a clear rise in the incidence of total hip arthroplasties during the 1995-2003 as a whole. The increase has been most outspoken among 70-79-year-old women, but general increases have been observed both among young and old patients and among men and women.

The prevalence of cemented primary total hip arthroplasties has been declining continuously throughout the years. This trend has been matched by a concomitant rise in the prevalence of hybrid, especially uncemented primary total hip arthroplasties. This trend continued unabated during 2003: thus, about 1/3 of all patients had an uncemented prosthesis during 2003 compared with 1/10 of all patients 1995. Revisions followed a similar pattern.

Primary arthrosis retained its position as the far most frequent diagnostic indication for primary surgery. Thus, 78.5% of the patients received this diagnosis in 2003. Late sequelae from proximal femoral fracture accounted for another 8.7% and non-traumatic necrosis of the femoral head for 2.8%.

The average age at primary surgery remained fairly constant throughout the registration period for both men (66 years) and women (69.5 years).

Perioperative conditions: The DHR registration period saw growing use of flow operating theatres and almost all patients operated during 2003 received perioperative antibiotics prophylaxis and pharmacological thrombosis prophylaxis.

The posterior approach was used for both primary operations and revisions in more than 90% of the cases. It is also interesting to note that minimally invasive surgery was deployed for primary surgery in a limited number of patients during 2003.

The average duration of surgery continued to decline also in 2003, reaching an average of 79 minutes for primary surgery compared with 90 minutes in 1995. This decrease in the average duration of surgery since 1995 applies to all kinds of surgery and was also observed for revisions.

Cement and prosthesis types: Cemented hip arthroplasty without perioperative antibiotics declined significantly for both primary surgery and revisions. This development continued during 2003. Since registration of cement types began in 1997, twelve different types of cement have been used, with Palacos with antibiotics as the far most frequent type.

Danish departments of orthopaedic surgery have a long tradition for using many different types of prostheses. This trend seems to continue and during 2003 a total of 23 different types of acetabular components and 28 different types of femoral components were used in primary surgery. Attention should be paid to the relatively large number of component types because these components may be combined in a multitude of ways and some may be used with or without cement. This plethora of possible combinations narrows the statistical basis for assessment of the quality of treatment and the survival of the implant.

To this should be added the growing use of ceramic heads for modular prostheses. Thus, ceramic heads were used in 21.8% of all interventions during 2003.

Perioperative complications: The share of operations avoiding perioperative acetabular or femoral complications has been high throughout the reporting period. Thus, in 2003 acetabular complications were avoided in 98.6% and femoral complications in 97.6% of all primary operations.

The departments have been requested, as from 2003, to classify bone loss upon revision of acetabular as well as femoral components and such data are available for more than 80% of the revisions.

Ambulatory control: At the latest ambulatory control, *i.e.* more than 6 months after surgery, 94.1% of the patients having had primary surgery claimed to be satisfied or very satisfied with the result. The corresponding result for revisions was 88.2%. A high (90.8%) percentage of the patients reported no or only light pain upon ambulatory control at least 6 months after primary surgery. The corresponding percentage for revisions was 81.6%. It should, however, be noted that

these percentages are self-reported pain assessments, and that such data were only available for part of the treatment course, namely 61.7% for primary surgery and 53.9% for revisions. These results should therefore be interpreted with caution.

Prosthesis survival: The overall prosthesis survival after 9 years of follow-up came close to 93%. Age-stratified analyses clearly show that increasing age was associated with improved prosthesis survival. Hence, the hazard ratio for first revisions for all patients above 74 years reached 0.49 (95% CI: 0.35-0.69) compared with patients younger than 50 years. Among patients whose basic disease was primary arthrosis and in whom the first revision was indicated by aseptic loosening, the prosthesis survival after 9 years of follow-up was approx. 97%. Among these patients, age-stratified analyses also unanimously showed that rising age was associated with improved prosthesis survival.

Uncemented prostheses seem to compare favourably with cemented prostheses irrespective of age. Differences in survival seem to be most pronounced among younger patients, *i.e.* patients below 60 year of age, and least pronounced among the elderly patients. Among patients older than 74 years of age, comparisons were based on few operations and the results appeared inconclusive.

Implant survival of hybrid A prostheses showed a more diverse pattern than did cemented prostheses. We thus observed no differences among patients younger than 50 years, but hybrid A prostheses showed a better survival among patients aged 50-59 years. Among elderly patients, mainly the 60-70-year-olds, hybrid A prostheses, however, showed a poorer survival than cemented prostheses.

Prosthesis survival following revision reached approximately 82% after 8 years among patients who had had a first revision during the period 1995-2003. Revision survival was hence significantly lower than primary prosthesis survival. Survival was associated with the reason for the first revision. Hence, the incidence of a second revision was 2.7 higher among patients with deep infection and 1.6 times higher among patients with luxation than among patients with aseptic loosening. Patients undergoing a second revision had a subsequent 8-year prosthesis survival of about 69%.

Prosthesis survival following primary surgery at 3, 5 and 8 years was also calculated for different prosthesis combinations. These analyses were performed partly for all patients for whom a first revision was the end point, partly for patients for whom the end point was primary arthrosis with aseptic loosening. Differences were observed between the different combinations and for the same kind of operation. Thus, the 8-year survival ranged from 90.4 to 98.6% among patients with cemented arthroplasty. Statistically significant differences in prosthesis survival were also observed for several prosthesis combinations.

Finally, prosthesis survival is shown for the individual departments. Prosthesis survival was recorded following primary surgery for primary arthrosis with aseptic loosening as the end point in order to maximise comparability of patient data from different departments. The general picture was one of a high level of prosthesis survival, but some variation between departments was also indicated. Thus, survival ranged from 97.8 to 100% after 3 years of follow-up, from 95.0 to 100% after 5 years of follow-up and from 88.7 to 100% after 8 years of follow-up. Inter-departmental variation is also illustrated graphically. There seems to be no clear association between the number of patients operated at the individual departments and prosthesis survival rates. It is important to underline that these departmental results are reflecting survival in the long term (in some cases up to 8 years) and that they are, by definition, based on operations performed many

years ago. The survival thus reflects the results of treatment performed at the individual departments at that particular time and therefore not necessarily the expected prosthesis survival among patients operated at these departments during 2004. Some of the departments have thus identified problems of therapeutic quality years ago and have since introduced organisational and therapeutic changes expected to optimise therapeutic results in the years to come. These results will, however, not translate into recordable long-term prosthesis survival rates until after a number of years. In spite of these reservations, it is expected that the departmental variations recorded will inspire local consideration of the causes of these differences and potential measures to improve future prosthesis survival.

Summary

The below list summarises the important points and conclusions in the 2004 annual report of the Danish Hip Arthroplasty Registry (DHR):

- Following a very high level of activity in 2002, the number of primary operations declined slightly during 2003. The 1995-2003 reporting period has, however, seen an overall marked increase in the annual number of operations.
- Since its launch in 1995, the DHR has noted a strong tendency towards a decline in the share of cemented primary total hip replacements and a corresponding rise in the use of hybrid, especially uncemented, primary total hip replacements. This trend continued unabated during 2003, so that about one third of all patients had an uncemented prosthesis that year compared with about one tenth of all patients in 1995.
- Developments since 1995 have been positive in a number of respects: The number of patients operated in flow theatres was much higher in 2003 than in 1995 and largely all patients received perioperative antibiotics prophylaxis and pharmacological thrombosis prophylaxis. The period also saw a continuous decline in the average duration of operations, and the share of operations performed without giving rise to perioperative acetabular or femoral complications has been maintained at high level throughout the period.
- The general result of both primary operations and revisions seems to be good in terms of patient satisfaction and self-reported pain at ambulatory control more than 6 months after the operation. Hence, 94.1% of all patients having had a primary operation reported satisfaction or much satisfaction with the result.
- Prosthesis survival after 9 years of follow-up was overall 93%. Rising age was associated with increased prosthesis survival.
- Uncemented prostheses seemed to survive better than cemented prostheses.
- Danish departments of orthopaedic surgery traditionally deploy many different prosthesis types. Thus, 23 different types of acetabular components and 28 different types of femoral components were used in primary operations during 2003. This diversity is unfortunate in the light of the resultant paucity of data on the many combinations for evaluation of treatment quality and implant survival. Attention to this problem seems warranted, notably because there are clear indications of variations in prosthesis survival with different combinations of prostheses.

- Comparison of inter-departmental prosthesis survival rates following primary operation in patients with primary arthrosis showed an overall high level of prosthesis survival, but also some inter-departmental variation. It should be emphasised that comparisons of 8-year prosthesis survival rates invariably reflect departmental surgical competences years ago and therefore do not necessarily reflect the expected prosthesis survival in patients operated at these departments in 2004. Inter-departmental variations in prosthesis survival should therefore be interpreted with caution, but such figures may presumably inspire local deliberation of procedures and prompt measures to optimise future prosthesis survival rates.
- New techniques are continuously being introduced as also reflected in the DHR 2003 data profile. Thus, 2003 saw the first registration in the DHR of the use of minimal invasive surgery for primary operations. This development underscores the need for continuous monitoring of the quality in total hip arthroplasties, both at the short and long term.

Aarhus, October 2004

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Consultant, MD
Head of the DHR

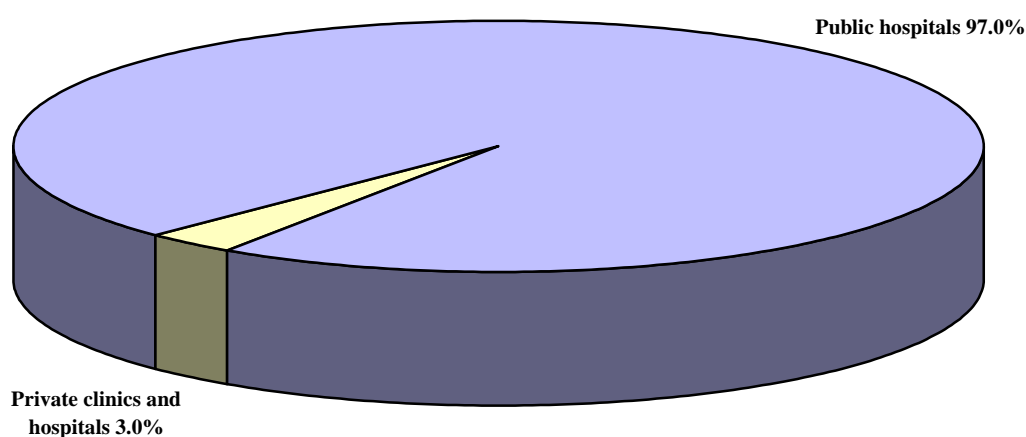
Søren Paaske Johnsen
Head of Research, PhD
Representative of The Centre of
Competence North

Number of total hip arthroplasties registered

Hospital	1995-1999		2000		2001		2002		2003		Total	
	prim	rev	prim	rev	prim	rev	prim	rev	prim	rev	prim	rev
Rigshospitalet	468	359	93	61	50	54	82	65	76	71	769	610
Amager Hospital	417	56	118	21	85	15	55	7	79	5	754	104
Bispebjerg Hospital	815	242	206	45	116	28	142	20	161	32	1440	367
Hvidovre Hospital	382	163	98	8	129	4	141	10	130	25	880	210
Frederiksberg Hospital	1101	108	332	19	313	10	334	24	379	31	2459	192
Privathospitalet Hamlet	658	30	128	6	160	7	140	12	111	8	1197	63
KAS Gentofte	524	91	111	27	134	21	166	28	99	21	1034	188
KAS Glostrup	538	128	129	24	124	26	158	38	117	40	1066	256
KAS Herlev	398	108	34	18	140	40	199	25	96	7	867	198
Gildhøj Speciallægeklinik	4	0	0	0	0	0	0	0	0	0	4	0
Erichsens Klinik	363	36	45	6	62	4	60	5	34	10	564	61
Hillerød Sygehus	595	348	46	72	30	87	55	73	37	77	763	657
Frederikssund Sygehus	514	11	0	0	0	0	45	0	31	0	590	11
Helsingør Sygehus	341	8	0	0	2	0	32	0	32	0	407	8
Hørsholm Sygehus	0	0	293	0	281	0	296	0	262	0	1132	0
Roskilde Amts Sygehus Køge	805	172	300	40	292	41	298	37	356	55	2051	345
Centralsygehuset i Holbæk	567	125	76	19	125	39	121	61	150	51	1039	295
Centralsygehuset i Slagelse	324	57	66	16	25	11	0	0	0	0	415	84
Ringsted Sygehus	206	1	173	0	166	0	215	0	211	0	971	1
Centralsygehuset i Næstved	403	108	82	18	89	24	115	29	122	18	811	197
Centralsygehuset i Nykøbing F	526	72	94	28	114	30	143	23	125	30	1002	183
Bornholms Centralsygehus	261	25	63	4	57	0	58	0	51	0	490	29
Sygehus Fyn Svendborg	565	65	151	8	150	12	264	11	152	6	1282	102
Odense Universitetshospital	479	141	115	38	109	56	159	34	115	59	977	328
Sygehus Fyn Middelfart	680	70	198	35	179	38	188	29	182	16	1427	188
Sønderborg Sygehus	586	48	138	12	117	19	111	60	112	46	1064	185
Haderslev Sygehus	292	47	53	9	58	11	127	1	78	0	608	68
Aabenraa Sygehus	618	21	150	2	135	4	176	14	149	9	1228	50
Sydvestjysk Sygehus Esbjerg	684	191	137	53	124	53	206	91	233	88	1384	476
Grindsted Sygehus	260	15	77	7	85	8	0	0	0	0	422	30
Fredericia Sygehus	303	0	92	0	76	1	97	0	102	1	670	2
Horsens Sygehus	554	51	96	5	75	12	79	14	85	3	889	85
Kolding Sygehus	654	125	117	36	104	21	149	30	175	24	1199	236

Hospital	1995-1999		2000		2001		2002		2003		Ialt	
	prim	rev	prim	rev	prim	rev	prim	rev	prim	rev	prim	rev
Vejle Sygehus	450	92	72	21	75	21	162	41	202	42	961	217
Mølholm-Klinikken	250	10	72	6	130	7	86	8	40	3	578	34
Holstebro Centralsygehus	692	218	132	32	168	49	190	38	158	35	1340	372
Herning Centralsygehus	455	59	67	5	76	13	120	6	80	2	798	85
Ringkøbing Sygehus	0	0	0	0	0	0	17	0	69	0	86	0
Silkeborg Centralsygehus	1297	196	251	40	276	51	374	70	345	55	2543	412
Århus Sygehus, Nørrebrogade	480	268	0	0	2	0	0	0	0	0	482	268
Århus Sygehus, Tage- Hansens Gade	129	24	69	50	98	51	108	68	106	58	510	254
Randers Centralsygehus	602	54	101	14	102	18	126	23	144	16	1075	125
Odder Sygehus	232	0	65	0	84	2	71	2	6	0	458	4
Grenå Sygehus	264	0	51	0	59	0	63	0	28	0	465	0
Viborg Sygehus	501	112	97	25	122	31	136	26	199	40	1055	234
Skive Sygehus	307	27	83	8	68	6	30	2	0	0	488	43
Thisted Sygehus	234	0	53	0	74	1	90	0	19	0	470	1
Aalborg Sygehus Syd	224	187	44	52	29	34	28	34	19	25	344	332
Hjørring Sygehus	505	50	94	9	102	4	173	0	15	0	889	63
Farsø Sygehus	826	4	283	1	292	1	288	3	296	14	1985	23
Frederikshavn Sygehus	282	1	96	0	54	0	51	0	194	0	677	1
Skørping Privathospital	75	3	33	4	52	2	30	3	8	0	198	12
Surgery abroad	0	0	0	0	1	0	0	0	0	0	1	0
Total	23690	4327	5474	904	5570	970	6554	1065	5970	1023	47258	8289

Registered cases, 2003



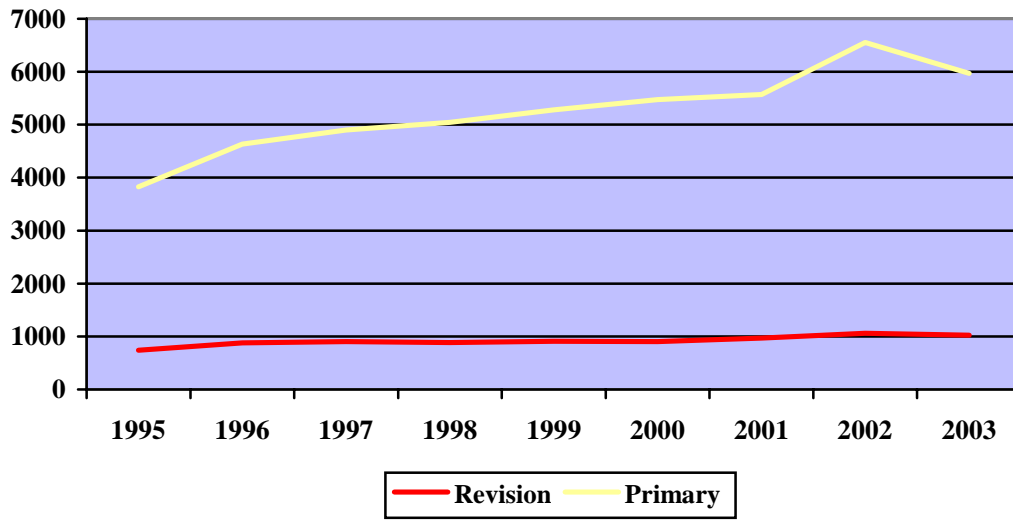
Number and types of surgery

Type of surgery	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Primary	23690	84.6	5474	85.8	5570	85.2	6554	86.0	5970	85.4	47258	85.1
Revision	4327	15.4	904	14.2	970	14.8	1065	14.0	1023	14.6	8289	14.9
Total	28017	100.0	6378	100.0	6540	100.0	7619	100.0	6993	100.0	55547	100.0

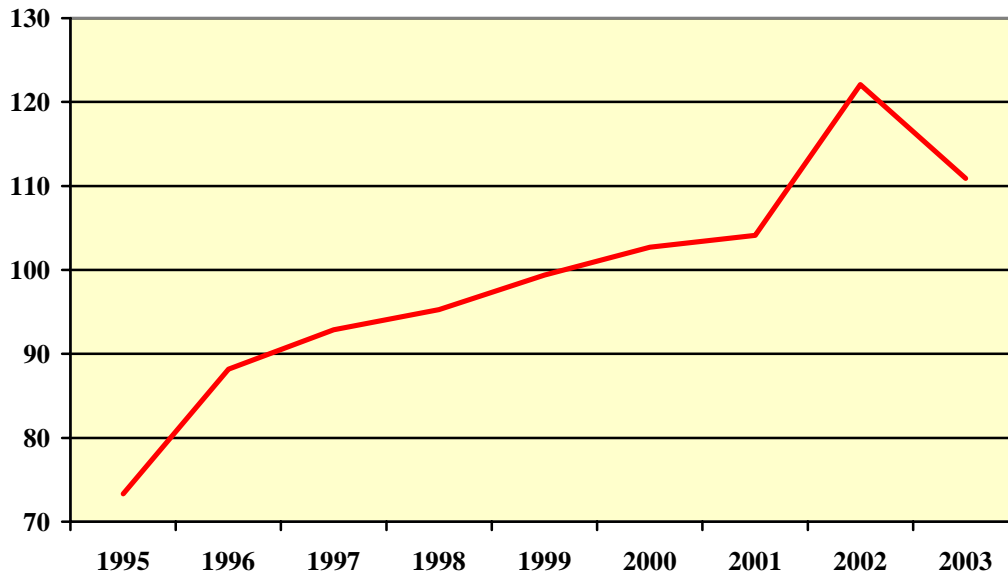
Number of operated patients with primary hip arthroplasty (1995-2003)

	n	%
One hip operated	34870	84.9
Both hips operated	6194	15.1
Total	41064	100.0

Number and types of surgery



Number of primary hip arthroplasties per 100,000 inhabitants



Types of surgery in primary total hip arthroplasty

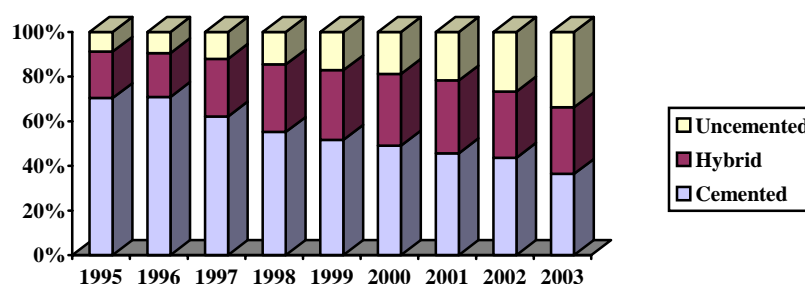
Type of surgery	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cemented	14510	61.4	2682	49.1	2533	45.6	2784	43.6	2157	36.4	24666	52.5
Hybrid	6130	25.9	1756	32.1	1815	32.6	1897	29.7	1769	29.8	13367	28.4
Uncemented	3012	12.7	1028	18.8	1209	21.7	1705	26.7	2005	33.8	8959	19.1
Total	23652	100.0	5466	100.0	5557	100.0	6386	100.0	5931	100.0	46992	100.0

Types of surgery in revision total hip arthroplasty*)

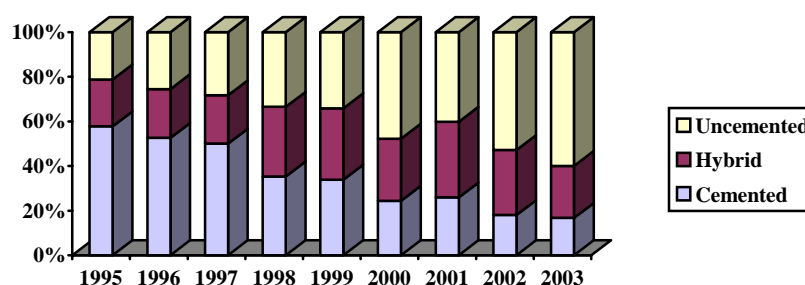
Type of surgery	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cemented	799	46.4	70	24.4	78	25.9	57	18.0	46	16.7	1050	36.2
Hybrid	435	25.3	80	27.9	102	33.9	92	29.1	64	23.3	773	26.6
Uncemented	489	28.4	137	47.7	121	40.2	167	52.9	165	60.0	1079	37.2
Total	1723	100.0	287	100.0	301	100.0	316	100.0	275	100.0	2902	100.0

*) Only revisions where both components are replaced are included.

Primary surgery



Revisions



Operated side

Side	Primary surgery		Revision	
	n	%	n	%
Right	25133	53.2	4316	52.1
Left	22125	46.8	3973	47.9
Total	47258	100.0	8289	100.0

Function group

Charnley group	Primary surgery		Revision	
	n	%	n	%
One hip affected	26389	55.9	4268	51.5
Both hips affected	18480	39.1	3368	40.6
Other functional disorder	2375	5.0	651	7.9
Total	47244	100.0	8287	100.0

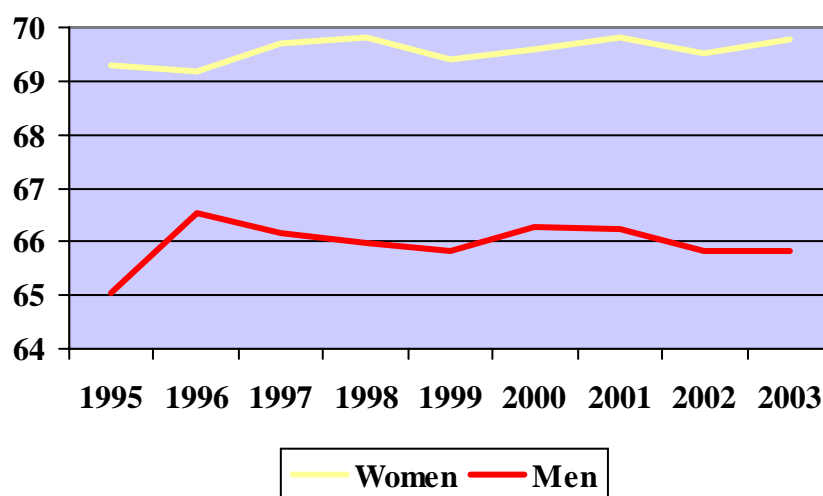
Gender distribution

Gender	Primary surgery		Revision	
	n	%	n	%
Women	27671	58.5	4408	53.2
Men	19587	41.5	3881	46.8
Total	47258	100.00	8289	100.0

Average age upon surgery

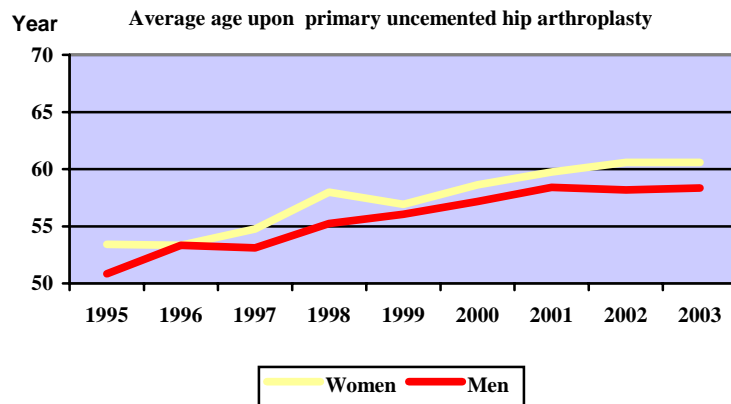
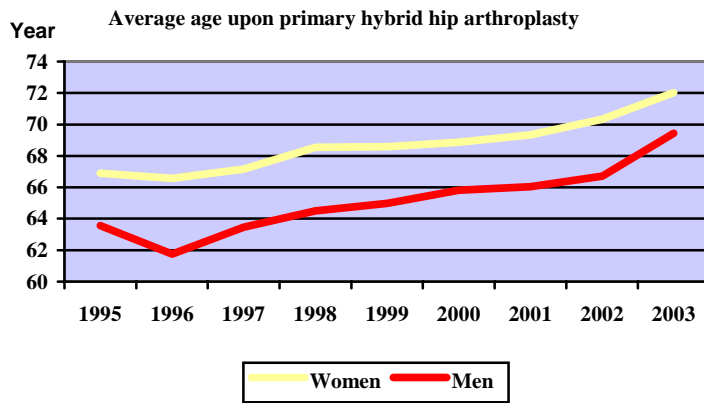
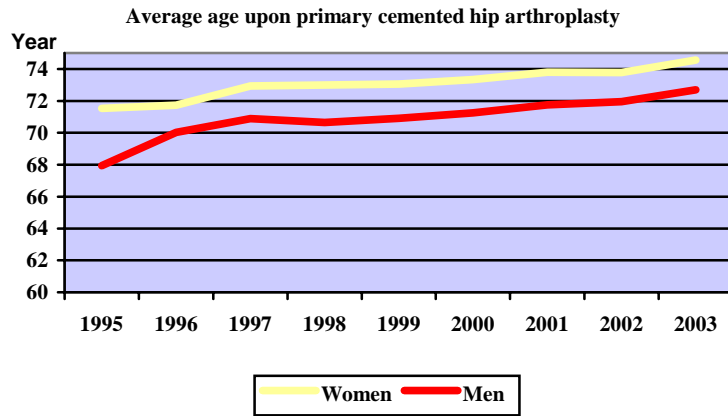
Gender	Primary surgery	Revision
Women	69.6	69.0
Men	66.0	67.0
Total	68.1	68.1

Average age upon primary surgery (all)



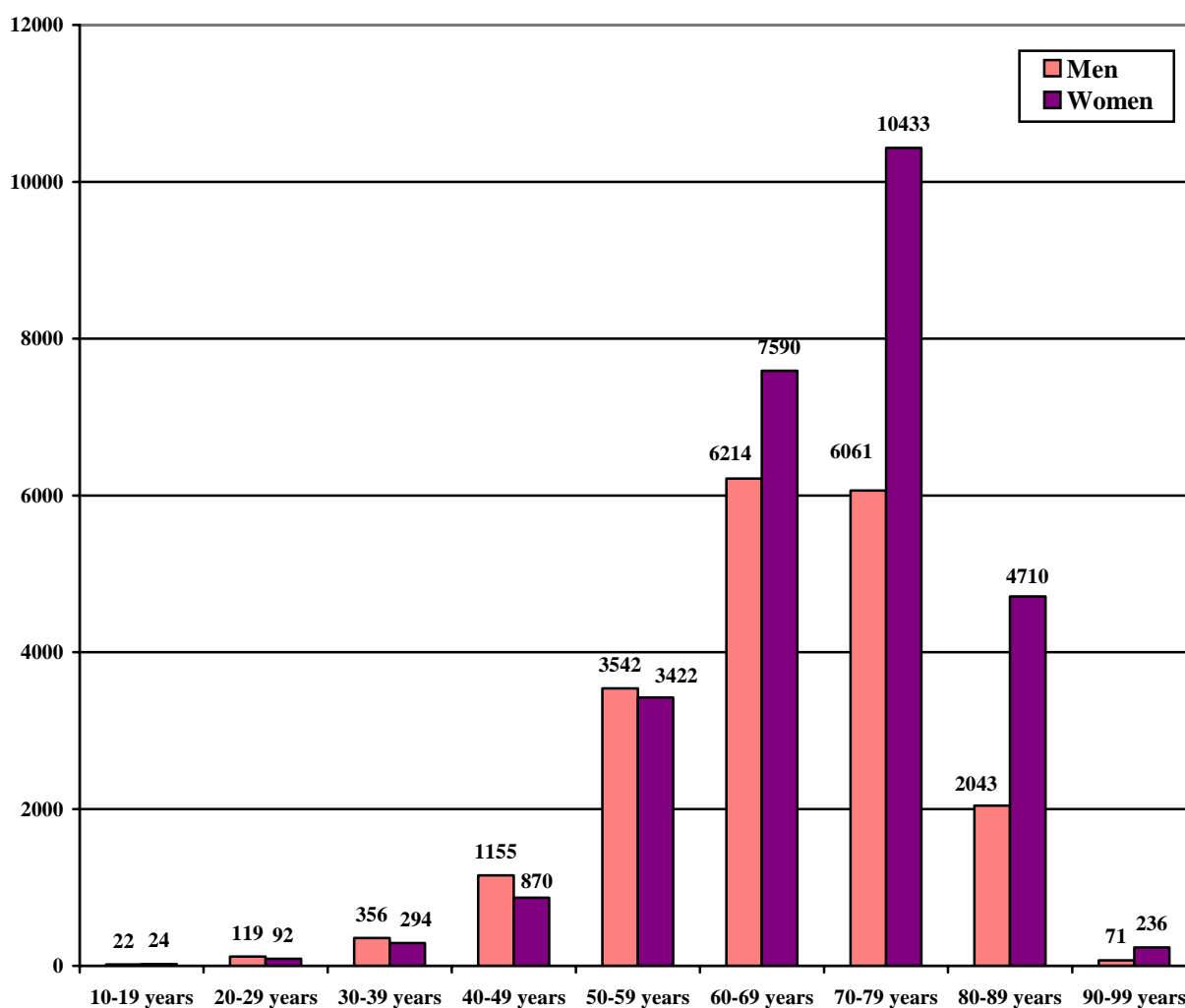
Average age upon surgery according to type of surgery (1995-2003)

Type of surgery	Primary surgery	Revision
Cemented	72.2	72.4
Hybrid	67.6	69.7
Uncemented	57.8	66.3
Total	68.1	68.1

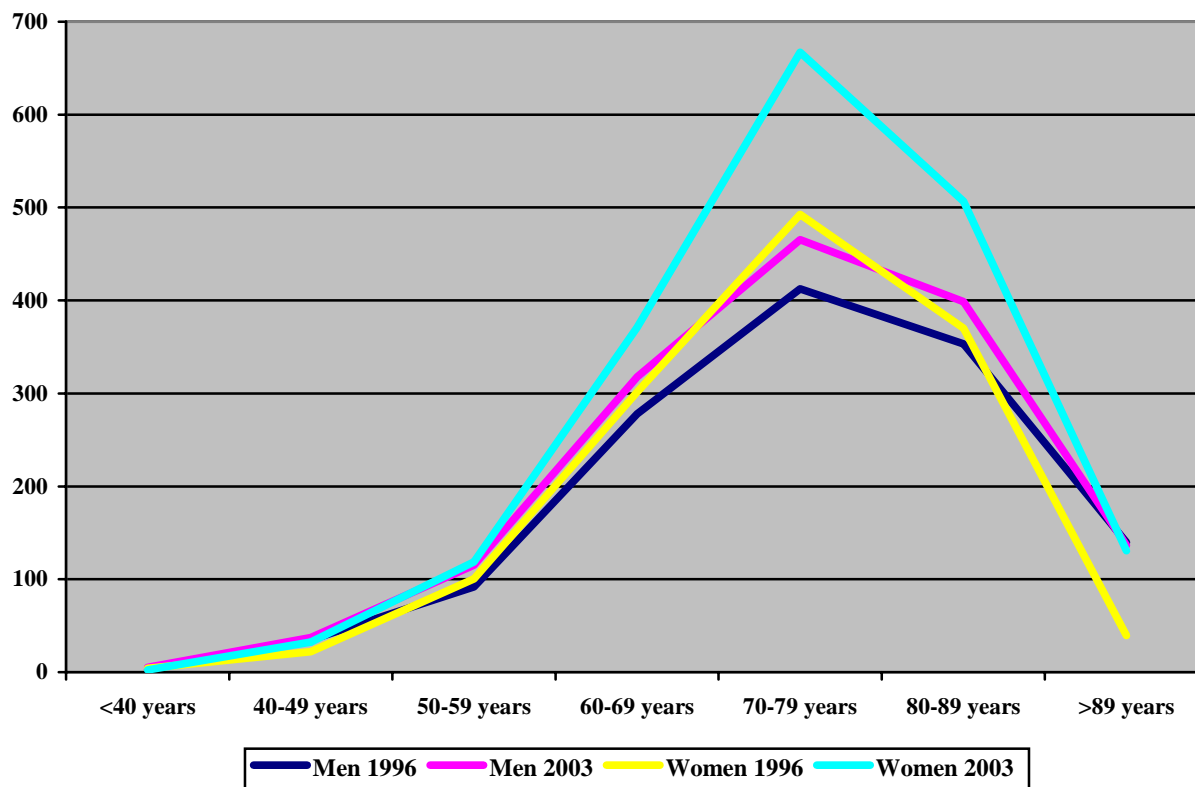


Age distribution upon primary surgery

Age	Men		Women		Total	
	n	%	n	%	n	%
10-19 years	24	0.1	22	0.1	46	0.1
20-29 years	92	0.3	119	0.6	211	0.5
30-39 years	294	1.1	356	1.8	650	1.4
40-49 years	870	3.1	1155	5.9	2025	4.2
50-59 years	3422	12.4	3542	18.1	6964	14.7
60-69 years	7590	27.4	6214	31.7	13804	29.2
70-79 years	10433	37.7	6061	31.0	16494	34.9
80-89 years	4710	17.0	2043	10.4	6753	14.3
90-99 years	236	0.9	71	0.4	307	0.7
Total	27671	100.0	19583	100.0	47254	100.0



**Number of primary total hip arthroplasties per 100,000 inhabitants
according to age groups
1996 and 2003**

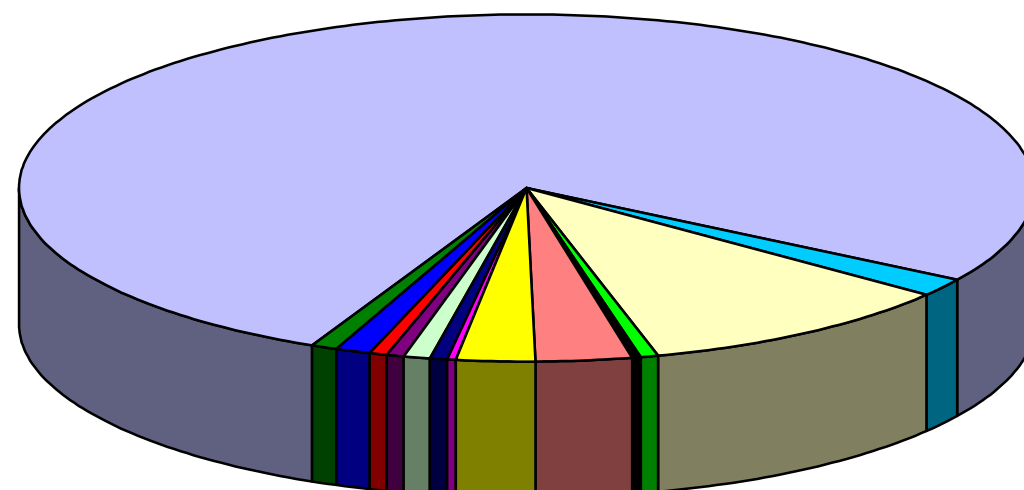


Primary hip arthroplasty in previously operated hips.

Previous surgery	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Osteosynthesis due to previous fracture of proximal femur	2380	71.0	521	68.8	476	67.7	540	68.6	483	69.2	4400	69.8
Hemiarthroplasty due to fracture	319	9.5	83	11.0	94	13.4	91	11.6	78	11.2	665	10.6
Surgery for acetabular fracture	82	2.4	20	2.6	14	2.0	20	2.5	18	2.6	154	2.4
Proximal femoral osteotomy	190	5.6	34	4.5	34	4.8	48	6.1	36	5.2	342	5.4
Other	385	11.4	99	13.1	85	12.1	88	11.2	83	11.9	740	11.7
Total	3356	100.0	757	100.0	703	100.0	787	100.0	698	100.0	6301	100.0

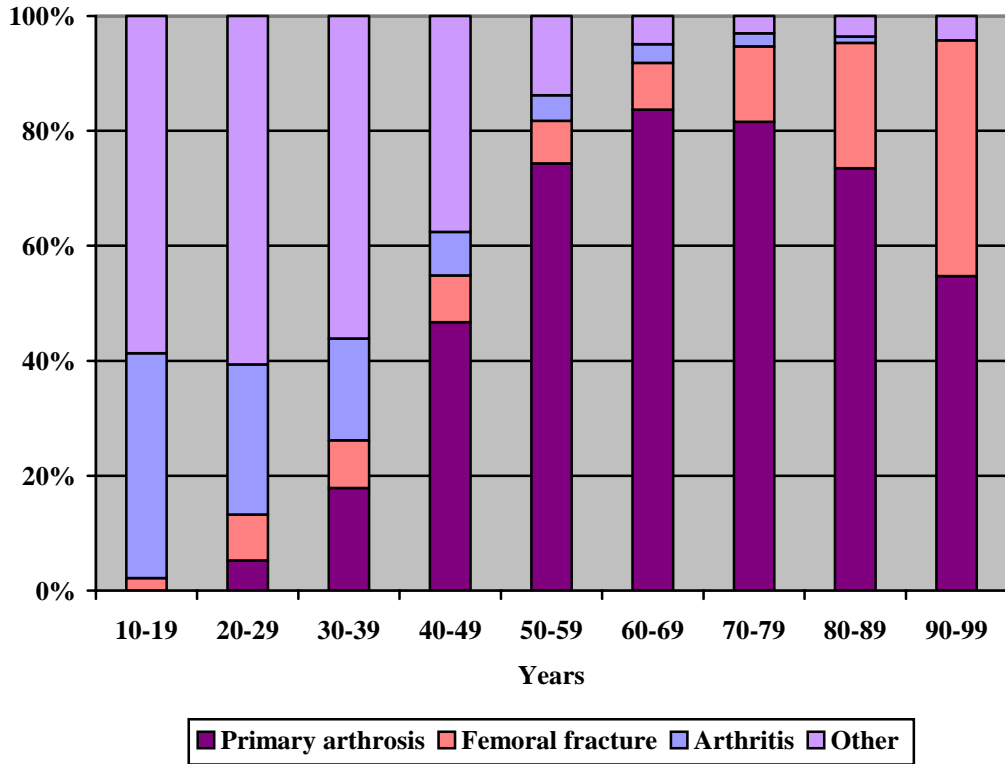
Diagnoses in primary surgery

Diagnosis	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Primary (idiopathic) arthrosis	17880	75.5	4230	77.3	4356	78.2	5190	79.2	4688	78.5	36344	76.9
Late sequelae from fracture of prox. femur	2584	10.9	561	10.3	520	9.3	615	9.4	518	8.7	4798	10.2
Atraumatic necrosis of femoral head	734	3.1	173	3.2	161	2.9	161	2.5	166	2.8	1395	3.0
Rheumatoid arthritis	733	3.1	126	2.3	124	2.2	114	1.7	110	1.8	1207	2.6
Fresh fracture of prox. femur	397	1.7	103	1.9	112	2.0	119	1.8	126	2.1	857	1.8
Acetabular dysplasia	224	1.0	47	0.9	75	1.4	84	1.3	90	1.5	520	1.1
Other	213	0.9	67	1.2	45	0.8	62	1.0	70	1.2	457	1.0
Congenital hip dislocation	262	1.1	38	0.7	40	0.7	47	0.7	58	1.0	445	0.9
Mb. Calvé-Legg-Perthes	146	0.6	22	0.4	30	0.5	40	0.6	45	0.8	283	0.6
Fracture of acetabulum	137	0.6	40	0.7	27	0.5	39	0.6	34	0.6	277	0.6
Other arthritis	138	0.6	27	0.5	33	0.6	21	0.3	25	0.4	244	0.5
Epiophysiolysis	105	0.4	22	0.4	26	0.5	23	0.4	16	0.3	192	0.4
Traumatic hip dislocation	72	0.3	8	0.2	13	0.2	27	0.4	11	0.2	131	0.3
Mb. Bekhterew	65	0.3	10	0.2	8	0.1	12	0.1	13	0.2	108	0.2
Total	23690	100.0	5474	100.0	5570	100.0	6554	100.0	5970	100.0	47258	100.0



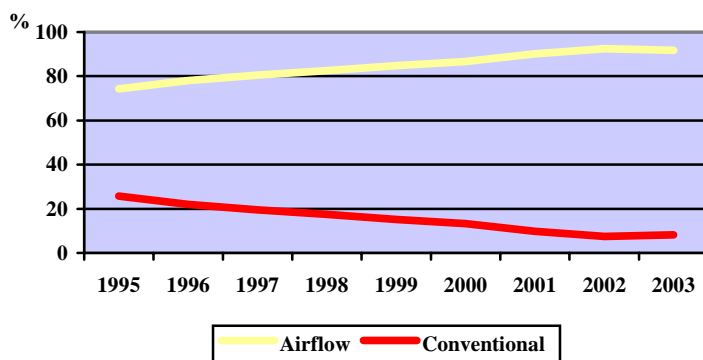
□ Primary arthrosis	■ Fresh fracture of proximal femur
□ Late sequelae from fracture of proximal femur	■ Fracture of acetabulum
■ Traumatic hip dislocation	■ Atraumatic femoral head necrosis
■ Rheumatoid arthritis	■ Mb. Bekhterew
■ Other arthritis	■ Congenital hip dislocation
■ Mb. Calvé-Legg-Perthes	■ Epiophysiolysis
■ Acetabular dysplasia	■ Other

Diagnosis groups in relation to age upon primary surgery (1995-2003)



Type of operating theatre

Operating theatre	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Airflow/greenhouse	22515	80.4	5527	86.7	5896	90.2	7037	92.5	6412	91.8	47387	85.4
Conventional theatre	5501	19.6	850	13.3	640	9.8	568	7.5	573	8.2	8132	14.6
Total	28016	100.0	6377	100.0	6536	100.0	7605	100.0	6985	100.0	55519	100.0



Intraoperative antibiotic prophylaxis

Antibiotics prophylaxis	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	27708	99.4	6355	99.6	6516	99.6	7600	99.8	6976	99.9	55155	99.5
No	174	0.6	23	0.4	23	0.4	18	0.2	9	0.1	247	0.5
Total	27882	100.0	6378	100.0	6539	100.0	7618	100.0	6985	100.0	55402	100.0

Antibiotic prophylaxis upon primary surgery

Antibiotic	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Zinacef	10236	43.7	2846	52.1	3223	58.0	3616	55.3	3248	54.5	23169	49.3
Diclosil	5721	24.4	1912	35.0	1787	32.2	2124	32.5	1835	30.8	13379	28.5
Dicillin	1650	7.0	407	7.5	380	6.8	445	6.8	452	7.6	3334	7.1
Other	1596	6.8	144	2.6	131	2.4	321	4.9	399	6.7	2591	5.5
Lucopenin	2499	10.7	0	0.0	4	0.1	2	0.0	0	0.0	2505	5.3
Axacef	865	3.7	75	1.4	14	0.3	6	0.1	9	0.2	969	2.1
Ekvacillin	542	2.3	58	1.1	2	0.0	0	0.0	0	0.0	602	1.3
Mandokef	257	1.1	0	0.0	0	0.0	0	0.0	0	0.0	257	0.5
Keflin	44	0.2	9	0.2	8	0.1	11	0.2	6	0.1	78	0.2
Gentamicin	18	0.1	5	0.1	3	0.1	13	0.2	2	0.0	41	0.1
Zinnat	7	0.0	3	0.1	1	0.0	0	0.0	2	0.0	13	0.0
Vancomycin	1	0.0	2	0.0	1	0.0	4	0.1	3	0.1	11	0.0
Abboticin	3	0.0	1	0.0	0	0.0	0	0.0	1	0.0	5	0.0
Keflex	1	0.0	0	0.0	1	0.0	1	0.0	0	0.0	3	0.0
Total	23440	100.0	5462	100.0	5555	100.0	6543	100.0	5957	100.0	46957	100.0

Antibiotic prophylaxis upon revision

Antibiotic	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Zinacef	1689	39.6	426	47.7	463	48.2	533	50.4	498	48.9	3609	44.0
Diclosil	923	21.6	257	28.8	267	27.8	243	23.0	239	23.5	1929	23.5
Dicillin	483	11.3	109	12.2	135	14.1	133	12.6	132	13.0	992	12.1
Other	493	11.6	63	7.1	83	8.6	129	12.2	132	13.0	900	11.0
Lucopenin	446	10.5	0	0.0	0	0.0	1	0.1	0	0.0	447	5.5
Axacef	120	2.8	26	2.9	6	0.6	9	0.9	10	1.0	171	2.1
Ekvacillin	68	1.6	3	0.3	1	0.1	0	0.0	0	0.0	72	0.9
Vancomycin	22	0.5	3	0.3	5	0.5	4	0.4	4	0.4	38	0.5
Keflin	7	0.2	3	0.3	1	0.1	3	0.3	3	0.3	17	0.2
Mandokef	12	0.3	0	0.0	0	0.0	0	0.0	0	0.0	12	0.1
Gentamicin	3	0.1	3	0.3	0	0.0	2	0.2	0	0.0	8	0.1
Keflex	2	0.1	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0
Abboticin	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	1	0.0
Total	4268	100.0	893	100.0	961	100.0	1057	100.0	1019	100.0	8198	100.0

Pharmacologic thrombosis prophylaxis

Thrombosis prophylaxis	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	27695	99.3	6335	99.3	6499	99.4	7554	99.2	6932	99.2	55015	99.3
No	185	0.7	43	0.7	40	0.6	63	0.8	54	0.8	385	0.7
Total	27880	100.0	6378	100.0	6539	100.0	7617	100.0	6986	100.0	55400	100.0

Anticoagulants	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Klexane	13335	48.2	2655	41.9	2074	31.9	1870	24.8	1886	27.2	21820	39.7
Fragmin	6833	24.7	2306	36.4	3274	50.4	3825	50.6	2806	40.5	19044	34.6
Innohep	5734	20.7	1271	20.1	1005	15.5	17.15	22.7	1788	25.8	11513	20.9
Anden *)	585	2.1	103	1.6	146	2.3	7	0.1	128	1.9	969	1.8
Logiparin	945	3.4	0	0.0	0	0.0	0	0.0	0	0.0	945	1.7
Arixtra	0	0.0	0	0.0	0	0.0	137	1.8	324	4.7	461	0.8
Tinzaparin	154	0.6	0	0.0	0	0.0	0	0.0	0	0.0	154	0.3
Noparin	109	0.2	0	0.0	0	0.0	0	0.0	0	0.0	109	0.2
Total	27695	100.0	6335	100.0	6499	100.0	7554	100.0	6932	100.0	55015	100.0

*) The number of 'other' anticoagulants was high in 1999, 2000 and 2001 owing to thromboprophylaxis projects, which prevent mentioning of the names of the drugs used.

Para-articular ossification prophylaxis upon primary surgery

Ossification prophylaxis	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
None	19059	80.5	4541	83.0	4668	83.9	5682	86.9	5456	91.6	39406	83.4
NSAID	4627	19.5	929	17.0	896	16.1	846	12.9	503	8.4	7801	16.5
X-ray	2	0.0	3	0.1	2	0.0	11	0.2	0	0.0	18	0.0
Total	23688	100.0	5473	100.0	5566	100.0	6539	100.0	5959	100.0	47225	100.0

Para-articular ossification prophylaxis upon revision

Ossification prophylaxis	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
None	3749	86.6	830	91.8	889	91.7	973	91.4	960	93.8	7401	89.3
NSAID	577	13.3	73	8.1	81	8.4	92	8.6	63	6.2	886	10.7
X-ray	1	0.0	1	0.1	0	0.0	0	0.0	0	0.0	2	0.0
Total	4327	100.0	904	100.0	970	100.0	1065	100.0	1023	100.0	8289	100.0

Anaesthesia in primary surgery

Anaesthesia	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Regional (spinal/epi)	16874	71.2	3750	68.5	4115	73.9	4916	75.4	4449	74.6	34104	72.2
Universal	6558	27.7	1606	29.3	1364	24.5	1495	22.9	1392	23.3	12415	26.3
Combined	240	1.0	116	2.12	86	1.6	110	1.7	115	1.9	667	1.4
Other	17	0.1	1	0.0	1	0.0	3	0.1	7	0.1	29	0.1
Total	23689	100.0	5473	100.0	5566	100.0	6524	100.0	5963	100.0	47215	100.0

Anaesthesia in revision

Anaesthesia	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Regional (spinal/epi)	1592	36.8	357	39.5	444	45.8	482	45.3	433	42.3	3308	39.9
Universal	2321	53.6	492	54.4	454	46.8	484	45.5	519	50.7	4270	51.5
Combined	410	9.5	55	6.1	72	7.4	95	8.9	66	6.5	698	8.4
Other	4	0.1	0	0.0	0	0.0	3	0.3	5	0.5	12	0.1
Total	4327	100.0	904	100.0	970	100.0	1064	100.0	1023	100.0	8288	100.0

Operative approach in primary surgery

Operative approach	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Posterior	21239	89.8	4912	89.8	4996	89.8	5923	90.6	5455	91.8	42525	90.2
Anterior	183	0.8	16	0.3	4	0.1	25	0.4	7	0.1	235	0.5
Lateral	2228	9.4	543	9.9	561	10.1	590	9.0	481	8.1	4403	9.3
Total	23650	100.0	5471	100.0	5561	100.0	6538	100.0	5943	100.0	47163	100.0

Operative approach in revision

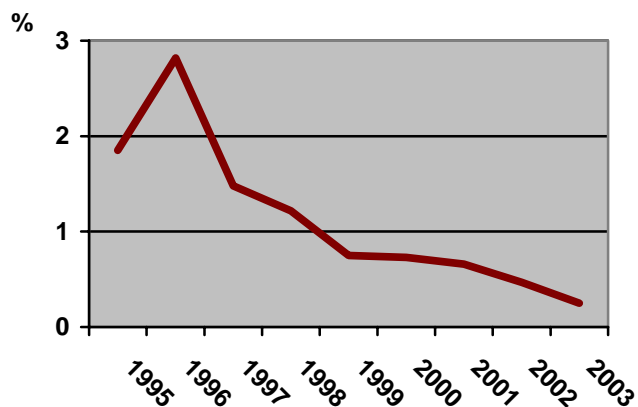
Operative approach	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Posterior	3754	86.8	796	88.4	873	90.2	985	92.6	930	91.0	7338	88.6
Anterior	27	0.6	5	0.6	1	0.1	0	0.0	1	0.1	34	0.4
Lateral	542	12.5	100	11.1	94	9.7	79	7.4	91	8.9	906	10.9
Total	4323	100.0	901	100.0	968	100.0	1064	100.0	1022	100.0	8278	100.0

Minimal invasive surgery in primary surgery (registered as from 2003)

MIS	2003	
	n	%
One incision	6	46
Two incisions	7	54
Total	13	100

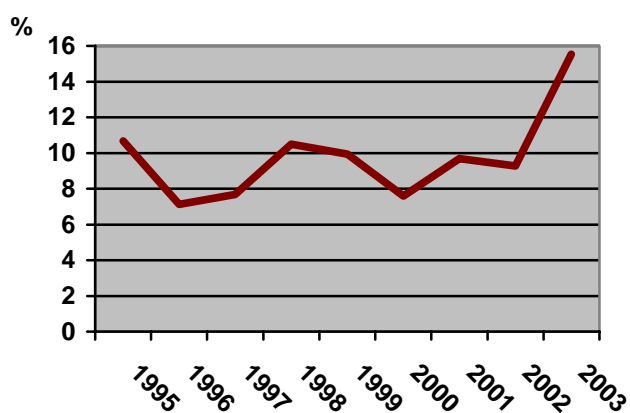
Trochanter osteotomy in primary surgery

Trochanter osteotomy	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	23314	98.4	5433	99.3	5529	99.3	6508	99.5	5946	99.8	46730	99.0
Yes	375	1.6	40	0.7	37	0.7	31	0.5	15	0.3	498	1.1
Total	23689	100.0	5473	100.0	5566	100.0	6539	100.0	5961	100.0	47228	100.0



Trochanter osteotomy upon revision of femoral component

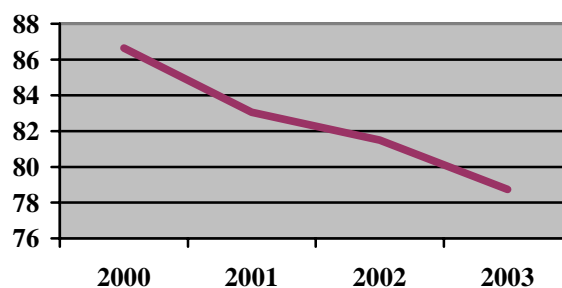
Trochanter osteotomy	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	2262	90.9	390	92.4	420	90.3	440	90.7	359	84.5	3871	90.3
Yes	226	9.1	32	7.6	45	9.7	45	9.3	66	15.5	414	9.7
Total	2488	100.0	422	100.0	465	100.0	485	100.0	425	100.0	4285	100.0



Duration of surgery (knife time) in primary surgery

Duration	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<=60 min.	3060	12.9	1267	23.2	1607	28.9	1952	29.8	1975	33.1	9861	20.9
61-120 min.	17563	74.1	3758	68.7	3569	64.1	4208	64.2	3721	62.3	32819	69.5
121-180 min.	2741	11.6	396	7.2	364	6.5	345	5.3	226	3.8	4072	8.6
181-240 min.	275	1.2	42	0.8	23	0.4	43	0.7	39	0.7	422	0.9
>240 min.	51	0.2	11	0.2	7	0.1	6	0.1	9	0.2	84	0.2
Total	23690	100.0	5474	100.0	5570	100.0	6554	100.0	5970	100.0	47258	100.0
Average			86.6		83.1		81.5		78.7			

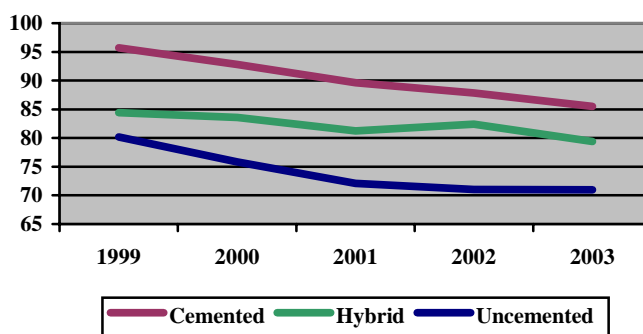
Average duration of surgery in minutes in primary surgery (knife time)



Average duration in minutes of primary surgery in relation to type of surgery

Type of surgery	1999	2000	2001	2002	2003
Cemented	95.7	92.8	89.6	87.8	85.5
Hybrid	84.4	83.6	81.3	82.4	79.4
Uncemented	80.2	75.8	72.1	71.0	71.0

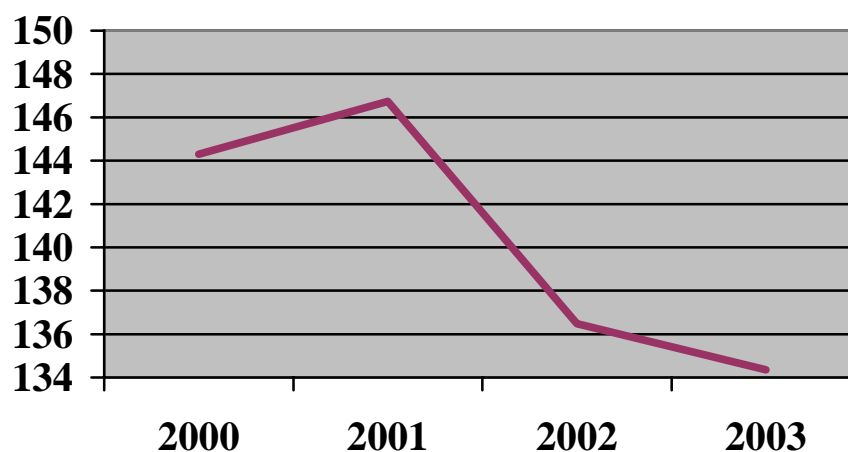
Average duration of surgery in primary surgery (knife time)



Duration of surgery (knife time) in revision

Duration	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
<=60 min.	281	6.5	74	8.2	105	10.8	113	10.6	135	13.2	708	8.5
61-120 min.	1372	31.7	345	38.2	335	34.5	445	41.8	414	40.5	2911	35.1
121-180 min.	1495	34.6	270	29.9	285	29.4	288	27.0	269	26.3	2607	31.5
181-240 min.	753	17.4	147	16.3	159	16.4	144	13.5	138	13.5	1341	16.2
>240 min.	426	9.9	68	7.5	86	8.9	75	7.0	67	6.6	722	8.7
Total	4327	100.0	904	100.0	970	100.0	1065	100.0	1023	100.0	8289	100.0
Average			144.3		146.7		136.5		134.4			

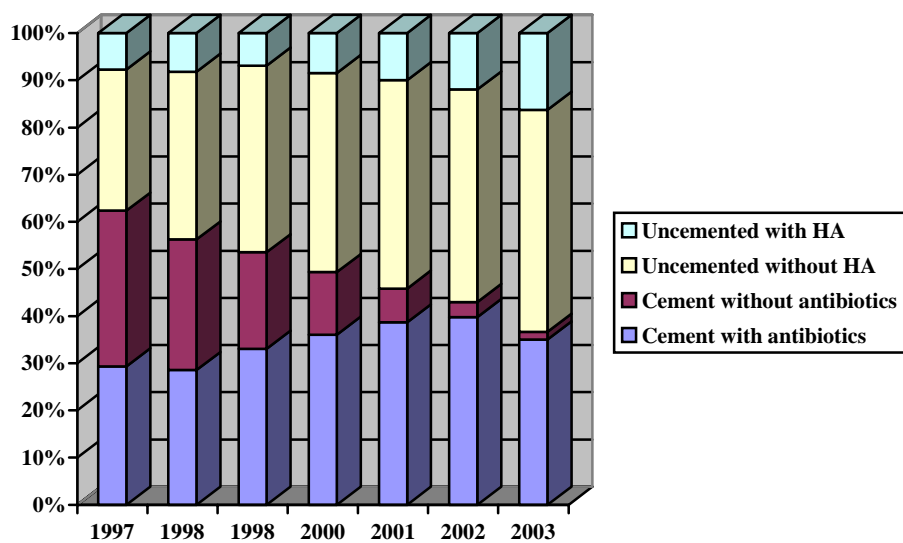
Average duration of surgery in revision (knife time)



Fixation of acetabular component in primary surgery*)

Fixation	1997-1998		1999		2000		2001		2002		2003	
	n	%	n	%	n	%	n	%	n	%	n	%
Cement with antibiotics	2858	28.9	1696	32.4	1973	36.1	2151	38.7	2599	39.8	2085	35.0
Cement without antibiotics	2997	30.3	1051	20.1	725	13.3	397	7.1	208	3.2	98	1.6
Uncemented with HA with screws	418	4.2	168	3.2	116	2.1	144	2.6	146	2.2	178	3.0
Uncemented without HA with screws	2011	20.4	1093	20.9	1194	21.8	1299	23.3	1602	24.5	1357	22.8
Uncemented with HA without screws	369	3.7	288	5.5	348	6.4	413	7.4	637	9.8	791	13.3
Uncemented without HA without screws	1224	12.4	935	17.9	1114	20.4	1159	20.8	1343	20.6	1446	24.3
Other	2	0.0	6	0.1	3	0.1	3	0.1	1	0.0	3	0.1
Total	9879	100.0	5237	100.0	5473	100.0	5566	100.0	6536	100.0	5958	100.0

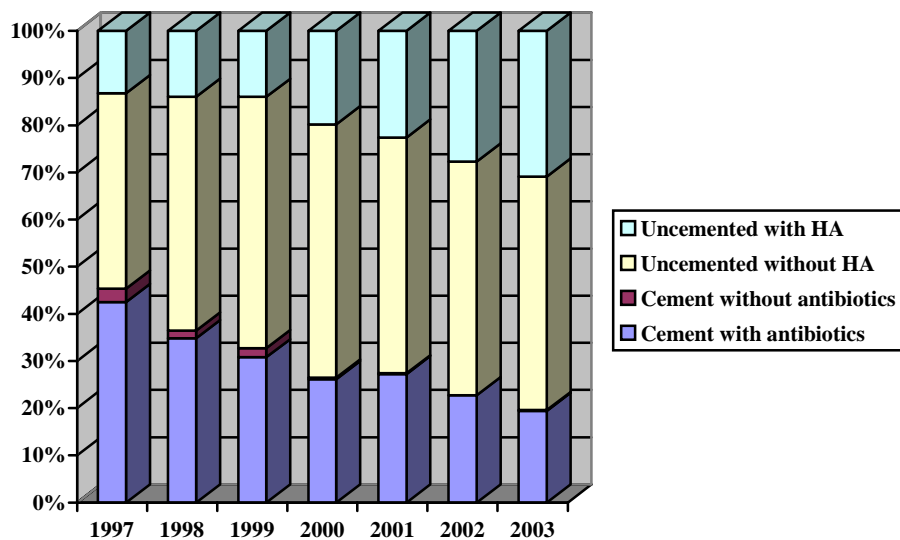
*) No registered data on HA coating of uncemented components prior to 1997.



Fixation of acetabular component in revision*)

Fixation	1997-1998		1999		2000		2001		2002		2003	
	n	%	n	%	n	%	n	%	n	%	n	%
Cement with antibiotics	482	36.7	189	30.8	157	26.0	171	27.1	165	22.7	129	19.4
Cement without antibiotics	28	2.3	12	2.0	2	0.3	1	0.2	0	0.0	1	0.2
Uncemented with HA with screws	148	11.9	72	11.7	85	14.1	97	15.4	141	19.4	155	23.3
Uncemented without HA with screws	477	38.3	272	44.3	291	48.3	291	46.0	334	45.9	303	45.6
Uncemented with HA without screws	21	1.7	14	2.3	34	5.6	45	7.1	60	8.3	50	7.5
Uncemented without HA without screws	88	7.1	55	9.0	32	5.3	23	3.6	26	3.6	26	3.9
Other	2	0.2	0	0.0	2	0.3	4	0.6	1	0.1	1	0.2
Total	1246	100.0	614	100.0	603	100.0	632	100.0	727	100.0	665	100.0

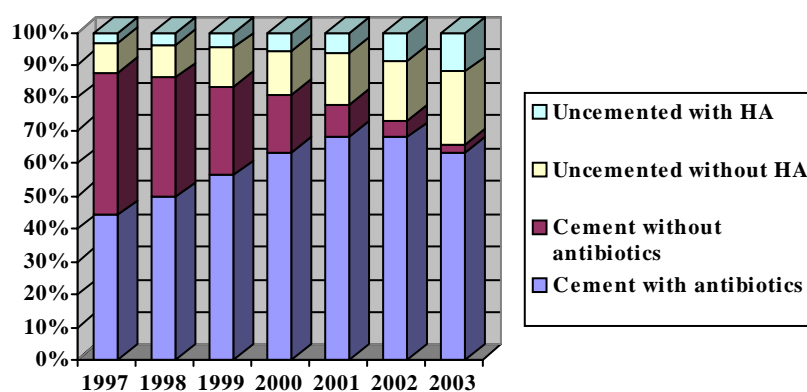
*) No registered data on HA coating of uncemented components prior to 1997.



Fixation of femoral component in primary surgery*)

Fixation	1997-1998		1999		2000		2001		2002		2003	
	n	%	n	%	n	%	n	%	n	%	n	%
Cement with antibiotics	4636	47.0	2950	56.4	3463	63.4	3793	68.3	4334	68.0	3762	63.5
Cement without antibiotics	3934	39.9	1399	26.7	961	17.6	544	9.8	328	5.2	144	2.4
Uncemented with HA	347	3.5	246	4.7	303	5.5	348	6.3	554	8.7	713	12.0
Uncemented without HA	938	9.5	625	12.0	736	13.5	868	15.6	1155	18.1	1307	22.1
Other	4	0.0	11	0.2	2	0.0	4	0.1	2	0.0	2	0.0
Total	9859	100.0	5231	100.0	5465	100.0	5557	100.0	6373	100.0	5928	100.0

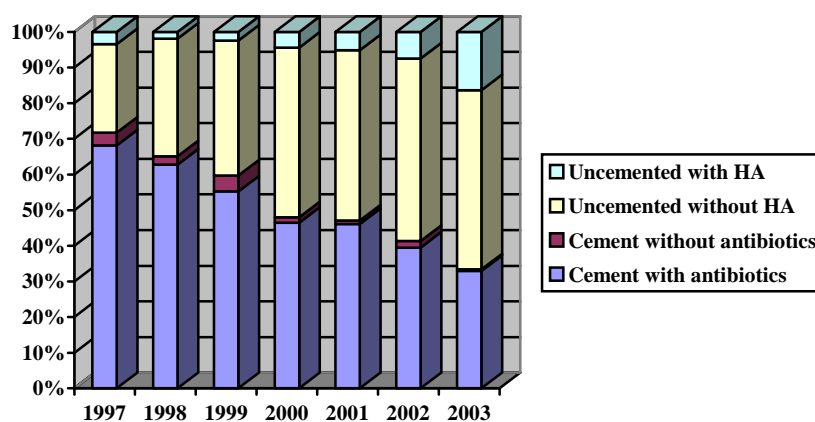
*) No registered data on HA coating of uncemented components prior to 1997.



Fixation of femoral component in revision*)

Fixation	1997-1998		1999		2000		2001		2002		2003	
	n	%	n	%	n	%	n	%	n	%	n	%
Cement with antibiotics	656	64.4	269	54.2	211	45.6	232	45.7	196	38.6	151	32.3
Cement without antibiotics	30	3.0	22	4.4	7	1.5	5	1.0	9	1.8	2	0.4
Uncemented with HA	27	2.7	12	2.4	20	4.3	26	5.1	37	7.3	75	16.0
Uncemented without HA	287	28.2	184	37.1	216	46.4	240	47.2	254	50.0	231	49.4
Other	18	1.8	9	1.8	10	2.2	5	1.0	12	2.4	9	1.9
Total	1018	100.0	496	100.0	463	100.0	508	100.0	508	100.0	468	100.0

*) No registered data on HA coating of uncemented components prior to 1997.



Type of cement, acetabular component*)

Type of cement	Primary		Revision		Total	
	n	%	n	%	n	%
CMW I with antibiotics	9	0.1	1	0.1	10	0.1
CMW I without antibiotics	408	2.2	1	0.1	409	2.0
CMW II with antibiotics	5	0.0	0	0.0	5	0.0
CMW III with antibiotics	963	5.1	37	2.8	1000	5.0
CMW III without antibiotics	39	0.2	0	0.0	39	0.2
Palacos with antibiotics	11036	58.8	997	74.7	12033	59.8
Palacos without antibiotics	2102	11.2	12	0.9	2114	10.5
Palacos low with antibiotics	531	2.8	71	5.3	602	3.00
Palacos low without antibiotics	75	0.4	0	0.0	75	0.4
Simplex with antibiotics	765	4.1	184	13.8	979	4.7
Simplex without antibiotics	2852	15.2	31	2.3	2883	14.3
Other cement with antibiotics	1	0.0	0	0.0	1	0.0
Total	18786	100.0	1334	100.0	20120	100.0

*) Registered as from 1997.

Type of cement, femoral component*)

Type of cement	Primary		Revision		Total	
	n	%	n	%	n	%
CMW I with antibiotics	41	0.1	1	0.1	42	0.1
CMW I without antibiotics	402	1.3	0	0.0	402	1.3
CMW III with antibiotics	1048	3.5	42	2.4	1090	3.4
CMW III without antibiotics	402	1.3	0	0.0	402	1.3
Palacos with antibiotics	19630	64.9	1401	78.6	21031	65.7
Palacos without antibiotics	3026	10.0	23	1.3	3049	9.5
Palacos low with antibiotics	716	2.4	123	6.9	839	2.6
Palacos low without antibiotics	80	0.3	1	0.1	81	0.3
Simplex with antibiotics	1491	4.9	140	7.9	1631	5.1
Simplex without antibiotics	3750	12.4	50	2.8	3800	11.9
Other cement with antibiotics	1	0.0	0	0.0	1	0.0
Total	30237	100.0	1782	100.0	32019	100.0

*) Registered as from 1997.

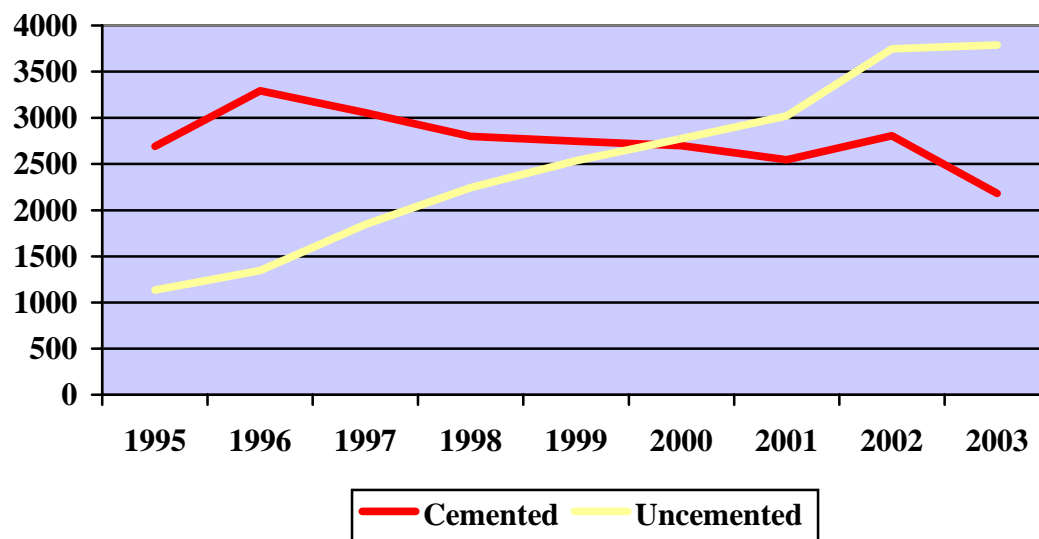
Acetabular components in primary surgery (cemented and uncemented)

Component	1995-99		2000		2001		2002		2003		Total
	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	
Trilogy	38	3218	15	1419	15	1514	18	1854	20	1847	9958
Lubinus	3393	0	709	0	707	0	742	0	601	0	6152
Exeter	3963	0	604	0	589	0	451	0	267	0	5874
Charnley	2615	0	325	0	289	0	468	0	171	0	3868
Universal	97	1689	26	523	12	490	3	402	3	429	3674
Müller	2658	0	338	0	188	0	128	0	43	0	3355
Mallory-Head	68	918	31	377	22	506	11	672	16	647	3268
ZCA	1043	0	429	0	474	0	533	0	532	0	3011
Duraloc	15	864	7	201	6	158	9	231	2	218	1711
Ranawat-Burstein	10	865	1	108	0	80	1	179	0	185	1429
Harris-Galante	8	1056	0	15	0	8	0	0	0	0	1087
Ultima	252	0	127	1	102	0	95	0	100	0	677
Plasmacup SC	3	64	0	83	1	112	0	188	1	211	663
SHP	25	0	55	0	113	0	151	1	187	0	532
Reflection	82	137	12	16	30	32	27	48	25	36	445
Contemporary	5	0	0	0	2	0	171	0	216	2	396
Saturne	0	0	0	13	0	74	0	90	1	138	316
Richards modular	201	0	0	0	0	0	0	0	0	0	201
PCA	5	185	0	0	0	0	0	0	0	0	190
Other	14	16	6	1	2	31	4	46	5	16	141
S-ROM	3	25	0	5	4	1	0	6	0	6	50
Hedrocel Implex	0	2	0	9	0	3	0	16	0	10	40
Vectra	0	38	0	0	0	0	0	0	0	0	38
P.F.C.	19	0	14	0	0	0	0	0	0	0	33
Wroblewski Angle	26	1	0	0	0	0	0	0	0	0	27
Scan HIP	23	0	0	0	0	0	0	0	0	0	23
AGB	2	16	0	0	0	0	0	0	0	1	19
Endurance	18	0	0	0	0	0	0	0	0	0	18
PE-cup	0	0	0	0	0	0	1	0	0	13	14
Anca-Fit	0	0	0	0	0	1	0	5	0	7	13
AML Solution	0	8	0	2	0	0	0	0	0	0	10
Link-Lidgren-Lund	0	0	0	0	1	0	1	0	3	0	5
Implex TMT	0	0	0	0	0	0	0	0	0	4	4
Bat-Cup	0	0	2	0	0	0	0	0	0	0	2
Saturne	0	0	0	0	0	0	0	1	0	0	1
Aesculap	1	0	0	0	0	0	0	0	0	0	1
Total	14585	9104	2698	2776	2548	3019	2807	3746	2183	3780	47246

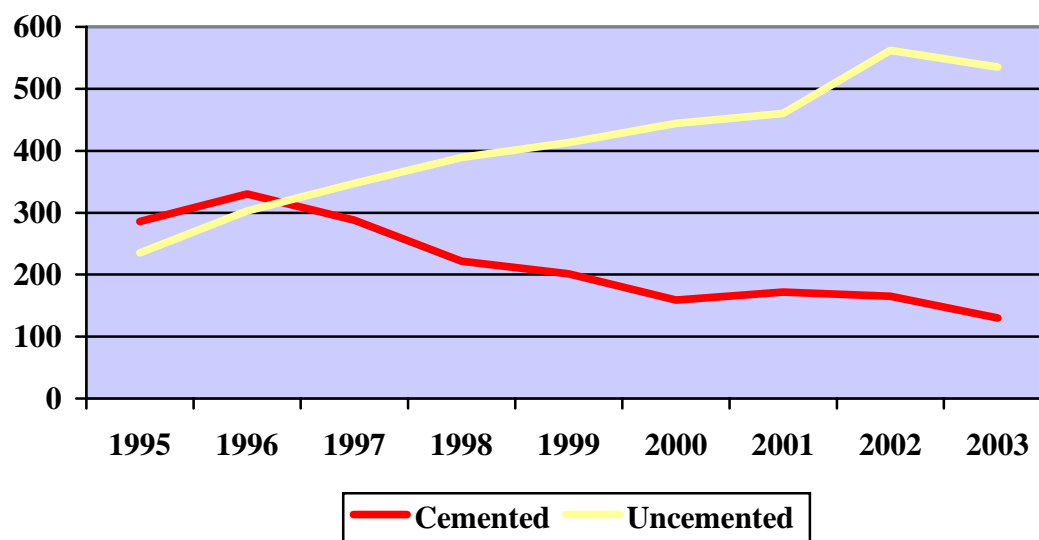
Acetabular components in revision (cemented and uncemented)

Component	1995-99		2000		2001		2002		2003		Total
	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	
Trilogy	1	433	2	200	1	206	5	250	3	194	1295
Ranawat-Burstein	4	393	0	84	0	99	0	117	0	136	833
Exeter	443	0	55	0	61	0	54	0	20	0	633
Mallory-Head	0	228	0	79	1	93	0	106	0	89	596
Lubinus	258	0	36	0	30	0	30	0	38	0	392
Müller	309	0	30	0	21	0	10	0	7	0	377
Universal	4	216	0	35	0	19	0	22	0	9	305
Duraloc	2	202	0	16	0	7	2	17	0	34	280
Charnley	154	0	11	0	16	0	12	0	8	0	201
Harris-Galante	5	136	0	2	0	2	0	0	0	0	145
ZCA	51	0	11	0	17	0	15	0	13	0	107
Saturne	0	0	0	4	0	13	1	28	1	30	77
AML Solution	0	41	0	12	0	5	0	0	0	0	58
Contemporary	16	0	0	0	0	0	13	0	14	0	43
S-ROM	1	25	0	7	0	4	0	2	0	3	42
Reflection	13	2	5	0	10	1	3	2	4	0	40
Plasmacup SC	0	3	0	1	0	5	0	5	0	19	33
Ultima	20	0	4	0	5	0	2	0	1	0	32
SHP	0	0	4	0	4	0	4	0	19	0	31
Other	2	2	1	1	2	1	7	2	1	4	23
Stanmore	13	0	0	0	2	0	4	0	2	0	21
Richards modular	13	0	0	0	0	0	3	0	0	0	16
Wroblewski Angle	11	0	1	0	0	0	0	0	0	0	12
PCA	2	9	0	0	0	0	0	0	0	0	11
Saturne	0	0	0	0	1	2	0	4	0	4	11
Procotyl-E	0	0	0	0	0	0	0	3	0	7	10
Bat-Cup	0	3	0	0	0	0	0	2	1	1	7
Octopus	0	3	0	2	0	0	0	1	0	1	7
Aesculap	2	0	0	0	1	3	0	0	0	0	6
Vectra	0	4	0	0	0	0	0	0	0	0	4
Hedrocel Implex	0	0	0	0	0	0	0	1	0	2	3
Endurance	2	0	0	0	0	0	0	0	0	0	2
AGB	0	2	0	0	0	0	0	0	0	0	2
McMinn	1	0	0	0	0	0	0	0	0	0	1
Link-Lidgren-Lund	1	0	0	0	0	0	0	0	0	0	1
Total	1327	1703	159	444	172	460	165	562	130	535	5657

Acetabular components in primary surgery



Acetabular components in revision

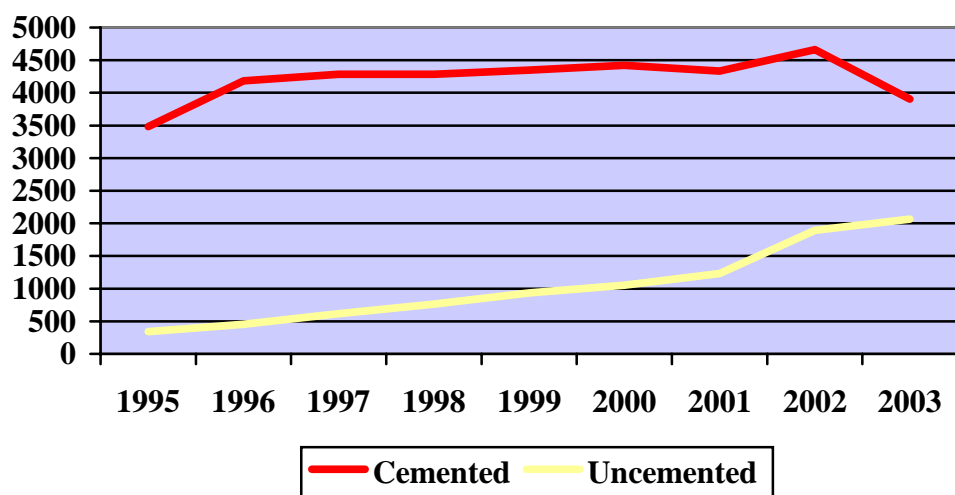


Femoral components in primary surgery (cemented and uncemented)

Component	1995-99		2000		2001		2002		2003		I alt
	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	
Bi-metric	5478	1872	1428	753	1297	811	1176	1155	1199	1379	16548
Exeter	5236	0	1036	0	1055	0	1170	0	1210	0	9707
Lubinus SP II	3594	0	783	0	755	0	838	0	692	0	6662
CPT	1615	0	600	0	688	0	752	0	501	0	4156
Charnley	1812	0	296	0	250	0	245	0	17	0	2620
Taperloc	1549	80	174	0	210	0	186	0	7	0	2206
Bicontact	7	43	10	86	5	160	10	236	6	292	855
Elite Plus	779	0	17	0	1	0	0	0	0	0	797
AML	2	309	0	58	0	57	1	77	0	52	556
C-stem	0	0	0	0	3	0	189	0	149	0	341
S-ROM	0	94	0	52	3	54	1	74	0	35	313
Profile	1	248	1	16	0	9	0	0	0	0	275
ITH	274	0	0	0	0	0	0	0	0	0	274
Biomet Integral	25	0	49	0	49	0	52	0	94	2	271
Versys	0	33	0	13	2	21	1	25	2	91	188
Corail	0	0	0	14	6	11	1	56	1	87	176
Protasul Spotorno	15	49	0	12	0	41	1	40	0	5	163
Link Rippe	1	101	0	20	0	19	0	7	0	2	150
Müller	115	0	1	0	0	0	0	0	0	0	116
PCA	1	110	0	0	0	0	0	0	0	0	111
Rx90	13	0	10	0	8	0	11	1	13	2	58
Spectron	14	0	1	0	1	0	24	0	15	0	55
ZMR	0	0	0	1	0	5	0	17	0	25	48
Logic	0	0	0	0	0	13	0	13	0	14	40
Other	7	4	1	3	3	1	3	1	6	7	36
P.F.C.	19	0	13	0	0	0	0	0	0	0	32
Ranawat-Burstein	2	26	0	0	0	0	0	0	0	0	28
Thrustplate	0	21	0	1	0	1	0	0	0	5	28
Solution	0	12	0	6	0	5	0	2	0	3	28
Kent	0	13	1	2	0	6	2	2	0	1	27
CDH Paavilainen	2	14	3	1	0	2	0	2	0	0	24
Scan HIP	19	0	0	0	0	0	0	0	0	0	19
Omnifit	0	11	0	2	0	2	0	0	0	0	15
Küsswetter	0	14	0	0	0	0	0	0	0	0	14
Anca-Fit	0	0	0	0	0	2	0	5	0	7	14
Profemur R	0	0	0	0	0	0	0	5	0	3	8
Restoration	0	0	0	0	0	1	0	2	0	4	7
Link MP	1	1	0	0	0	0	1	1	1	1	6
HNR	2	3	1	0	0	0	0	0	0	0	6
Mallory CDH	2	3	0	0	0	0	0	0	0	0	5
ABG	4	1	0	0	0	0	0	0	0	0	5

Kotz	0	1	0	1	0	0	0	0	0	0	2
Mallory-Head	0	0	0	0	0	0	0	0	1	0	1
PSO	0	1	0	0	0	0	0	0	0	0	1
SHP	0	0	0	0	1	0	0	0	0	0	1
Integrale	0	0	0	0	0	0	1	0	0	0	1
Total	20586	3067	4424	1042	4337	1221	4662	1724	3906	2025	46994

Femoral components in primary surgery

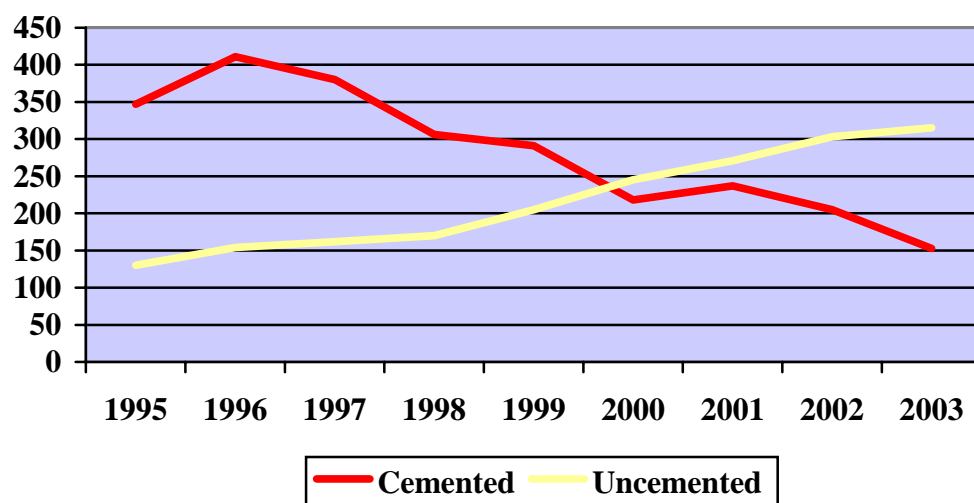


Femoral components in revision (cemented and uncemented)

Component	1995-99		2000		2001		2002		2003		I alt
	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	Cem.	Uncem.	
Bi-metric	454	410	39	94	31	70	26	64	24	59	1271
Exeter	685	0	79	0	107	0	98	0	63	0	1032
S-ROM	1	166	1	95	0	88	0	56	0	34	441
Lubinus SP II	195	0	28	0	25	0	31	0	27	0	306
CPT	117	0	40	0	36	0	24	0	18	0	235
ZMR	0	0	0	5	0	39	0	90	0	84	218
Solution	0	128	0	19	0	20	0	10	0	21	198
Kent	2	80	0	17	0	10	0	13	0	9	131
Charnley	103	0	9	0	13	0	4	0	0	0	129
Taperloc	83	5	1	1	1	0	7	1	1	0	100
Profemur R	0	0	0	0	0	15	0	23	0	28	66
Restoration	0	0	0	4	0	11	0	18	0	31	64
Link MP	0	21	0	5	0	4	0	15	0	15	60
Rx90	14	0	10	1	16	1	4	2	8	0	56
Elite Plus	46	0	0	0	0	0	0	0	0	0	46
Spectron	2	0	11	0	9	0	10	0	8	0	40
Other	5	1	0	2	0	1	1	2	2	13	27
Müller	21	0	0	0	0	0	0	0	0	0	21
AML	0	14	0	1	0	1	0	1	0	0	17
Reach	0	0	0	0	0	0	0	1	0	13	14
MP reconstruction prosthesis	0	1	0	0	0	7	0	1	0	0	9
ITH	7	0	0	0	0	0	0	0	0	0	7
Sentry	0	6	0	0	0	0	0	0	0	0	6
Bicontact	0	0	0	1	0	1	0	3	0	1	6
Protasul Spotorno	2	1	0	0	0	0	0	0	0	0	3
Profile	0	1	0	0	0	1	0	0	0	0	2
Link Rippe	0	2	0	0	0	0	0	0	0	0	2
Kotz	0	2	0	0	0	0	0	0	0	0	2
Logic	0	0	0	0	0	1	0	0	0	1	2
Mallory-Head	0	0	0	0	0	0	0	0	0	2	2
C-stem	0	0	0	0	0	0	1	0	1	0	2
Mallory CDH	0	1	0	0	0	0	0	1	0	0	2
Biomet Integral	1	0	0	0	0	0	0	0	1	0	2
Corail	0	0	0	0	0	0	0	1	0	1	2
Versys	0	0	0	0	0	0	0	0	0	1	1

Ranawat-Burstein	0	1	0	0	0	0	0	0	0	0	1
PSO	0	0	0	0	0	0	0	0	0	1	1
Integrale	0	0	0	0	0	0	0	0	0	1	1
PCA	0	1	0	0	0	0	0	0	0	0	1
Total	1735	844	218	245	237	271	205	303	153	315	4526

Femoral components in revision



The 15 most frequent combinations of components in cemented primary hip arthroplasty

1995-2003

Acetabular component	Femoral component	n
Lubinus	Lubinus SP II	5840
Exeter	Exeter	5825
ZCA	CPT	2714
Müller	Bi-metric	2549
Charnley	Charnley	2533
Charnley	Elite Plus	685
Ultima	Exeter	642
Müller	Taperloc	632
SHP	Bi-metric	507
Contemporary	Exeter	386
Charnley	C-stem	340
Charnley	Bimetric	275
ZCA	Exeter	242
Lubinus	Bimetric	240
Richard's modular	ITH	199

The 15 most frequent combinations of components in hybrid primary hip arthroplasty

1995-2003

Acetabular component	Femoral component	n
Trilogy	Bi-metric	2959
Universal	Bi-metric	2267
Mallory-Head	Exeter	1183
Trilogy	CPT	995
Duraloc	Exeter	918
Trilogy	Taperloc	917
Ranawat-Burstein	Bimetric	604
Trilogy	Lubinus SP II	480
Mallory-Head	Bi-metric	446
Harris-Galante	Bimetric	415
Universal	Taperloc	315
Universal	Biomet Integral	255
Mallory-Head	Lubinus SP II	104
Harris-Galante	Lubinus SP II	102

The 15 most frequent combinations of components in uncemented primary hip arthroplasty

1995-2003

Acetabular component	Femoral component	n
Trilogy	Bimetric	3303
Mallory-Head	Bimetric	1071
Ranawat-Burstein	Bimetric	708
Plasmacup SC	Bicontact	596
Universal	Bimetric	420
Duraloc	AML	317
Harris-Galante	Bimetric	255
Saturne	Bicontact	200
Trilogy	AML	168
Trilogy	Versys	159
Duraloc	Profile	149
Trilogy	Protasul Spotorno	137
Reflection	Bimetric	128
PCA	PCA	108
Trilogy	AML	68

The 5 most frequent combinations of components in cemented revision hip arthroplasty*)

1995-2003

Acetabular component	Femoral component	n
Exeter	Exeter	408
Lubinus	Lubinus SP II	188
Müller	Bi-metric	180
Charnley	Charnley	82
ZCA	CPT	55

*) Includes only revisions where both components have been replaced.

The 5 most frequent combinations of components in hybrid revision hip arthroplasty*)

1995-2003

Acetabular component	Femoral component	n
Mallory-Head	Exeter	156
Trilogy	CPT	88
Ranawat-Burstein	Bi-metric	75
Universal	Bi-metric	66
Trilogy	Exeter	64

*) Includes only revisions where both components have been replaced.

The 5 most frequent combinations of components in uncemented revision hip arthroplasty*)

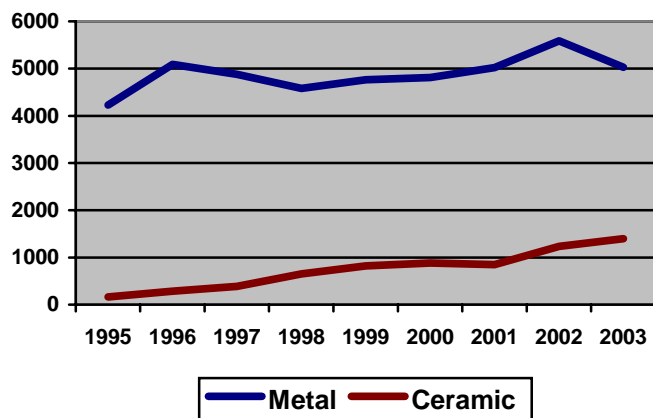
1995-2003

Acetabular component	Femoral component	n
Trilogy	Bi-metric	177
Ranawat-Burstein	Bi-metric	169
Trilogy	S-ROM	164
Duraloc	Solution	70
Trilogy	ZMR	62

*) Includes only revisions where both components have been replaced.

Material of modular femoral head

Material of femoral head	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Metal	23545	90.9	4814	84.5	5025	85.5	5583	81.8	5027	78.2	43994	86.7
Ceramic	2309	8.9	880	15.5	847	14.4	1238	18.1	1399	21.8	6673	13.2
Not replaced	45	0.2	2	0.0	2	0.0	1	0.0	0	0.0	50	0.1
Other	2	0.0	1	0.0	5	0.1	3	0.0	3	0.1	14	0.0
Total	25901	100.0	5697	100.0	5879	100.0	6825	100.0	6429	100.0	50731	100.0



Diameter of femoral head in primary surgery (modular head)*)

Diameter of femoral head	1997-2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%
22	363	1.9	52	1.0	207	3.4	197	3.4	819	2.3
24	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
25	3	0.0	2	0.0	1	0.0	1	0.0	7	0.0
26	26	0.1	0	0.0	4	0.1	3	0.1	33	0.1
28	17607	92.6	4984	95.6	5828	95.1	5397	94.1	33816	93.7
29	0	0.0	1	0.0	1	0.0	0	0.0	2	0.0
30	972	5.1	169	3.2	82	1.3	68	1.2	1291	3.6
32	53	0.3	8	0.2	6	0.1	67	1.2	134	0.4
Total	19025	100.0	5216	100.0	6129	100.0	5733	100.0	36103	100.0

Diameter of femoral head in revision (modular head)*)

Diameter of femoral head	1997-2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%
22	53	1.9	14	2.1	14	2.0	6	0.9	87	1.8
25	5	0.2	1	0.2	1	0.1	0	0.0	7	0.1
26	10	0.4	1	0.2	0	0.0	1	0.1	12	0.3
28	2472	88.4	595	89.7	617	88.7	626	89.9	4310	88.9
29	5	0.2	0	0.0	0	0.0	0	0.0	5	0.1
30	84	3.0	21	3.2	15	2.1	4	0.6	124	2.6
32	166	5.9	31	4.7	49	7.0	59	8.5	305	6.3
Total	2795	100.0	663	100.0	696	100.0	696	100.0	4850	100.0

*) Registered as from 1997

Intraoperative acetabular complications in primary surgery

Complications	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	23230	98.1	5367	98.1	5460	98.1	6431	98.4	5877	98.6	46365	98.2
Yes	458	1.9	106	1.9	106	1.9	106	1.6	82	1.4	858	1.8
Total	23688	100.0	5473	100.0	5566	100.0	6537	100.0	5959	100.0	47223	100.0

Intraoperative acetabular complications in revision

Complications	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	3043	97.4	748	98.0	807	97.9	918	99.0	877	98.7	6393	97.9
Yes	82	2.6	15	2.0	17	2.1	9	1.0	12	1.4	135	2.1
Total	3125	47.9	763	11.7	824	12.6	927	14.2	889	13.6	6528	100.0

Intraoperative femoral complications in primary surgery

Complications	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
None	23081	97.6	5313	97.2	5413	97.4	6350	98.1	5789	97.6	45946	97.6
Fissure/fracture; - osteosynt./-relief	200	0.9	43	0.8	47	0.9	35	0.5	45	0.8	370	0.8
Fissure/fracture; - osteosynt./+ relief	23	0.1	4	0.1	5	0.1	3	0.1	11	0.2	46	0.1
Fissure/fracture; + osteosynt./- relief	123	0.5	38	0.7	36	0.7	38	0.6	43	0.7	278	0.6
Fissure/fracture; + osteosynt./+ relief	74	0.3	27	0.5	20	0.4	18	0.3	16	0.3	155	0.3
Other	148	0.6	40	0.7	36	0.7	32	0.5	26	0.4	282	0.6
Total	23649	100.0	5465	100.0	5557	100.0	6476	100.0	5930	100.0	47077	100.0

Intraoperative femoral complications in revision

Complications	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
None	2225	80.1	585	86.0	639	86.1	643	84.5	691	88.4	4783	83.3
Fissure/fracture; - osteosynt./-relief	119	4.3	21	3.1	19	2.6	15	2.0	12	1.5	186	3.2
Fissure/fracture; - osteosynt./+ relief	36	1.3	5	0.7	4	0.5	4	0.5	13	1.7	62	1.1
Fissure/fracture; + osteosynt./- relief	169	6.1	15	2.2	32	4.3	37	4.9	31	4.0	284	5.0
Fissure/fracture; + osteosynt./+ relief	162	5.8	37	5.4	36	4.9	40	5.3	24	3.1	299	5.2
Other	67	2.4	17	2.5	12	1.6	22	2.9	11	1.4	129	2.3
Total	2778	100.0	680	100.0	742	100.0	761	100.0	782	100.0	5743	100.0

Acetabular bone grafting in primary surgery

Bone grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	18876	79.7	4094	74.8	4058	72.9	4837	74.0	4320	72.5	36185	76.6
Yes	4812	20.3	1379	25.2	1508	27.1	1698	26.0	1640	27.5	11037	23.4
Total	23688	100.0	5473	100.0	5566	100.0	6535	100.0	5960	100.0	47222	100.0

Grafting material	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cancellous bone	4103	85.9	1219	89.0	1368	91.3	1557	91.9	1515	92.6	9762	88.9
Massive grafting	538	11.3	116	8.5	113	7.5	120	7.1	109	6.7	996	9.1
Structural grafting	136	2.9	35	2.6	17	1.1	18	1.1	13	0.8	219	2.0

Type of grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Autologous	4601	95.7	1350	97.9	1466	97.2	1653	97.4	1601	97.9	10671	96.7
Heterologous	184	3.8	25	1.8	41	2.7	41	2.4	33	2.0	324	2.9
Combination	19	0.4	2	0.2	1	0.1	4	0.2	2	0.1	28	0.3
Other	6	0.1	2	0.2	0	0.0	0	0.0	0	0.0	8	0.1
Total	4810	100.0	1379	100.0	1508	100.0	1698	100.0	1636	100.0	11031	100.0

Acetabular bone grafting in revision

Bone grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	1163	38.4	181	30.0	184	29.1	213	29.3	219	32.9	1960	34.7
Yes	1865	61.6	422	70.0	448	70.9	514	70.7	446	67.1	3695	65.3
Total	3028	100.0	603	100.0	632	100.0	727	100.0	665	100.0	5655	100.0

Grafting material	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cancellous bone	627	34.8	137	32.9	142	32.2	169	33.1	158	35.9	1233	34.2
Massive grafting	1090	60.5	270	64.9	289	65.5	330	64.6	277	63.0	2256	62.5
Structural grafting	85	4.7	9	2.2	10	2.3	12	2.4	5	1.1	121	3.4

Type of grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Autologous	446	23.9	121	28.7	112	25.0	144	28.0	122	27.4	945	25.6
Heterologous	1362	73.1	296	70.1	323	72.1	362	70.4	310	69.7	2653	71.8
Combination	52	2.8	5	1.2	11	2.5	8	1.6	8	1.8	84	2.3
Other	4	0.2	0	0.0	2	0.5	0	0.0	5	1.1	11	0.3
Total	1864	100.0	422	100.0	448	100.0	514	100.0	445	100.0	3693	100.0

Femoral bone grafting in primary surgery

Bone grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	23328	98.6	5383	98.5	5479	98.6	6307	99.0	5884	99.3	46381	98.7
Yes	323	1.4	82	1.5	78	1.4	67	1.1	44	0.7	594	1.3
Total	23651	100.0	5465	100.0	5557	100.0	6374	100.0	5928	100.0	46975	100.0

Grafting material	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cancellous bone	245	76.3	63	77.8	61	78.2	52	77.6	38	86.4	459	77.7
Massive grafting	65	20.3	17	21.0	14	18.0	14	20.9	6	13.6	116	19.6
Structural grafting	11	3.4	1	1.2	3	3.9	1	1.5	0	0.0	16	2.7

Type of bone grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Autologous	277	85.8	66	80.5	66	84.6	56	83.6	41	93.2	506	85.2
Heterologous	43	13.3	15	18.3	12	15.4	9	13.4	2	4.6	81	13.6
Combination	2	0.6	1	1.2	0	0.0	1	1.5	1	2.3	5	0.8
Other	1	0.3	0	0.0	0	0.0	1	1.5	0	0.0	2	0.3
Total	323	100.0	82	100.0	78	100.0	67	100.0	44	100.0	594	100.0

Femoral bone grafting in revision

Transplantation	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
No	1266	49.1	222	48.0	267	52.6	298	58.7	265	56.6	2318	51.2
Yes	1312	50.9	241	52.1	241	47.4	210	41.3	203	43.4	2207	48.8
Total	2578	100.0	463	100.0	508	100.0	508	100.0	468	100.0	4525	100.0

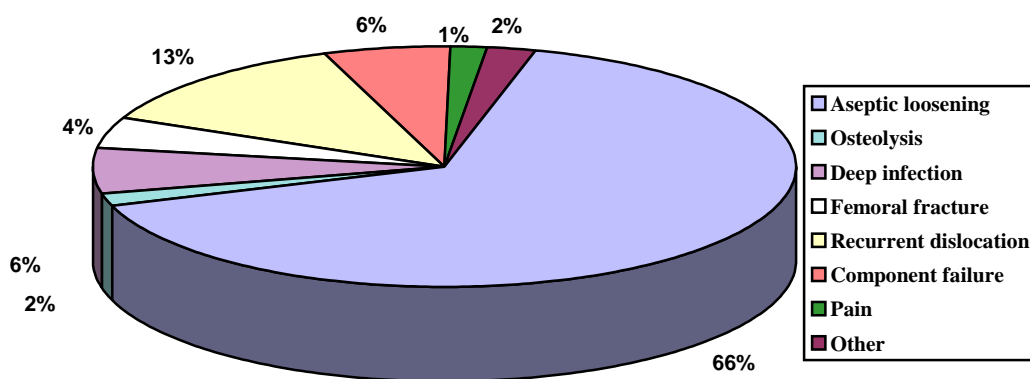
Grafting material	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cancellous bone	142	10.9	38	16.0	43	17.8	50	23.8	56	27.7	329	15.0
Massive grafting	1152	88.1	195	82.3	192	79.7	158	75.2	144	71.3	1841	83.8
Structural grafting	14	1.1	4	1.7	6	2.5	2	1.0	2	1.0	28	1.3

Type of grafting	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Autologous	109	8.3	27	11.2	19	7.9	22	10.5	24	11.8	201	9.1
Heterologous	1168	89.1	207	85.9	218	90.5	184	87.6	167	82.3	1944	88.1
Combination	32	2.4	6	2.5	3	1.2	1	0.5	10	4.9	52	2.4
Other	2	0.2	1	0.4	1	0.4	3	1.4	2	1.0	9	0.4
Total	1311	100.0	241	100.0	241	100.0	210	100.0	203	100.0	2206	100.0

Indication for revision – 1st revision*)

Indication for revision	1995-1998		1999		2000		2001		2002		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Aseptic loosening of femoral and acetabular component			184		169		178		152			
Aseptic loosening of femoral component alone			92		86		104		86			
Aseptic loosening of acetabular component alone			135		167		214		189			
Aseptic loosening (all)	2118	66.9	411	63.6	422	62.1	496	66.5	427	60.2	3874	65.9
Osteolysis/granuloma without loosening	50	1.6	15	2.3	14	2.1	10	1.3	12	1.7	101	1.7
Deep infection	194	6.1	45	7.0	52	7.7	29	3.9	51	7.2	371	6.2
Femoral fracture	114	3.6	22	3.4	41	6.0	37	5.0	34	4.8	248	4.2
Dislocation	354	11.2	99	15.3	91	13.4	111	14.9	116	16.4	771	13.0
Component failure	203	6.4	29	4.5	45	6.6	36	4.8	38	5.4	351	5.9
Pain	51	1.6	7	1.1	4	0.6	12	1.6	16	2.3	90	1.5
Other	80	2.5	18	2.8	11	1.6	15	2.0	15	2.1	139	2.3
Total	3164	100.0	646	100.0	680	100.0	746	100.0	709	100.0	5945	100.0

*) Different types of aseptic loosening not reported prior to 1997.

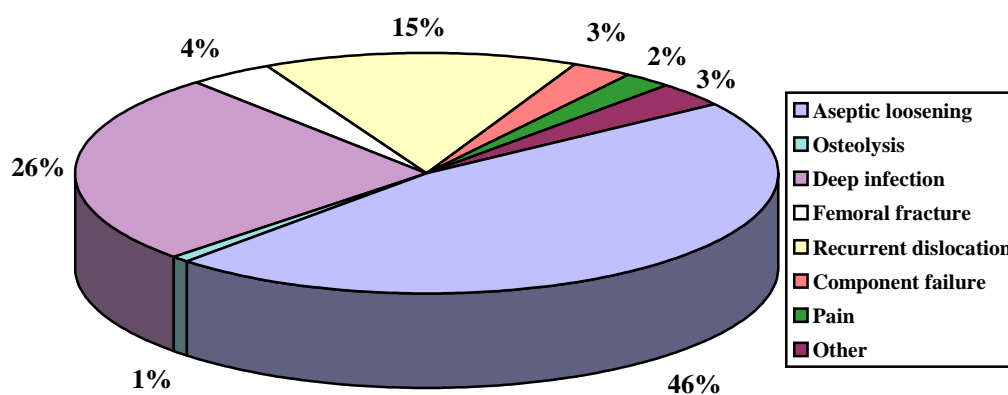


Indication for revision – 2nd or later revisions*)**)

Indication for revision	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Aseptic loosening of femoral and acetabular component			29		43		42		37			
Aseptic loosening of femoral component alone			30		49		48		32			
Aseptic loosening of acetabular component alone			43		42		58		57			
Aseptic loosening (all)	581	50.0	102	39.5	134	46.2	148	46.4	126	40.1	1091	46.5
Osteolysis/granuloma without loosening	10	0.9	2	0.8	5	1.7	2	0.6	5	1.6	24	1.0
Deep infection	280	24.1	84	32.6	74	25.5	76	23.8	88	28.0	602	25.7
Femoral fracture	44	3.8	9	3.5	11	3.8	14	4.4	14	4.5	92	3.9
Dislocation	164	14.1	34	13.2	43	14.8	50	15.7	49	15.6	340	14.5
Component failure	30	2.6	4	1.6	7	2.4	12	3.8	11	3.5	64	2.7
Pain	25	2.2	7	2.7	2	0.7	7	2.2	13	4.1	54	2.3
Other	29	2.5	16	6.2	14	4.8	10	3.1	8	2.6	77	3.3
Total	1163	100.0	258	100.0	290	100.0	319	100.0	314	100.0	2344	100.0

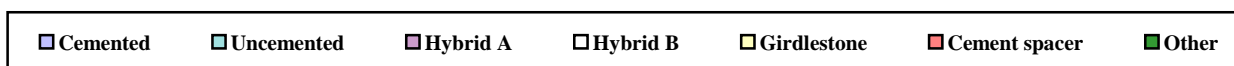
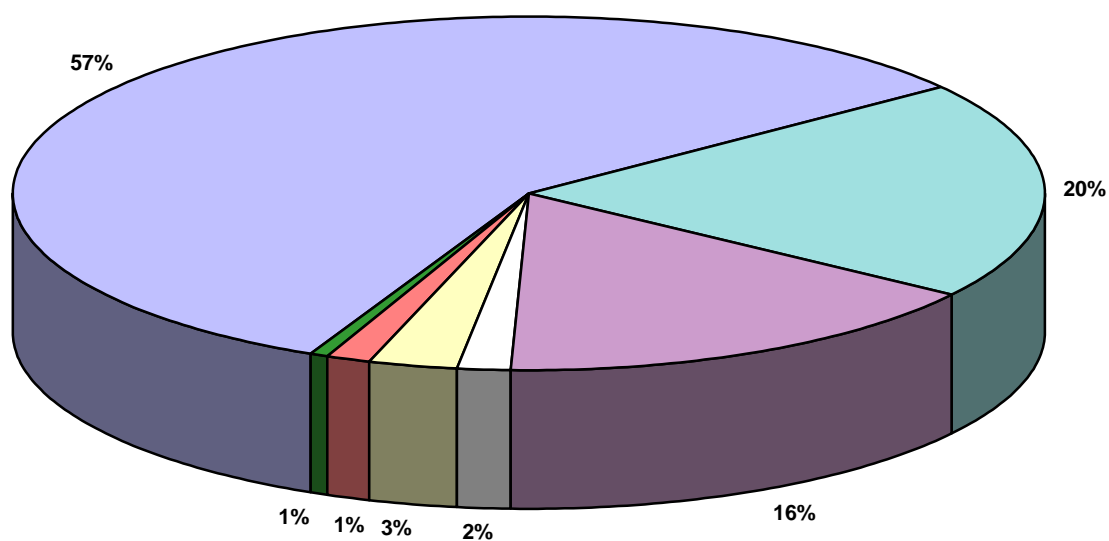
*) Different types of aseptic loosening not reported prior to 1997.

**) Excluded are implantations of prostheses following previous Girdlestone surgery.



Prosthesis prior to revision

Prosthesis prior to revision	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Cemented	2675	61.8	493	54.5	532	54.9	560	52.6	519	50.7	4779	57.7
Uncemented	794	18.4	201	22.2	189	19.5	245	23.0	237	23.2	1666	20.1
Hybrid A (cem. femur)	570	13.2	146	16.2	191	19.7	200	18.8	199	19.5	1306	15.8
Hybrid B (cem. acetab.)	76	1.8	20	2.2	17	1.8	20	1.9	19	1.9	153	1.8
Girdlestone status	121	2.8	27	3.0	29	3.0	23	2.2	31	3.0	231	2.8
Cement spacer	61	1.4	14	1.6	10	1.0	11	1.0	15	1.5	111	1.3
Other	30	0.7	3	0.3	2	0.2	6	0.60	3	0.3	44	0.5
Total	4327	100.0	904	100.0	970	100.0	1065	100.0	1023	100.0	8289	100.0



Extent of revision

Extent of revision	1995-1999		2000		2001		2002		2003		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Total replacement	1723	39.8	287	31.8	301	31.0	316	29.8	275	26.9	2902	35.0
Component parts replaced	2277	52.6	512	56.6	565	58.3	671	63.2	631	61.7	4656	56.2
Prosthesis removed	238	5.5	65	7.2	61	6.3	52	4.9	74	7.2	490	5.9
Prosthesis after Girdlestone	88	2.0	40	4.4	43	4.4	22	2.1	43	4.2	236	2.9
Total	4326	100.0	904	100.0	970	100.0	1061	100.0	1023	100.0	8284	100.0

Partial exchange

Exchanged component	1995-1999 (n=2277)	2000 (n=512)	2001 (n=565)	2002 (n=671)	2003 (n=631)	Total (n=4656)
Acetabular component	1204	276	288	385	347	2500
Acetabulum liner	849	367	414	532	495	2657
Femoral component	765	135	164	169	150	1383
Head	1158	291	334	365	387	2535

Number of previous revisions

Number of previous revisions	1995-1999	2000	2001	2002	2003	Total
	n	n	n	n	n	n
0	3164	646	680	746	708	5944
1	766	164	194	201	201	1526
2	220	54	70	78	66	488
3	95	20	12	20	26	173
4	52	11	9	10	11	93
5	17	4	3	5	4	33
>5	13	5	2	5	6	31
Total	4327	904	970	1065	1022	8288

Classification of bone loss upon revision of acetabular component (registered as from 2003)

No. previous revisions	2003 n
Type I	197
Type II	214
Type III	98
Type IV	21
Type V	4
Not classified	88
Total	622

Classification of bone loss upon revision of femoral component (registered as from 2003)

No. previous revisions	2003
	n
Type I	131
Type II	142
Type III	50
Type IV	13
Type V	5
Type VI	13
Not classified	71
Total	425

Preoperative Harris Score in relation to type of surgery

	Primary surgery (n=33658)	Revision (n=4995)
Mean value	43.6	45.7
Standard deviation	15.1	21.0

Postoperative Harris Score in relation to type of surgery*)

	Primary surgery (n=22612)	Revision (n=4050)
Mean value	88.6	82.7
Standard deviation	12.3	14.9

*) Latest out-patient control at follow-up >6 months

Preoperative Harris Score in relation to gender

	Women (n=22612)		Men (n=16736)	
	Primary	Revision	Primary	Revision
Mean value	42.0	44.4	45.8	47.1
Standard deviation	15.3	20.5	14.6	21.5

Postoperative Harris Score in relation to gender*)

	Women (n=14705)		Men (n=11957)	
	Primary	Revision	Primary	Revision
Mean value	86.7	80.2	90.9	85.3
Standard deviation	13.1	15.4	10.7	14.0

*) Latest out-patient control at follow-up >6 months

Patient's own assessment*)

Patient satisfaction	Primary surgery		Revision	
	n	%	n	%
Most satisfactory	21538	73.8	3103	60.7
Satisfactory	5933	20.3	1404	27.5
Not quite satisfactory	1443	5.0	492	9.6
Unsatisfactory	262	0.9	112	2.2
Total	29176	100.0	5111	100.0

*) Latest out-patient control at follow-up >6 months

Pain score*)

Pain	Primary surgery		Revision	
	n	%	n	%
None	18211	71.6	2588	57.8
Light	4888	19.2	1068	23.8
Mild	1321	5.2	435	9.7
Moderate	809	3.2	301	6.7
Severe	197	0.8	82	1.8
Incapacitating	20	0.1	7	0.2
Total	25446	100.0	4481	100.0

*) Latest out-patient control at follow-up >6 months

Leg length discrepancy*)

Discrepancy in leg length	Primary surgery		Revision	
	n	%	n	%
< 1 cm	21671	86.3	3411	77.8
1-2 cm	2975	11.9	747	17.0
2-3 cm	363	1.5	167	3.8
> 3 cm	102	0.4	58	1.3
Total	25111	100.0	4383	100.0

*) Latest out-patient control at follow-up >6 months

Implant survival in prosthesis combinations 1995-2003

Cemented hip arthroplasty

All combinations

Endpoint: first revision

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Charnley Ogee - Bi-metric u/kraive	1995-2003	267	98.7	97.2 - 100	96.7	93.9 - 99.4	92.9	85.3 - 100
Charnley Ogee - C-stem	2001-2003	332						
Charnley Ogee - Charnley Extra Heavy	1995-2003	177	97.3	94.8 - 100	95.7	91.7 - 99.8		
Charnley Ogee - Charnley Flanged	1995-2003	1058	97.9	97.1 - 98.8	96.8	95.6 - 98.0	94.3	92.4 - 96.2
Charnley Ogee - Charnley Heavy	1997-2003	253	96.6	94.0 - 99.1	95.6	92.5 - 98.8		
Charnley Ogee - Charnley Round-back	1995-2003	601	98.4	97.3 - 99.4	97.0	95.2 - 98.7	95.9	93.7 - 98.2
Charnley Ogee - Elite Plus	1995-2001	320	96.8	94.8 - 98.8	96.8	94.8 - 98.8	93.2	89.9 - 96.5
Charnley Standard - Charnley Flanged	1995-2002	134	100		98.6	95.9 - 100	98.6	95.9 - 100
Charnley Standard - Charnley Round-back	1995-2001	109	98.1	95.5 - 100	96.9	93.5 - 100	95.5	91.2 - 99.9
Charnley Standard - Elite Plus	1995-1998	346	96.8	94.9 - 98.8	96.1	94.0 - 98.3	93.2	89.7 - 96.6
Contemporary - Exeter	2001-2003	386						
Exeter All Plast - Exeter	1995-2003	4412	97.2	96.7 - 97.7	96.2	95.6 - 96.8	94.5	93.6 - 95.4
Exeter Duration - Exeter	1998-2003	1406	97.4	96.5 - 98.5	96.9	95.6 - 98.2		
Lubinus - Bimetric	1998-2003	234	93.8	90.0 - 97.7	93.8	90.0 - 97.7		
Lubinus - Lubinus SP II	1995-2003	5835	98.0	97.6 - 98.3	97.5	97.0 - 98.0	96.3	95.6 - 97.0
Mallory-Head - Exeter	1995-2003	101	95.5	91.2 - 99.8	93.7	88.3 - 99.2	93.7	88.3 - 99.2
Müller - Bimetric	1995-2003	2489	96.8	96.1 - 97.5	94.7	93.6 - 95.7	92.4	90.8 - 94.0
Müller - Taperloc	1995-2001	441	96.6	94.9 - 98.4	94.2	91.8 - 96.7	90.4	85.5 - 95.3
Müller Hi Wall - Taperloc	1995-1997	191	96.7	94.1 - 99.3	94.8	91.4 - 98.1	93.8	90.0 - 97.6
Richards modular - ITH	1995-1998	199	98.4	96.6 - 100	97.8	95.8 - 99.9	91.4	87.0 - 95.7
SHP - Bimetric	1999-2003	358	96.9	95.0 - 98.8				
SHP - Bi-metric u/kraive chrom/cobolt	2002-2003	145						
Ultima Augmented - Exeter	1997-2003	642	96.6	95.0 - 98.1	95.4	93.4 - 97.4		
ZCA - CPT	1995-2003	2712	98.2	97.6 - 98.7	97.6	96.9 - 98.3	95.7	93.4 - 98.0
ZCA - Exeter	1998-2003	242	99.6	98.7 - 100	99.6	98.7 - 100		

Cemented hip arthroplasty
Primary arthrosis
End point: Aseptic loosening

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Charnley Ogee - Bimetric	1995-2003	238	99.3	99.2 - 99.4	98.5	98.3 - 98.8	97.3	96.9 - 97.7
Charnley Ogee - C-stem	2001-2003	285						
Charnley Ogee - Charnley Extra Heavy	1995-2003	153	99.1	97.3 - 100	97.2	93.2 - 100		
Charnley Ogee - Charnley Flanged	1995-2003	872	98.8	98.0 - 99.5	98.0	97.0 - 99.0	95.4	93.3 - 97.4
Charnley Ogee - Charnley Heavy	1997-2003	222	98.2	96.1 - 100	97.0	94.0 - 100		
Charnley Ogee - Charnley Round-back	1995-2003	448	99.2	98.3 - 100	98.2	96.6 - 99.9	98.2	96.6 - 99.9
Charnley Ogee - Elite Plus	1995-2001	239	99.6	98.7 - 100	99.6	98.7 - 100	99.6	98.7 - 100
Charnley Standard - Elite Plus	1995-1998	240	99.1	97.8 - 100	98.6	97.0 - 100	96.6	93.3 - 100
Contemporary - Exeter	1997-2003	270	100		100			
Exeter All Plast - Exeter	1995-2003	3545	99.1	98.8 - 99.4	98.6	98.2 - 99.0	97.2	96.4 - 98.0
Exeter Duration - Exeter	1998-2003	1182	99.7	99.3 - 100				
Lubinus - Bimetric	1998-2003	183	95.3	91.2 - 99.4	95.3	91.2 - 99.4		
Lubinus - Lubinus SP II	1995-2003	4528	99.6	99.4 - 99.8	99.4	99.1 - 99.6	99.1	98.6 - 99.5
Müller - Bimetric	1995-2003	1805	99.1	98.7 - 99.6	97.0	96.1 - 98.0	95.5	94.0 - 97.0
Müller - Taperloc	1995-2001	359	98.8	97.7 - 100	96.8	94.8 - 98.9	92.5	86.6 - 98.3
Müller Hi Wall - Taperloc	1995-1997	129	97.6	94.9 - 100	95.9	92.3 - 99.4	94.6	90.3 - 98.9
Richards modular - ITH	1995-1998	159	99.3	98.0 - 100	98.6	96.7 - 100	92.2	87.4 - 96.9
SHP - Bimetric	1999-2003	309	100					
SHP - Bi-metric u/krave chrom/cobolt	2002-2003	119						
Ultima Augmented - Exeter	1997-2003	528	99.7	99.1 - 100	98.8	97.5 - 100		
ZCA - CPT	1995-2003	2281	99.8	99.6 - 100	99.7	99.4 - 100	99.1	98.1 - 100
ZCA - Exeter	1998-2003	199	100		100			

Hybrid hip arthroplasty
All combinations
End point: first revision

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Duraloc 300 - Exeter	1995-2003	907	96.9	95.6 – 98.2	96.1	94.4 – 97.8	96.1	94.4 – 97.8
Harris-Galante - Bimetric	1995-2001	413	96.0	94.1 – 97.9	96.0	94.1 – 97.9	95.2	93.0 – 97.4
Harris-Galante II - CPT	1995-1996	125	99.2	97.6 - 100	99.2	97.6 - 100	97.7	94.3 - 100
Mallory-Head - Bimetric	1996-2003	412	95.6	93.2 – 98.0	90.2	85.8 - 94.5		
Mallory-Head - CPT	1998-2003	117	98.0	95.3 - 100	99.0	85.7 - 100		
Mallory-Head - Exeter	1995-2003	1181	97.5	96.5 – 98.5	97.1	95.9 – 98.2	95.6	95.8 – 97.4
Mallory-Head – Lubinus SP II	1996-2002	104	97.0	93.6 - 100	97.0	93.6 - 100		
Ranawat-Burstein - Bimetric	1995-2003	558	94.2	92.1 - 96.4	91.9	89.3 - 94.5	90.7	87.9 - 93.6
Trilogy (high) - Bimetric	1995-2003	2806	96.2	95.4 – 97.0	94.5	93.3 – 95.7	93.1	91.2 – 95.0
Trilogy (high) - CPT	1996-2003	992	97.7	96.7 – 98.7	96.4	94.6 – 98.1		
Trilogy (high) - Exeter	1996-2003	241	98.3	96.7 - 100	98.3	96.7 - 100		
Trilogy (high) - Lubinus SP II	1996-2003	480	94.8	92.7 – 96.9	92.4	89.0 – 95.8		
Trilogy (high) - Taperloc	1995-2003	917	94.1	92.4 – 95.7	90.6	88.3 - 92.8	86.6	83.4 - 89.8
Universal - Bi-metric u/krave chrom/cobolt	2002-2003	120						
Universal - Bimetric	1995-2003	2144	96.4	95.5 – 97.2	93.8	92.5 - 95.1	89.0	85.7 - 92.2
Universal - Biomet Integral	1998-2003	254	98.8	97.5 – 100	98.8	97.5 - 100		
Universal - Taperloc	1995-2002	315	96.6	94.6 – 98.7	92.6	88.6 – 96.6		

Hybrid hip arthroplasty
Primary arthrosis
End point: Aseptic loosening

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Duraloc 300 - Exeter	1995-2003	803	100		99.5	98.5 - 100	99.5	98.5 - 100
Harris-Galante - Bimetric	1995-1999	176	99.4	98.3 - 100	99.4	98.3 - 100	97.4	94.4 - 100
Mallory-Head - Bimetric	1996-2003	330	98.5	96.9 - 100	93.5	89.2 - 97.8		
Mallory-Head - Exeter	1995-2003	875	99.6	99.0 - 100	99.6	99.0 - 100	99.0	97.8 - 100
Ranawat-Burstein - Bimetric	1995-2003	364	97.4	95.7 - 99.2	95.8	93.4 - 98.1	94.3	91.4 - 97.2
Trilogy (high) - Bimetric	1995-2003	2193	99.0	98.5 - 99.5	98.3	97.5 - 99.1	97.2	95.3 - 99.0
Trilogy (high) - CPT	1996-2003	788	99.8	99.3 - 100	98.7	97.2 - 100		
Trilogy (high) - Exeter	1996-2003	186	100		100			
Trilogy (high) - Lubinus SP II	1996-2003	374	100		99.0	97.0 - 100		
Trilogy (high) - Taperloc	1995-2003	721	99.5	98.9 - 100	97.0	95.3 - 98.6	92.5	89.2 - 95.8
Universal - Bimetric	1995-2003	1810	99.2	98.8 - 99.7	97.8	96.9 - 98.8	94.9	92.4 - 97.5
Universal - Bi-metric u/krave chrom/cobolt	2002-2003	104						
Universal - Biomet Integral	1998-2003	218	100		100			
Universal - Taperloc	1995-2002	207	98.9	97.3 - 100	96.3	92.4 - 100		

Uncemented hip arthroplasty
All combinations
End point: first revision

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Duraloc 300 – AML	1995-2002	273	97.8	96.0 - 99.5	97.3	95.4 - 99.3	94.0	89.7 - 98.4
Harris-Galante II – Bimetric	1995-2003	187	97.8	95.7 - 99.9	96.6	94.0 - 99.3	92.2	85.5 – 98.9
Mallory-Head - Bimetric	1995-2003	1006	97.7	96.5 - 99.0	96.9	94.8 - 99.0	88.9	76.9 - 100
Mallory-Head – S-ROM	1997-2003	104	96.9	93.5 - 100	96.9	93.5 - 100		
Plasmacup SC Keramikliner – Bicontact	1999-2003	416	95.8	92.1 - 99.5				
Plasmacup SC Polyethylenliner – Bicontact	1999-2003	180	94.7	91.1 - 98.3				
Ranawat-Burstein - Bimetric	1995-2003	655	97.7	96.4 – 98.9	97.1	95.5 – 98.6	94.6	91.8 - 97.5
Reflection (high) - Bimetric	1998-2003	123	86.3	79.4 - 93.2	86.3	79.4 - 93.2		
Saturne - Bicontact	2000-2003	200	99.0	97.6 - 100				
Trilogy (high) - AML	2000-2003	168	100					
Trilogy (high) - Bimetric	1995-2003	3100	96.6	95.9 - 97.4	95.5	94.4 - 96.5	92.8	89.8 – 95.7
Trilogy (high) - Bi-metric m/kraue chrom/cobolt	2002-2003	100						
Trilogy (high) - Protasul Spotorno	1995-2003	137	97.6	94.9 - 100	97.6	94.9 - 100	97.6	94.9 - 100
Trilogy (high) - Versys	1998-2003	159	98.1	96.0 - 100	95.5	89.9 - 100		
Universal - Bimetric	1995-2003	405	96.2	94.3 - 98.2	95.6	93.4 - 97.9	93.8	89.7 – 98.0

Uncemented hip arthroplasty
Primary arthrosis
End point: Aseptic loosening

Combination	Period	N	3 year	95% CL	5 year	95% CL	8 year	95%CL
Duraloc 300 – AML	1995-2002	198	98.9	97.4 - 100	98.9	97.4 - 100	98.9	97.4 - 100
Mallory-Head - Bimetric	1995-2003	671	100		100		95.5	86.8 - 100
Plasmacup SC Keramikliner – Bicontact	1999-2003	333	97.9	93.7 - 100				
Plasmacup SC Polyethylenliner – Bioconta	1999-2003	160	100					
Ranawat-Burstein - Bimetric	1995-2003	325	100		100		100	
Reflection (high) - Bi-metric u/krave	1998-2003	100	100		100			
Saturne - Bicontact	2000-2003	152	100					
Trilogy (high) - AML	2000-2003	130	100					
Trilogy (high) - Bimetric	1995-2003	2423	99.6	99.3 - 100	99.2	98.5 – 99.8	99.2	98.5 – 99.8
Trilogy (high) - Protasul Spotorno	1995-2003	108	99.0	97.0 - 100	99.0	97.0 - 100	99.0	97.0 - 100
Trilogy (high) - Versys	1998-2003	104	100		100			
Universal - Bimetric	1995-2003	261	99.6	99.3 - 100	99.2	98.5 – 99.8	99.2	98.5 – 99.8

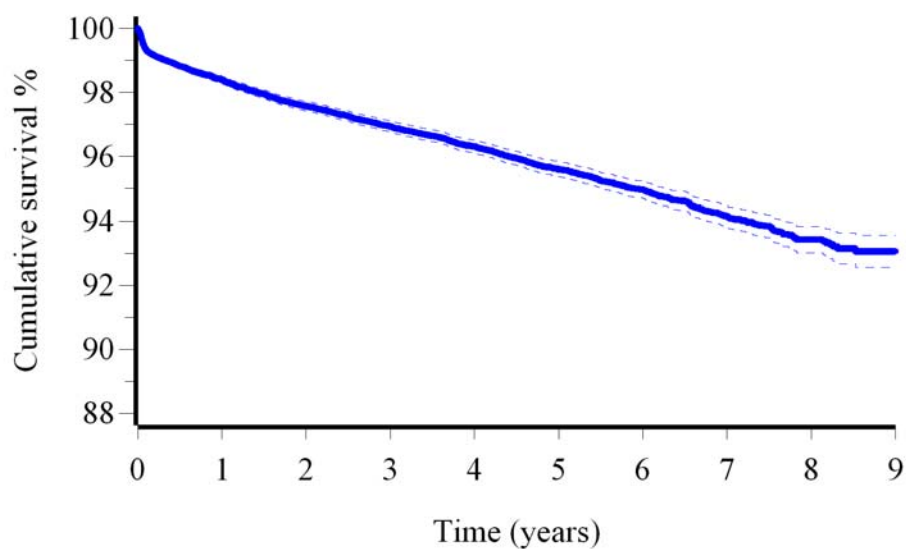
Kaplan-Meier curves in primary hip arthroplasty

All

End-point: 1st revision

Estimated survival with 95% confidence interval

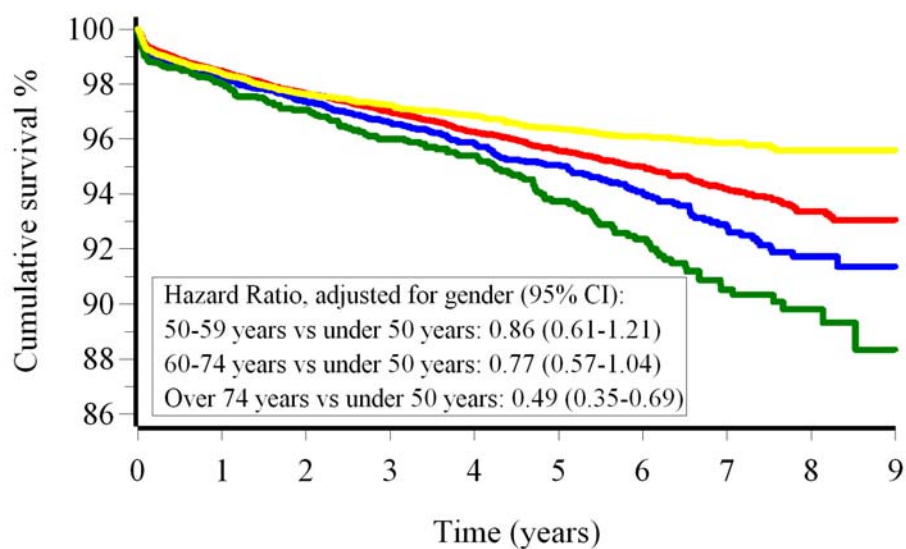
(n= 47115)



All, classified by age

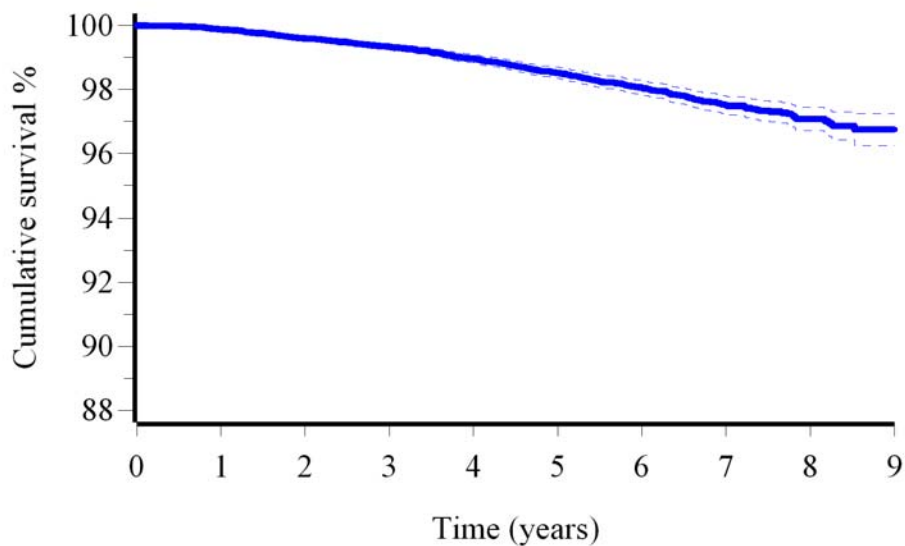
End-point: 1st revision

(n= 47115)

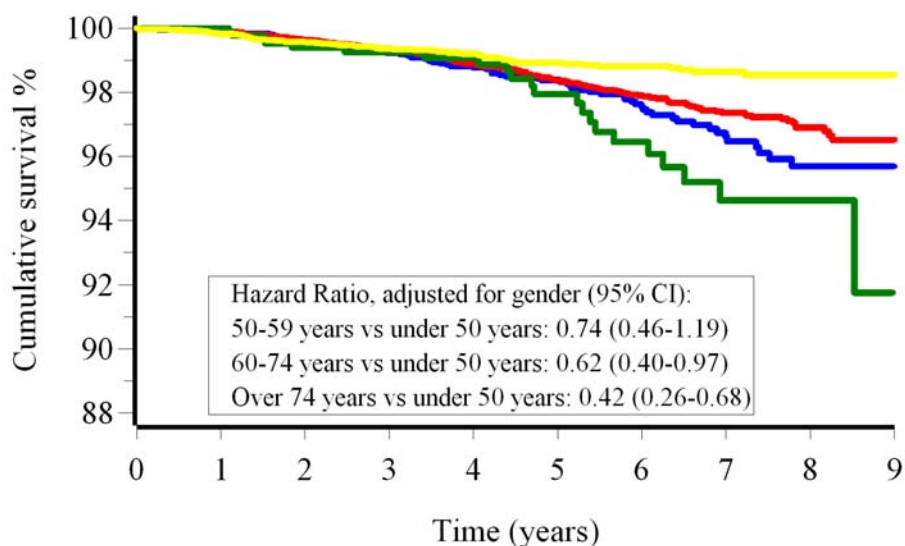


Age — 50-59 years (n=6929) — 60-74 years (n=22387)
— < 50 years (n=2895) — >= 75 years (n=14904)

All, basic disease: primary arthrosis
 End-point: Reason for 1st revision is aseptic loosening
 Estimated survival with 95% confidence interval
 (n= 36255)

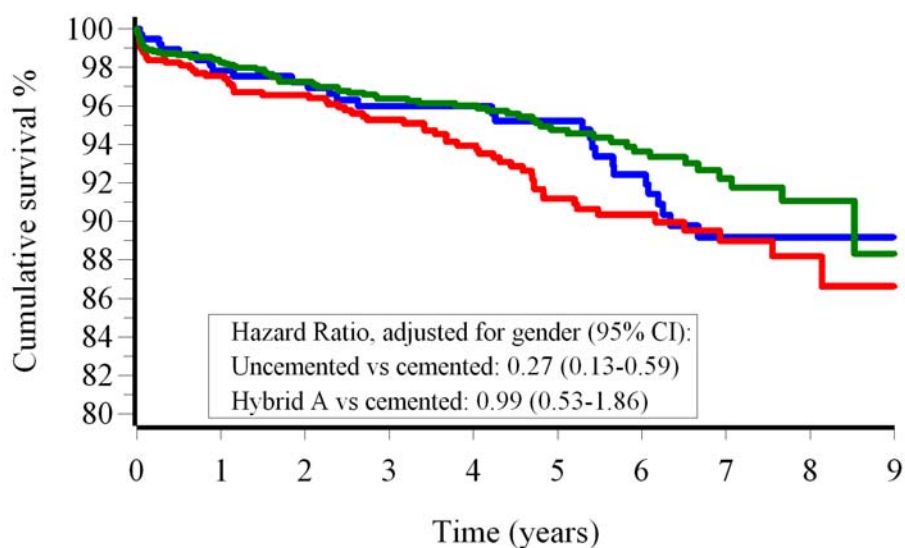


Basic disease: primary arthrosis
 End-point: Reason for 1st revision is aseptic loosening
 (n= 36255)



Alder — 50-59 years (n=5115) — 60-74 years (n=18659)
 — < 50 years (n=1066) — >= 75 years (n=11415)

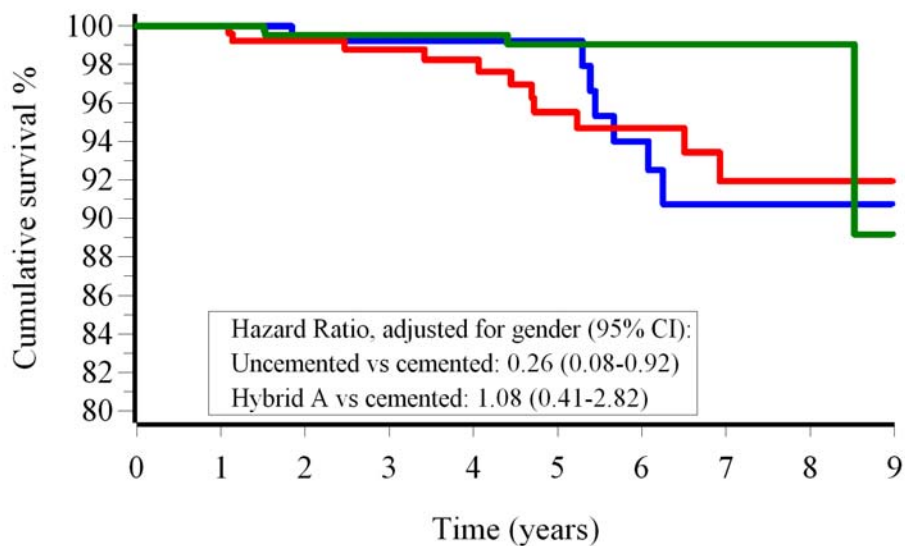
Age < 50 years, classified by type of surgery
End-point: 1st revision
(n= 2895)



Type — Cemented (n=386) — Hybrid A (n=747)
 — Uncemented (n=1746)

NB: Hybrid B (n= 16) not presented due to a small number of patients

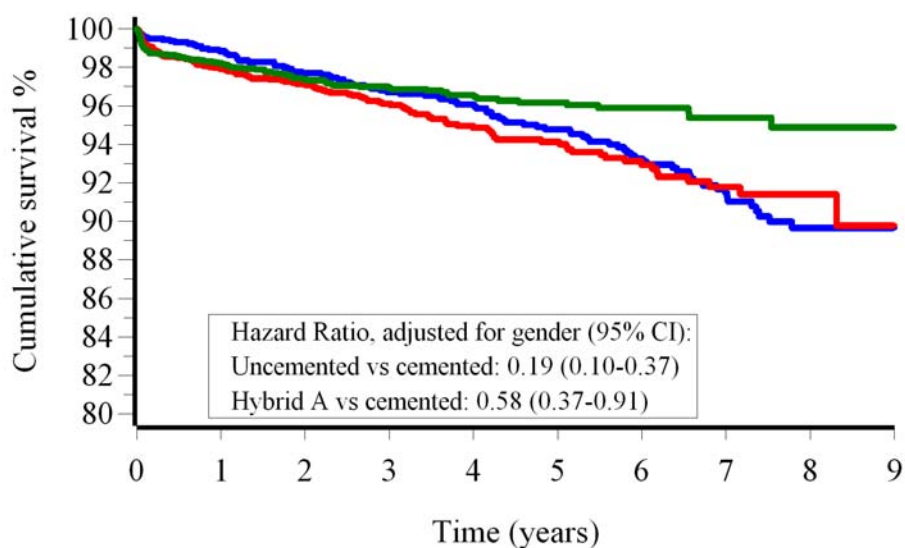
Age < 50 years, classified by type of surgery. Basic disease: primary arthrosis
End-point: Reason for 1st revision is aseptic loosening
(n= 1066)



Type — Cemented (n=151) — Hybrid A (n=282)
 — Uncemented (n=626)

NB: Hybrid B (n= 7) not presented due to a small number of patients

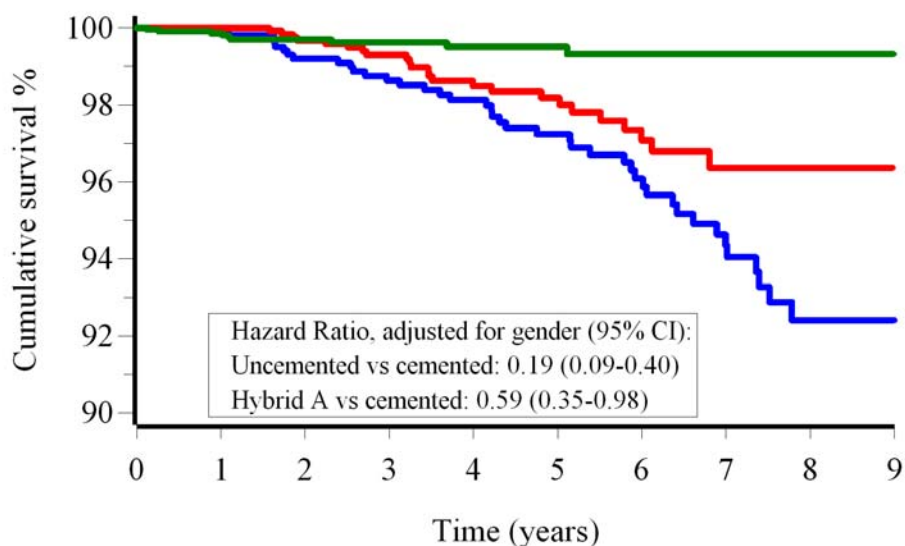
50 years \leq age < 60 years, classified by type of surgery
 End-point: 1st revision
 (n= 6929)



Type — Cemented (n=1608) — Hybrid A (n=2024)
 — Uncemented (n=3278)

NB: Hybrid B (n= 19) not presented due to a small number of patients

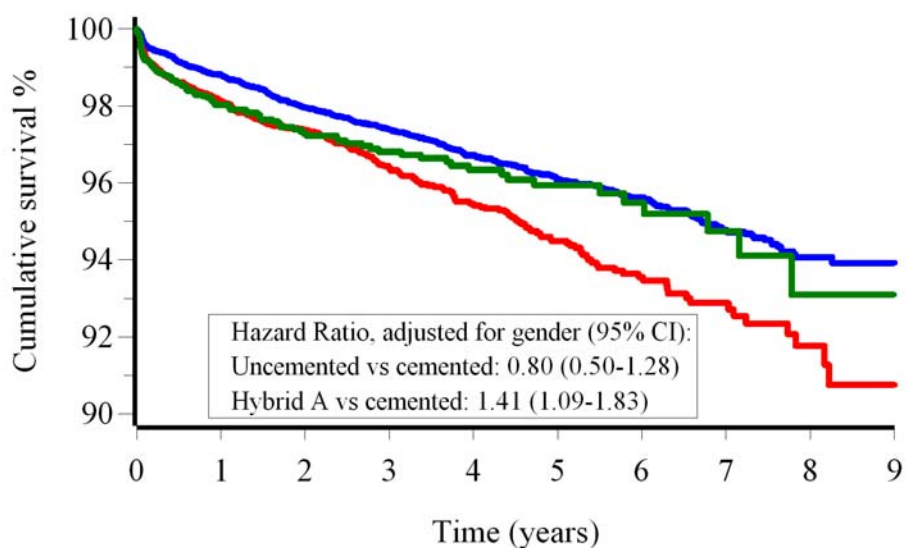
50 years \leq age < 60 years, classified by type of surgery. Basic disease: primary arthrosis
 End-point: Reason for 1st revision is aseptic loosening
 (n= 5115)



Type — Cemented (n=1160) — Hybrid A (n=1508)
 — Uncemented (n=2434)

NB: Hybrid B (n= 13) not presented due to a small number of patients

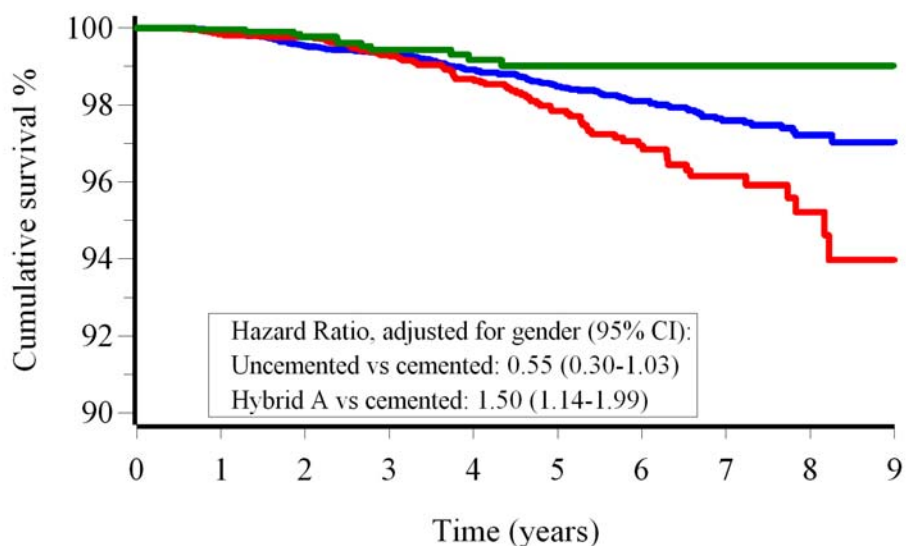
60 years \leq age < 75 years, classified by type of surgery
 End-point: 1st revision
 (n= 22387)



Type — Cemented (n=12141) — Hybrid A (n=6692)
 — Uncemented (n=3493)

NB: Hybrid B (n= 61) not presented due to a small number of patients

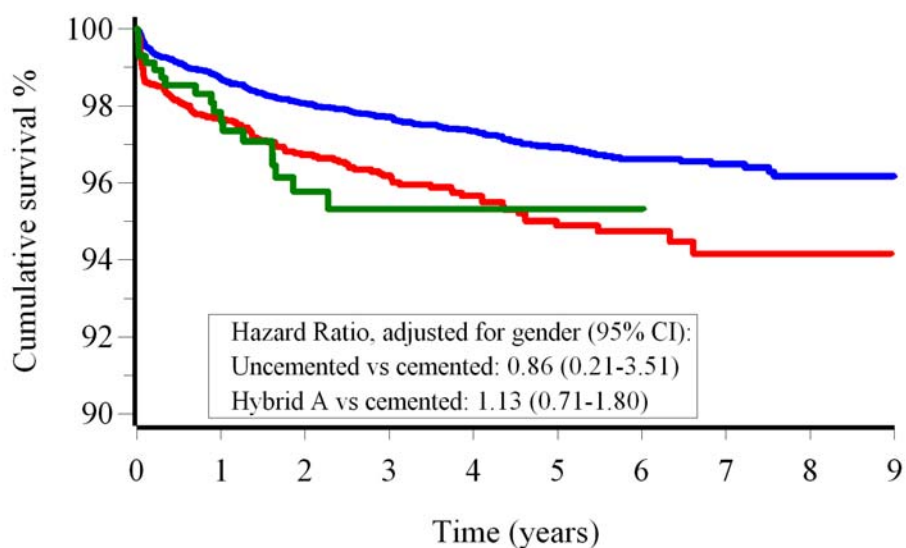
60 years \leq age < 75 years, classified by type of surgery. Basic disease: primary arthrosis
 End-point: Reason for 1st revision is aseptic loosening
 (n= 18659)



Type — Cemented (n=10050) — Hybrid A (n=5629)
 — Uncemented (n=2945)

NB: Hybrid B (n= 35) not presented due to a small number of patients

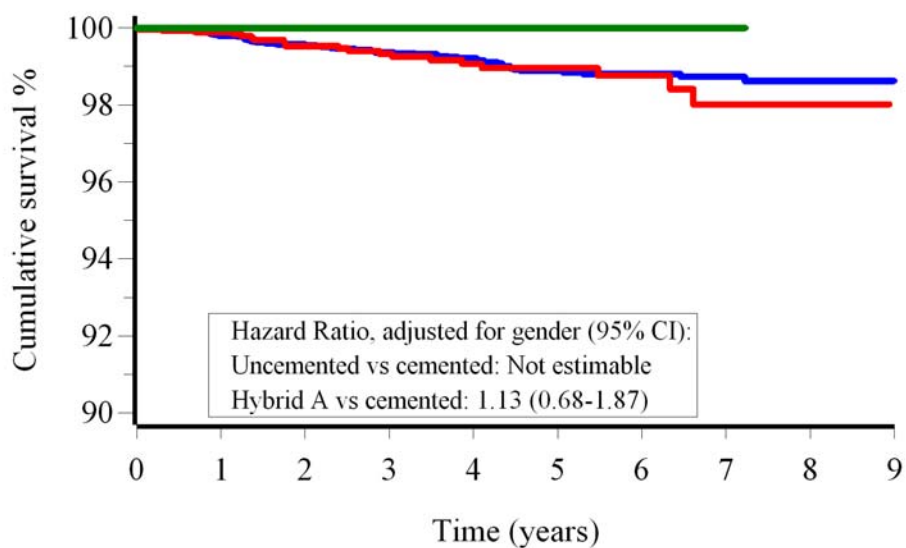
age \geq 75 years, classified by type of surgery
 End-point: 1st revision
 (n= 14904)



Type — Cemented (n=10516) — Hybrid A (n=3739)
 — Uncemented (n=577)

NB: Hybrid B (n= 72) not presented due to a small number of patients

Age \geq 75 years, classified by type of surgery. Basic disease: primary arthrosis
 End-point: Reason for 1st revision is aseptic loosening
 (n= 11415)



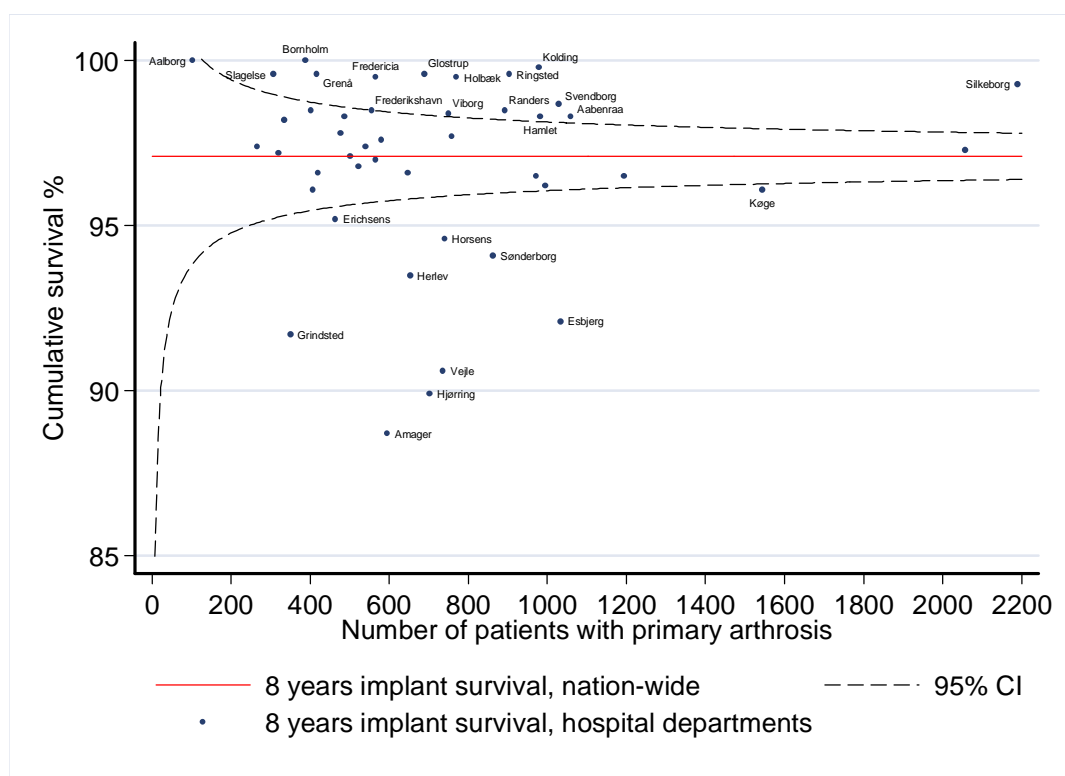
Type — Cemented (n=8119) — Hybrid A (n=2900)
 — Uncemented (n=386)

NB: Hybrid B (n= 10) not presented due to a small number of patients

Implant survival at participating departments
Primary arthrosis and aseptic loosening, 1995-2003

Departement	Periode	Antal	3 år	95%CL	5 år	95%CL	8 år	95% CL
Rigshospitalet	1995-2003	319	99.7	99.0 – 100	98.1	96.1 – 100	97.2	94.7 – 99.8
Amager hospital	1995-2003	595	98.6	97.4 – 99.6	96.8	94.8 – 98.8	88.7	77.4 – 99.9
Bispebjerg Hospital	1995-2003	972	99.0	98.3 – 99.8	97.4	96.1 – 98.7	96.5	94.7 – 98.3
Hvidovre Hospital	1995-2003	540	98.8	97.7 – 100	97.4	95.2 – 99.7	97.4	95.2 – 99.7
Frederiksberg Hospital	1995-2003	2056	99.3	98.9 – 99.8	98.9	98.3 – 99.5	97.3	95.0 – 99.6
Privathospitalet Hamlet	1995-2003	982	99.8	99.5 – 100	99.0	98.0 – 99.9	98.3	97.1 – 99.6
KAS Gentofte	1995-2003	647	99.4	98.7 – 100	98.7	97.6 – 99.9	96.6	94.6 – 99.3
KAS Glostrup	1995-2003	689	99.6	99.1 – 100	99.6	99.1 – 100	99.6	99.1 – 100
KAS Herlev	1995-2003	652	99.6	99.2 – 100	96.1	93.8 – 98.4	93.5	90.1 – 96.9
Erichsens Klinik	1995-2003	464	98.3	97.0 – 99.7	97.2	95.4 – 99.0	95.2	92.2 – 98.1
Hillerød Sygehus	1995-2003	486	98.5	97.4 – 99.7	98.3	97.0 – 99.5	98.3	97.0 – 99.5
Hørsholm Sygehus	2000-2003	973	98.5	97.4 – 99.7				
Roskilde Amts Sygehus i Køge	1995-2003	1544	99.2	98.6 – 99.7	98.5	97.6 – 99.4	96.1	92.5 – 99.7
Centralsygehuset i Holbæk	1995-2003	770	99.9	99.6 – 100	99.9	99.6 – 100	99.5	98.8 – 100
Centralsygehuset i Slagelse	1995-2001	306	100		99.6	98.8 – 100	99.6	98.8 – 100
Ringsted Sygehus	1995-2003	903	99.6	99.0 – 100	99.6	99.0 – 100	99.6	99.0 – 100
Centralsygehuset i Næstved	1995-2003	580	99.5	98.8 – 100	98.3	96.7 – 99.8	97.6	95.5 – 99.6
Centralsygehuset i Nykøbing F	1995-2003	758	98.8	97.9 – 99.7	98.3	97.1 – 99.4	97.7	96.1 – 99.3
Bornholms Centralsygehus	1995-2003	388	100		100		100	
Sygehus Fyn Svendborg	1995-2003	1028	99.6	99.1 – 100	99.6	99.1 – 100	98.7	97.5 – 100
Odense Universitetshospital	1995-2003	501	99.7	99.1 – 100	97.8	95.9 – 99.7	97.1	94.6 – 99.5
Sygehus Fyn Middelfart	1995-2003	1193	99.4	98.9 – 99.9	98.5	97.5 – 99.5	96.5	94.6 – 98.5
Sønderborg Sygehus	1995-2003	862	99.4	98.9 – 100	99.2	98.5 – 99.9	94.1	90.6 – 97.6
Haderslev Sygehus	1995-2003	521	99.0	97.9 – 100	98.1	96.5 – 99.8	96.8	94.3 – 99.3
Aabenraa Sygehus	1995-2003	1060	99.8	99.5 - 100	99.8	99.5 – 100	98.3	96.3 – 100
Sydvestjysk Sygehus Esbjerg	1995-2003	1033	98.0	96.9 – 99.1	95.9	94.2 – 97.6	92.1	88.4 – 95.8
Grindsted Sygehus	1995-2001	350	100		95.0	91.9 – 98.1	91.7	87.3 – 96.1
Fredericia Sygehus	1995-2003	566	99.5	98.9 – 100	99.5	98.9 – 100	99.5	98.9 – 100
Horsens Sygehus	1995-2003	740	99.0	98.1 – 99.8	96.5	94.8 – 98.2	94.6	92.2 – 97.0
Kolding Sygehus	1995-2003	979	100		99.8	99.5 – 100	99.8	99.5 – 100
Vejle Sygehus	1995-2003	736	99.3	98.5 – 100	97.2	95.3 – 99.0	90.6	85.2 – 96.0
Mølholm-Klinikken	1996-2003	518	100		100			
Holstebro Centralsygehus	1995-2003	994	99.1	98.4 – 99.8	98.3	97.1 – 99.4	96.2	93.5 – 98.9
Herning Centralsygehus	1995-2003	565	99.5	98.8 – 100	99.0	97.9 – 100	97.0	93.7 – 100
Silkeborg Centralsygehus	1995-2003	2189	99.7	99.5 – 100	99.5	99.1 – 99.9	99.3	98.7 – 99.9
Århus Sygehus, Nørrebrogade	1995-1999	265	98.4	96.8 – 100	97.9	96.2 – 99.7	97.4	95.3 – 99.5
Århus Sygehus, Tage-Hansens Gade	1995-2003	252	99.5	98.5 – 100	99.5	98.5 – 100		
Randers Centralsygehus	1995-2003	893	99.5	99.0 – 100	98.8	97.9 – 99.8	98.5	97.4 – 99.7
Odder Sygehus	1995-2003	401	99.6	98.9 – 100	98.5	96.7 - 100	98.5	96.7 - 100

Grenå Sygehus	1995-2003	416	100		99.6	98.8 – 100	99.6	98.8 – 100
Viborg Sygehus	1995-2003	750	99.2	98.4 – 100	98.4	97.1 – 99.7	98.4	97.1 – 99.7
Skive Sygehus	1995-2002	406	99.2	98.3 – 100	98.8	97.5 – 100	96.1	92.2 – 100
Thisted Sygehus	1995-2003	419	99.2	98.3 – 100	98.2	96.5 – 99.9	96.6	93.2 – 100
Aalborg Sygehus Syd	1995-2003	103	100		100		100	
Hjørring Sygehus	1995-2003	702	97.8	96.5 – 99.0	96.0	94.1 – 97.9	89.9	85.4 – 94.4
Farsø Sygehus	1997-2003	1579	99.7	99.4 – 100	99.4	98.8 – 99.9		
Frederikshavn Sygehus	1995-2003	555	99.7	99.2 – 100	98.5	96.8 – 100	98.5	96.8 – 100
Skørping Privathospital	1996-2003	161	100		100			
Frederikssund Sygehus	1995-2003	477	98.8	97.8 – 99.9	98.2	96.8 – 99.5	97.8	96.2 – 99.3
Helsingør Sygehus	1995-2003	334	99.4	98.5 – 100	98.9	97.6 – 100	98.2	96.4 – 100
Ringkøbing Sygehus	2002-2003	80						



Article and conference papers

Articles

1. Lucht U. The Danish Hip Arthroplasty Register. *Acta Orthop Scand* 2000; 71 (5): 433-439.
2. Pedersen A B. Johnsen S P. Overgaard S. Søballe K. Sørensen H T and Lucht U. Registration in the Danish Hip Arthroplasty Registry. Completeness of total hip arthroplasties and positive predictive value of registered diagnoses and postoperative complications. *Acta Orthop Scand*; 75 (4): 434-441.
3. Pedersen A B. Johnsen S P. Overgaard S. Søballe K. Sørensen H T. and Lucht U. Total hip arthroplasty. Incidence of primary operations and revisions 1996-2002 and estimated future demands. *Acta Orthop Scand*. In press.

Conference papers

1. Alma B. Pedersen. Søren P. Johnsen. Søren Overgaard. Kjeld Søballe. Henrik T. Sørensen. and Ulf Lucht. Incidence of total hip arthroplasties and revisions in Denmark between 1996 and 2002 and estimated future demands. 52. NOF Congress. Reykjavik. Island. Juni 2004.
2. P.Kjærsgaard-Andersen. Seven years follow-up results from the Danish Hip Arthroplasty Register: Outcome of using NSAIDs in prevention of heterotopic bone formation. Combined meeting between Icelandic Orthopaedic surgeons and anesthesists. Reykjavik. Island. Maj 2004.
3. P. Kjærsgaard-Andersen. S. Paaske Johnsen. A. Riis. U. Lucht. S. Overgaard & K. Jensen. Aseptic loosening of total hip arthroplasties after postoperative treatment with NSAIDs. DOS Congress. Hotel Scandinavia. Copenhagen. Oktober 2004.
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